The relationship between expertise and creativity

Computer-based music-making and the influence of instrumental music training

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From a theoretical perspective, expertise is in general considered a precondition for creativity. The assumption is that an individual needs to master the common and accepted rules and techniques within a certain knowledge-domain in order to create something new and valuable. Plenty of empirical documentation supports this hypothesis. However, real life cases demonstrate that this assumption may be too simple. Thus, occasionally people achieve great success as creative individuals without much expertise. Furthermore, empirical studies show that expertise sometimes inhibits creativity instead of promoting it.

Within the fields of music, digital technology, and young people, the implications of expertise are further disputed. First of all, it is a widespread notion that technology might obviate the need for basic skills. Naturally, such notions seem a bit simplistic. However, several studies indicate that novices, by the use of digital technology, are able to produce products that are considered highly creative. Furthermore, some studies conducted within the field of music and digital technology indicate that inexperience might sometimes entail explorative behaviour, whereas expertise entails less experimentation or even conventional thinking.

In the thesis the ambition is to investigate the ambiguities outlined in the above. Thus, the main question addressed is: *What is the relation between expertise and creativity within the context of music, technology, and young people?*

In the thesis, the relation between expertise and creativity is explored through a number of semi-experimental case studies within which musical novices and experts composed music by the use of computers. The final musical outcomes were evaluated among different groups of people. The study included two flexible phases within which hypotheses and design were developed and a third fixed phase within which the design and procedures were kept constant in order to secure comparability. The participants were recruited from University College Zealand, Little School of Holbæk, School of Rhythmic Music, and the Royal Academy of Music. The case studies were supplemented with field work and a design-based research project in order to investigate the main question within other substantive areas. These studies were conducted in a primary school and a secondary school in the
School of Tuse and the School of Vemmelev. Further, formal and informal interviews with professional composers and producers were conducted.

In the semi-experimental case studies the relation between creativity and expertise is investigated deductively and inductively. On the one hand, the ambition is to isolate expertise as a somewhat independent variable and test different hypotheses. On the other hand, the ambition is to study the field in an explorative way. Thus, the methodological approach in this thesis is essentially mixed and includes strategies derived from grounded theory, actor-network theory, design-based research, and experimental methodology.

The object of the research entails a number of complex questions related to culture, learning, intentionality, autonomy, consciousness, materiality, aesthetics, etc. Such issues are addressed through a theoretical framework based upon three main topics; creativity, expertise, and technology. Creativity is defined and demarked with reference to Mihaly Csikszentmihalyi, Margaret Boden, and Teresa Amabile, among others. Big-C and little-c creativity are discussed and it is argued that creativity essentially must be understood as individual and social constructions. Furthermore, different forms of creative processes are investigated and a distinction between blinded and sighted actions is constructed with references to scholars such as Robert Weisberg and Keith Simonton. Expertise is defined from an individual and a social perspective. Intuition, reflexion, and the dichotomy of mind and body are outlined and debated with inclusion of key theoretical terms such as reflection-in-action, tacit knowledge, and automated knowledge. References are made to Richard Sennett, Hubert Dreyfus, Donald Schön, Maurice Merleau-Ponty, and Michael Polanyi. Further, a social perspective on learning is outlined, mainly with reference to Etienne Wenger and the theory of communities of practise. The implications of technology are examined with the inclusion of actor-network theory, materiality, and the theory of affordance. It is suggested that creativity must essentially be understood as a phenomenon distributed in networks. Furthermore, a seeming affinity between theories of creativity and the design of digital interfaces are identified, primarily with respect to Koestler’s theory of bisociation and Donald Campbell’s theory of blind-variation and selective-retention.

The analysis is based upon the theoretical framework outlined in the sense that creativity is investigated as an individual as well as a social phenomenon. Thus, on the one hand the
participants’ idiosyncratic perspective on products and processes is examined. On the other hand, the evaluation-groups’ assessments of the musical products are investigated. The empirical material includes video-observations, screen-recordings, screen-shots, individual interviews, group interviews, questionnaires and the produced music. The comprehensive amount of empirical data enables a detailed investigation of creativity as well as a subtle examination of individual and social constructions of concepts such as originality, quality, intention, and autonomy.

Generally, the analysis indicates that novices and experts are all equally capable of making music that is considered creative. Moreover, the study shows that the music of the novices often breaks with musical norms whereas the music of the experts is more in line with musical traditions. However, the study also demonstrates that expertise is important in a creative process for several reasons. First of all expertise provides a comprehensive amount of knowledge and knowhow that may be combined or developed in many different ways leading to many different results. Secondly, expertise provides the tools by which specific goals can be reached. Thirdly, expertise provides techniques that may help meeting acquirements of value and craftsmanship. Finally, expertise provides competences in order to form a creative product according to the codes and signs within specific knowledge domains. However, expertise might also lead to an entrenched perspective, in the sense that knowledge and experience may work as a path into the well-known rather than into the unknown. This limited perspective may be caused by sighted reflective processes, including master plans, strategies, choices of musical form and genre, etc. Further, intuitive thinking and tacit knowledge connected to routines, former knowledge, and automated skills may reinforce this limited perspective. Finally, communities of practice might promote reproduction instead of production.

In line with the above, the thesis demonstrates that creative processes rely on some degree of blindness. Thus, mistakes seem to occupy a crucial place in the investigated case studies. This finding may result in provocative conclusions regarding the relation between creativity and expertise: Most importantly, the expert’s total control in the form of technical skills seems to be an obstacle in the sense that control limits the chances of mistakes. Thus, lack of expertise may promote creativity in the sense that lack of skills and knowledge entails lack of control. In line with this argument, the study indicates that experts often intentionally put themselves in situations within
which their control is minimized in order to promote blindness. In such cases reflective thinking seems to be the main dynamo rather than intuition.

Creative processes are addressed in the thesis partly as an individual phenomenon and partly as a phenomenon unfolded in networks. According to the last mentioned perspective, the autonomy of the subject engaged in creative processes may be questioned in the sense that the subject is influenced by other subjects (i.e. other human actors) and material (i.e. non-human actors). Thus, the creative subjects depend on digital technology as well as musical instruments. However, the thesis demonstrates that this relation is not stable: Sometimes, the subject seems much influenced by non-human actors and at other occasions the subject seems to act more autonomously. From the perspective of the composers, the reliance on musical software is in general associated with lack of autonomy whereas the reliance on musical instruments is associated with high autonomy. Hence, even though digital software allows the novices to produce music considered creative by social groups, the novices themselves do not necessarily agree in the sense that they do not feel as though they are the genuine autonomous creators. However, this notion about different levels of autonomy might not be appropriate in the sense that the use of traditional musical instruments also entails a reliance on different human and non-human actors. Thus, the main research question cannot be answered unambiguously, but depending upon how the interrelation between the subject and the surrounding world is interpreted and classified.
Dansk resumé

I følge hovedparten af kreativitetsteoretikere er ekspertise en forudsætning for kreativitet. Tanken er, at det kreative individ må kende samt mestre teknikkerne og koderne inden for et kundskabsområde for at kunne skabe noget nyt. Argumentationen understøttes af omfattende mængder af empirisk dokumentation. Ikke desto mindre er forestillingen udfordret fra flere kanter. For det første viser real life cases, at novicer til tider skaber noget, der opfattes som kreativt i sociale fora. For det andet demonstrerer en række studier, at ekspertise kan begrænse kreativitet.


Med udgangspunkt i det beskrevne problemfelt er omdrejningspunktet for afhandlingen følgende spørgsmål: Hvad er relationen mellem ekspertise og kreativitet inden for området unge, musik og teknologi?

Relationen mellem ekspertise og kreativitet er undersøgt via en række semi-eksperimentelle casestudier, hvor novicer og ekspert komponerer musik ved computere. De færdige kompositioner vurderes af en række evalueringsgrupper. Undersøgelsen inkluderer to fleksible faser, hvorunder hypoteser og design udvikles, samt en afsluttende stabil fase, hvor procedure og design fastholdes uforandret med henblik på at understøtte muligheden for sammenligning. Deltagerne er rekrutteret fra University College Sjælland, Holbæk Lilleskole, Den Rytmiske Højskole i Vig og Musikkonservatoriet. Casestudierne suppleres med feltarbejde og et enkelt design-based research projekt med henblik på at undersøge det centrale spørgsmål indenfor forskellige områder. Disse
studier udføres i indskolingen og i mellemtrinet i Tuse Skole og Vemmelev Skole. Yderligere interviewes en række professionelle komponister og producere.


I analysen tages afsæt i den skitserede teoretiske ramme i den forstand at kreativitet undersøges som et individuelt såvel som et socialt fænomen. Således undersøges på den en side deltagernes eget


I afhandlingen er kreative processer adresseret dels som et individuelt fænomen og dels som et netværksbaseret fænomen. Ifølge det sidstnævnte perspektiv kan der stilles spørgsmål ved graden af subjektets autonomi i kreative processer i den forstand, at subjektet er forbundet med andre
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Chapter One: Introduction

1.1 The research question

In this thesis the ambition is to explore the relationship between expertise and creativity. Naturally, this question is too broad, abstract, general, and simplistically articulated. Further, the question in this form might indicate that an unambiguous and universal causal relationship is suggested to exist between these two factors. This is not the intention. Rather, the aim is to explore the implications of expertise in a specific context within which creativity unfolds. Accordingly, the question calls for a specific context, frame, and situatedness.

The question is addressed explicitly within the domain of technology, music, and youth culture. There are several reasons for this. Firstly, I have personal and professional experience within that specific domain. Secondly, the role of expertise seems more uncertain and disputed within the context of aesthetics, technology, and youth culture (Folkestad, 1996; Sefton-Green, 1999, 2011; Manovich, 2001; Buhl & Hemmingsen, 2004; Bærendsen, Jessen & Nielsen, 2009; Banaji, 2011; Pennycook, 2011). However, even though a specific domain is chosen, I must still confess that my interests go beyond a limited investigation of single cases, and that I hope that the outcome of this thesis might also be relevant within other domains. Therefore, it is reasonable to say that the question is born with a particular as well as a general perspective, and that the thesis is consequently stretched out between these two positions and objectives. In other words, I am exploring specific situated cases, but I am still connecting these cases to general discussions on expertise and creativity. Thus, the main question is:

What is the relationship between expertise and creativity within the context of music, technology, and youth culture?

The question contains an infinite amount of problems: What is expertise? What is creativity? Can it be measured? Is it reasonable to assume a relationship between these two phenomena? All these questions will not be answered in this chapter. However, in the following sections I will seek to unfold the personally, theoretically and empirically derived motivations for that specific question. Further, I will discuss the question’s relatedness to trends and discourses in contemporary times.
Finally, I will briefly present and discuss the applied methodological approach, research position, chosen design, and structure of the thesis.

1.2 Personal background and motivation for the research

Since the notion of truly objective science lost its privileged position, at least within the fields of sociology and the humanities, it has been a common suggestion that the researcher must explicate and reflect upon their own subjective role and interests as a researcher (Haraway, 1991; Bourdieu, 1994; Clarke, 2005; Latour, 2005). In this thesis, this very principle is taken quite seriously. Thus, my own personal approach to the field will be treated as an important resource rather than an unpleasant bias. Consequently, the personal background behind the research objectives is placed in the first section of this chapter instead of the end.

Naturally, a story about the researcher’s personal background might be a construction designed to fit the thesis in a suitable way. I remember I once heard a man saying something like ‘even when I am truly honest I get discovered’. To me such a statement indicates that the border between truth and untruth is rather blurred. In my narrative about myself as a researcher, I naturally present a construction. You cannot just ‘tell the truth’. The truth is formed by the purpose, the circumstances, the intention, the strategy, the form, the media, etc. of the way in which it is told (Denzin, 1999, pp. 312-313). However, you can still try to be as reflective and honest as possible. In other words, science might be a construction, but there still might be a difference between a good construction and a bad one (Latour, 2005, p. 146).

1.2.1 The story about myself and the construction of the research question

When I was a boy, I was a dreamer. I was dreaming about becoming a famous star. I took guitar lessons from the age of nine. I seldom practised. Instead I made songs. I recorded the songs with a cheap tape recorder. When the music didn’t sound like it did inside my head, I blamed the equipment. I listened to Davie Bowie, the Cure, Prince, Michael Jackson, Duran Duran, etc. To me, such stars were not only extremely talented and gifted. Rather, they were like demi-gods. They somehow had the ability to create magic; songs, which would last forever; invisible musical metaphysical stuff that could not be broken; the gold of the gods. I played in several bands and I created music 24/7, always chasing the brilliant idea.
In high school I studied music as well. Besides playing guitar I now sang and played the piano, classical music as well as popular. I practised a lot, but had no real talent for the instruments. I had problems acquiring comprehensive technical skills. However, I still made songs. I was working on new songs effortlessly, constantly, at every possible opportunity. I was constantly chasing the magical musical gold. I wrote several choral pieces. The music was sung by the local high school choir. I remember particularly a specific piece of choral music I composed in only thirty minutes. I felt confident, that I had a special talent that somehow enabled me to pick up extraordinary ideas from the world beyond, like Mozart, or Handel.

After high school I studied at a music academy full-time for one year. On one occasion the music teacher was not present, so my fellow students and I decided to play some of my songs. Later, when he returned, he told me that the bass had to be played simultaneously with the kick drum. I was choked by this rule-based approach to music. At the academy I met other students that were more technically accomplished on their instruments than me. I found it frustrating. I considered myself to be the most talented student without question. However, it was not easy to occupy this position. In the ordinary music lessons, I was an average student, on a good day. Still, when working with composition and songs I gained reasonable success. I developed an ambivalent relation to skills and teaching. On the one hand, it was rather obvious that skills could help me gain the proper position and recognition in the community and also help me to communicate my musical ideas in a reasonable way. On the other hand, I felt that the focus on skills was demotivating: first of all, because my talent for instruments was limited; second of all, because I felt that skills led to imitation rather than originality.

Next, I studied music at the university. I practised for many hours every day. I found sight singing and piano-playing difficult. Apart from rhythmic tasks, I felt that I had no talent for basic musical exercises. Instead I received a lot of credit for my talent as a conductor. As an absolute leader in control, I succeeded. At the university my fellow students and I learned a lot. We were taught music history, piano-playing, singing, conducting, composition, music analysis, research methodologies, and so on. However, in general I did not feel that my time at the university promoted my creative ability. Furthermore, when I looked at my fellow students it seemed sometimes as if the environment at the university was almost counterproductive. Quite a lot of my university friends
continuously scaled down the level of their ambition. Students that initially had had great personal ambitions became increasingly humble with respect to the tradition and the recognized masters. ‘I can never be as good as him’, they suddenly reasoned. They became solid imitations, but lost their dreams of contributing to the world in an original way.

During university I played in several bands. We only played my music. I wrote down rather specifically what I expected them to play. From my perspective, the result would obviously be most successful if they followed my instructions in every detail. According to myself, the materialisation of my inner vision was the main criteria of success. We played concerts primarily in Copenhagen. Eventually the bands and I broke up. I think they grew tired of my constant attempts to control. And I grew tired of trying to persuade the members of the bands that I ought to be in control. Instead I started working with computers. I could control every musical detail and I could work with endless musical instruments and musical layers. Accordingly, my creativity – so I reasoned – didn’t have to be limited by a specific band orchestration. I could now truly materialize my inner musical vision. The music I composed and produced was played on the radio and I was interviewed on several occasions. To me this proved that the materialisation of my inner visions was the true key to genuine creativity. However, I also discovered that unexpected interactions with the computer sometimes led to the birth of interesting and unforeseen musical ideas.

After university I conducted choirs for many years. At first, I fitted quite well into this environment. In classical choirs it is quite common that the members of the choir follow the conductor’s instructions in every aspect. Furthermore, the singers generally expect the conductor to be absolutely despotic. Thus, the members admired me for my despotic and uncompromising nature. However, eventually I grew tired of the position of the absolute master in control. What if some of the members of the choir had a better idea than I? Couldn’t we share some of the power and control? It was a constant pressure to uphold the dominating position and hide possible weaknesses.

Subsequently, I began to teach music at the Social Education (University College Zealand). Gradually I became more interested in pedagogical issues. Thus, eventually, I studied learning and sociology at the Danish University of Pedagogy and began teaching pedagogics, learning theory, and sociology. However, in the music lessons I was rather preoccupied by how to facilitate creativity among my students. I introduced computers and music software and began working with
composition in different ways. This choice was of course promoted by my former experience within this field. However, another reason was the fact that the number of music lessons was constantly reduced. Hence, it was not really possible to teach the students instrumental skills (Boysen 2010d). If I wanted to help the students create music, I had to use digital technology.

Most of my students had no prior experiences within the field of music in the sense that they did not know how to play any musical instruments. However, in most semesters there were always a minor group of students that had been playing music for many years. This gave me an opportunity to compare the creative strategies of novices and experts. I was rather fascinated by what I saw. Firstly, I found that many of the experienced students were trying to use the computer as a tool to materialize a specific musical idea (in the same way that I had in the past). Quite often this attempt failed in the sense that the composer could not find the specific sound that she or he had in mind. They also seemed resistant in terms of moving in new directions and experimenting with the computer software. Secondly, I found that many of the novices did not have any specific musical plan or idea. Instead it seemed like they were experimenting and interacting more explicitly with the computer. For instance, they did not look for a specific sound in the same way as the experts did. However, the novices’ compositions were quite often evaluated more positively than the music composed by the experts.

1.2.2 The point of the story

Now, this is the story about my musical ‘career’ as I chose to present it. There are several points I find important in regard to the present investigation. First of all, the story tells something about my own approach to skills and practising. I seldom made a positive connection between skills and creativity. To me, acquiring skills was just an annoying necessity that had to be dealt with. Primarily, skills became something of an enemy in terms of my own creativity. People with substantial skills appeared sometimes conservative and non-creative. Teachers in general taught me rules I felt were counterproductive in regard to creativity. I felt that my fellow students became less creative because of their increasing humbleness towards the ‘masters’. Finally, my own lack of skills prevented me from materialising my inner musical visions. Thus, my approach to skills was rather ambivalent. You might say that I was even a bit angry at skills.
The story also tells us something about shifting approaches to the nature of creativity. As a young boy I was influenced by romantic notions of creativity, according to which a creative person has some extraordinary contact to the world of the gods, the world of ideas, the world of truth, etc. (see also Boysen 2009a, 2009b, 2009c, 2009d, 2010a). The romantic artist is first of all a medium. Thus, according to the romantic philosopher Schopenhauer, the composer ‘reveals the innermost nature of the world, and expresses the profoundest wisdom in a language that his reasoning faculty does not understand’ (Schopenhauer, 1818/1966, p. 260). First, this means that the notion of creativity is highly bound to the individual. In other words, creativity is something that takes place inside a single person. Secondly, it means that questions of skills are once more suspended. The romantic artist grasps something that is ‘out there’. Skills may be acquired by anyone. Accordingly, skills do not play the essential role in regard to the establishment of the extraordinary genius.

Later in my life my approach to creativity changed. The focus on the isolated individual was replaced with notions of coincidence and networking. I began to understand creativity as the result of interaction between people and machines and unexpected events. Suddenly creativity was not something that was necessarily embedded in one individual. Creativity had no obvious centre. Creativity was equally the result of coincidence and unexpected interactions.

Finally, the story expresses something about a person who was ambitious and wished to make a footprint in the world. This might also influence on the present research in a more general way. Naturally, most researchers hope to make some interesting new discoveries. In this research I explore the relationship between expertise and creativity. Accordingly, one of my motivations to follow this question is that the majority of researchers within this field claim that expertise is an important precondition for creativity. Thus, if I can question such statement, I can contribute with something novel. Naturally, such a finding is not guaranteed. Actually, there might be a reasonable chance that the result will be a confirmation of previous assumptions. Accordingly, during the process of research I left behind my ambition of coming up with some new and extraordinary results rather early on. In other words, I continuously try to discipline myself not to let personal ambition drag my investigation in the wrong direction.

To sum up, the present investigation is intertwined with my personal experiences, values, reflections, competencies, etc. Such a background forms my perspective on the world and some of
the working hypotheses in the investigation. In the present research, the aim is to use such a platform and still be able to move in new directions. Thus, I might have developed hypotheses about expertise and its relation to creativity, but that doesn’t mean that I can’t be pushed in new directions during the present investigation. Skills might have been my enemy in some phases of my life, but that doesn’t mean that skills are the enemy in this thesis.

1.3 Theoretical and empirical ambiguities

As demonstrated above, there are personal reasons behind the construction of the research question. However, the question addressed is equally intriguing and relevant because there seem to be a number of contrasting positions and results in the field. In other words, whilst most researchers agree that expertise is a necessary and important part of creative processes, some findings and indicators point in other directions. Further, theoretical suggestions about creativity seem to contain some ambiguities concerning the role of expertise.

1.3.1 Expertise and creativity: You have to practice for at least ten years…

A person cannot be creative in a domain to which he or she is not exposed. No matter how enormous mathematical gifts a child may have, he or she will not be able to contribute to mathematics without learning its rules.

(Csikszentmihalyi, 1996, p. 29)

In the majority of creativity theory, expertise and practise is considered essential for creative expression (e.g., Gardner, 1993; Csikszentmihalyi, 1999; Sternberg, 1999). Empirical implications supporting this assumption are substantial and can, for example, be found in Howard Gardner’s biographical study of recognized creative individuals, such as Freud, Einstein, Picasso, Stravinsky, etc. (Gardner, 1993). Furthermore, it is a predominant notion that the individual must practice for at least ten years before being able to produce anything truly original and valuable (Ericsson, 1996). For instance, Gardner and Policastro argue that even Mozart, ‘who was a child prodigy from an early age, had been composing for at least a decade before he could regularly produce works that are considered worthy of inclusion in the repertoire’ (Gardner & Policastro, 1999, p. 216). A similar conclusion is found in Robert W. Weisberg’s biographical study of Mozart and the Beatles etc.
(Weisberg, 1999). Researchers and theorists preoccupied by creativity from an everyday perspective (little-c creativity, see Chapter Four) adopt a similar approach to expertise. Not in the sense that the individual need ten years of practise, but in the sense that creativity relies heavily on expertise. Researchers like Amabile (1996) and Craft (2005) represent such a perspective.

*The domain provides a knowledge context within which to be creative. This means that teachers need to be sufficiently knowledgeable of the subject domain to bring learners to the edge of their knowledge, and to enable pupil creativity within the domain.* (Craft, 2005, p. xx)

Further, pedagogical literature, preoccupied by questions of aesthetics and creativity, present the same basic understanding of the crucial role of expertise (Ankerstjerne, 2004; Astring & Sørensen, 2006; Fredens, 2006). For instance Malcolm Ross points out that:

*The children* need the craftsmanship that will enable them to manipulate media and associated technology with ease and precision; without such skills they must feel themselves inhibited rather than liberated by media. Lacking effective control, they will never be carefree enough to play with media imaginatively or to improvise; both these activities are achieved only after the groundwork has been properly done. (Ross, 1978, p. 69)

### 1.3.2 The general viewpoint challenged

This general and well-documented viewpoint, presented in the above, is however challenged in a number of ways. Hence, according to some findings there sometimes seem to exist a reverse relation between creativity and expertise. Accordingly, some researchers propose that expertise might also inhibit creativity.

*Concerning knowledge, on the one hand, one needs to know enough about a field to move it forward [...]. On the other hand, knowledge about a field can result in a closed and entrenched perspective, confining a person to the way in which he or she has seen problems in the past.* (Sternberg, 2003, p. 107)

Several studies imply that expertise sometimes inhibits creativity and flexible thinking. In a statistical investigation conducted by Simonton, the correlation between creativity and formal
education is examined (1984). Simonton concludes that people, regarded as creative within a specific domain, are neither highly educated nor un-educated, but rather something in between. Further, French and Sternberg examine relationships between expertise and flexibility and conclude that expertise might, in a certain context, inhibit flexible thinking (Frensch and Sternberg, 1989). Naturally, both of these investigations can be criticized in a number of ways. Simonton might be confusing cause and effect, and the suggestion that flexible thinking indicates creative thinking might be questioned. Still, such investigations imply that the relation between expertise and creativity is not simple or straightforward.

The relation between expertise and creativity seems even more unpredictable when it comes to the field of music and the field of aesthetics in general. A number of studies have been conducted to examine children's long-term development in terms of creative competence within a variety of aesthetic domains. Some of these studies indicate that development of creativity is not a linear process related straightforwardly to the development of expertise. Instead, such studies imply a sort of U-graph, according to which the young children demonstrate a comprehensive amount of creative skills whereas the children in primary and secondary school demonstrate a reduced amount of creative skills. Finally, a comprehensive amount of creative skills are detected among adults who engage regularly in creative processes. According to these studies, the early years are characterized by play and freedom whereas the school years are characterized by conformity (Gardner & Winner, 1982; Albert, 1997; Keegan, 1997; Runco & Charles, 1997). Gardner suggests that this may be related to the fact that the child gradually becomes more aware of the codes that belong to different domains of knowledge (Gardner & Winner, 1982, p. 100). From this perspective, the adaption of knowledge and skills will inhibit creativity during a certain period of time until the knowledge and skills are learned (or internalized). Subsequently, the subject will be able to perform creatively through the use of the domain-specific signs, rules, and forms.

Within the field of digital technology the main suggested relation between creativity and expertise seems equally challenged. First of all, the notion that technology might obviate the need for basic skills seems widespread (see Chapter Nine). Even though such a notion is problematic, there are several studies that indicate that lack of basic skills might not be significant in a creative process incorporating the use of digital technology (Sefton-Green 1999; Manovich 2001; Buhl & Hemmingsen, 2004). Likewise, a number of studies specifically engaged with music and
technology support that suggestion (Scripp et al., 1988; Folkestad, 1996; Webster, 1990; Hickey, 2003, 1995a, 1995b; Seddon & O’Neill, 2003). Some of them indicate that inexperience might sometimes lead to explorative behaviour, whereas expertise might rather lead to less experimentation or even conventional thinking.

This point of view is also represented within the field of music and pedagogics in general. Maud Hickey is one of the researchers that discusses this apparently ambivalent relation between expertise and creativity,

Domain-relevant skills in the case of music composition, however, can have adverse effects on creativity. For example, I have discovered that experience can sometimes act as a detriment to creative outcomes, as in the case of young student composers who have had several years of piano lessons. Their C-major tonal focus and strong scalar/arpeggio approach to the piano becomes predominant in their compositions, and little chromatic or nontonal experimentation takes place [...]. The influence of music aptitude, achievement, and experience on the creative quality of children’s music compositions requires much further research. (Hickey, 2003, p. 40)

1.3.3 Theoretical ambiguities
A number of theoretical models have been developed in order to understand and conceptualize the essential elements of creative processes. In the majority of creativity models, expertise is explicitly considered a precondition for creativity, e.g. in Amabile’s componential model and in Csikszentmihalyi’s system-model. However, creativity models might also point in other directions. First, experimentation and explorative behaviour is given a key role in many models of creative processes (Webster, 1987; Amabile, 1996; Hickey, 2003; Seddon & O’Neill, 2003). Needless to say, it is of course perfectly possible to be explorative as an expert. However, some studies indicate that explorative behaviour is more common among novices (Scripp et al., 1988; Folkestad, 1996; Weisberg, 1999; Seddon & O’Neill, 2003). Secondly, according to the theory of combinatorial creativity, the association or bissociation of very different domains/ideas are crucial in a creative process (Koestler 1964; Weisberg & Hass, 2007; Simonton, 2010a). In this respect, some studies indicate that the combination of very different domains is more common among novices (Weisberg, 1999). Third, according to the theory of blind-variation and selective-retention creativity relies on
some degree of blindness. In this respect, it might be suggested that novices, rather than experts, are more likely to engage in relatively blind processes (Simonton, 2007a; Christensen & Schunn, 2009) (see Chapter Five).

1.3.4 Anecdotal cases

Finally, a number of more or less well-known cases might challenge unambiguous assumptions about the necessity and impact of expertise. Consider the following examples. (1) In 1998 a five year old Danish boy named Vitus painted some pictures while he was at kindergarten. The pictures were sent anonymously to one of the museums of modern art in Denmark. The paintings were accepted, in spite of substantial competition among the different artists (Fugl, 1998). (2) In the 1960s, three sisters without any musical training and without any traditional musical skills started a band called The Shaggs. In 1969 they released the album Philosophy of the world, which led to the band being admired by famous artists such as Frank Zappa and Kurt Cobain. The music magazine Rolling Stones has on several occasions highlighted the album and stressed its significant role in the alternative music community (Cross, 2013, p. 21). (3) In 1995, the Danish film-director Lars Von Trier launched the ten dogma rules. The point was to make the director think in new ways, partly without the deployment of basic routines and basic technical skills. For instance the director was forced to leave aside effects such as lighting, additional sound, etc. One of the outcomes of the project was the movie The Celebration, directed by Thomas Vinterberg, which has won several awards (Qvortrup, 2006). (4) The Danish composer and piano player Henrik Balling, founder of the popular band Gangway, explained on the music program PULS how he comes up with new musical ideas. According to Balling, a new idea is often based on a mistake rather than flawless piano-playing. Thus, playing a wrong note may somehow promote the emergence of new ideas. (5) In 1988, the famous band R.E.M. released their album, Green. During the recordings, the band-members had chosen to switch instruments in order to break out of established norms and routines. According to the band-members, this method contributed to the quality of the album (Halbersberg, 1988).

Naturally, the anecdotal cases just presented might be interpreted in a number of ways. Still, it is reasonable to ask questions like: Why is it that expertise sometimes seemingly must be avoided in order to promote creativity? Why is it that obviously inexperienced people sometimes appear highly creative? Why is it that mistakes sometimes entail creativity? Obviously, these questions can’t be
answered in any simple generalized terms. The differences between the domains of literature, painting, mathematics, football, music, etc. are substantial. The curious incident with the painter Vitus would probably not have happened in the context of mathematics. On the other hand, there might be some general implications and questions hidden in these anecdotal stories. Accordingly, the stories about Vitus and The Shaggs might lead to questions such as: who decides what is creative and what is not? Can creativity be objectified? Does an autonomous creator need to have an intention? Similarly, the stories about Henrik Baling, R.E.M., and the dogma rules lead to questions such as: what is the relationship between body and mind? Is creativity something that happens in the body or the mind? Is creativity connected to the process of thinking?

1.3.5 The complexity of the addressed question
In the above, the role of expertise is questioned empirically, theoretically and anecdotally. Empirically, there seem to be some ambiguities concerning the relationship between expertise and creativity. Further, such inconsistencies are apparently acknowledged by some of the main researchers within the field of creativity. From a theoretical perspective, there seem to exist notions about creativity that lead to ambiguous answers in terms of the implications of expertise. From an anecdotal perspective, single cases imply that the relationship between expertise and creativity is complex and inconsistent.

In the light of the above, there seem to exist at least three basic notions about the connection between creativity and expertise:

- You have to know the rules in order to change the rules. You have to learn to handle the tools before you can produce anything creative (Gardner, 1993; Amabile, 1996; Csikszentmihalyi, 1999)
- Knowledge about a field might result in an entrenched perspective (Simonton, 1984; Hickey, 2003; Sternberg 2003)
- Digital technology enables people to be creative without having to learn basic craftsmanship (Scripp et al., 1988; Webster, 1990; Folkestad, 1996; Seddon & O’Neill, 2003; Hickey, 2003).

Naturally, the point is not to argue that one of these notions is correct in any simple terms. Rather, the point is to demonstrate the complexity of the main research question. In other words, the
question addressed in this thesis is more complicated than an isolated discussion of two related concepts. When examining the relation between creativity and expertise, other questions arise that implicate different epistemological and ontological approaches to the nature of culture, sociality, individuality, learning, technology, society, communication, aesthetic, originality, quality, autonomy, etc. Thus, in the thesis the ambition is to address the main question from several angles and include a broad spectrum of perspectives.

1.4 The methodological framework

The methodological framework is discussed in chapters two and three. However, in the following section the study design is presented in brief.

1.4.1 Design and method

The relation between expertise and creativity is explored through a number of semi-experimental case studies within which musical novices and experts compose music through the use of computers. The final musical outcomes are evaluated among different groups of people. The study includes two flexible phases within which the hypotheses and design are developed, and a third fixed phase within which the design and procedures are kept constant in order to secure comparability. The participants are recruited from University College Zealand, the Little School of Holbæk, the School of Rhythmic Music, and the Royal Academy of Music, all in Denmark.

The three phases of the case studies form the main part of the study. However, the case studies were supplemented with field work and a design-based research project in order to investigate the main question within other substantive areas. These studies were conducted in primary and secondary schools in The School of Tuse and The School of Vemmelev. Further, three formal and two informal qualitative interviews with professional composers and producers were conducted.

In the semi-experimental case studies the relation between creativity and expertise is investigated in a deductive as well as in an inductive manner. On the one hand, the ambition is to isolate expertise as a somewhat independent variable and test different hypotheses. On the other hand, the ambition is to study the field exploratively. Thus, the methodological approach is essentially mixed and
includes strategies derived from grounded theory, actor-network theory, design-based research, and experimental methodology.

<table>
<thead>
<tr>
<th>Table 1.1 The mixed approach</th>
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<tbody>
<tr>
<td>Research approaches inspired by experimental methodology</td>
<td>Research approaches inspired by qualitative and explorative methodologies (grounded theory, design-based research, actor-network theory)</td>
</tr>
<tr>
<td>A number of hypotheses are constructed and tested systematically</td>
<td>An explorative approach to the produced data is applied</td>
</tr>
<tr>
<td>Participants are given specific tasks</td>
<td>The specific tasks are supplemented by processes primarily triggered by the participants idiosyncratic motivations and visions</td>
</tr>
<tr>
<td>The attempt is to isolate ‘expertise’ as a specific factor</td>
<td>The attempt to isolate ‘expertise’ as a determinant factor is combined with an open qualitative approach to the participants and their competencies</td>
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</table>

1.4.2 Assumptions and definitions

The study design is based on several assumptions. First of all the reason for choosing music, technology, and youth culture as the main frame is partly related to assumptions about the characteristics of this specific field. Next, the study design is based on a specific way to categorize and measure the two main concepts in the thesis: creativity and expertise.

1.4.2.1 The reason for choosing music, technology and youth culture

In this thesis, the aim is to challenge and explore the most common assumption about expertise and creativity, suggested by Csikszentmihalyi among others. Therefore, I focus on the fields and domains within which the level of ambiguity seems relatively high. In other words, instead of focusing on the grand old masters and traditions within mathematics or classical music (Gardner, 1993; Csikszentmihalyi, 1996), I focus on contemporary music, technology, and youth. Thus, the choice of focus is caused by three hypothesis based partly on empirical evidence and partly on theoretical assumptions, as outlined in the section 1.3:

- Music is chosen because it represents a knowledge domain within which rules are constantly bended and negotiated, at least within a number of contemporary musical genres.
- Digital technology is included because it might promote another type of creative process within which the role of expertise is negotiated.
- Youth culture is addressed because this field seems more flexible, changeable, and unstable than grown-up culture.
The assumptions are elaborated in chapters four and nine. However, it is not assumed these hypotheses are correct in any definitive way. Rather, the hypotheses provide the strategic argument for choosing this specific substantive area. In other words, the field is specifically chosen in order to explore and challenge general notions about the connection between expertise and creativity. Accordingly, the result of this thesis may not necessarily be relevant to apply to other fields, at least not in any simple terms.

1.4.2.2 The measurement of expertise and creativity

Because the relation between expertise and creativity is examined it is necessary to find a way to categorize, understand, and to some degree measure the two phenomena. I will return to that discussion in part two and three. However, in order to understand the rationale behind the study design, it is important to explicate the basic assumptions lying behind the attempt to measure and categorize the main concepts.

First of all creativity is understood basically as a social construction. This is the reason why evaluation groups are applied in the design. In other words, instead of basing the evaluation exclusively on my own idiosyncratic preferences, the attempt is to simulate a social construction. Next, expertise is interpreted as ‘having played a musical instrument for more than approximately ten years’. Thus, people with and without instrumental skills are recruited in the case studies representing different levels of expertise.

As described in the sections above, the thesis is inspired by qualitative research strategies as well as experimental methodology. This is equally reflected in the approach and operationalization of the two main concepts. Thus, on the one hand creativity and expertise are understood as qualitative concepts, essentially not possible to measure or categorize in a quantitative or linear way. On the other hand, the participants are categorized a priori in different groupings according to presupposed levels of expertise based on their former experience. Further, the evaluation groups are asked to grant the final compositions points according to a rating scale. Hence, expertise and creativity are investigated from a qualitative perspective as well as from a quantitative perspective (see also chapters two, three, and eleven).
1.4.3 The study compared to other similar studies

A number of studies have been conducted in order to investigate questions of creativity, musical technology, and implications of expertise (Scripp et al., 1988; Folkestad, 1996; Smith & Younker, 1996; Seddon & O’Neill, 2003; Hewitt, 2009). In the discussion below, two of the most important and relevant studies are presented.

The present study is partly inspired by an investigation of computer-based music-making and young people within an institutional context, conducted by Göran Folkestad (1996). Folkestad monitored fourteen young people between thirteen and sixteen years old over a period of two years. The young people composed music without any specific restrictions or assignments, primarily using the computer. The study included participants both with and without instrumental musical training. It was first and foremost explorative and the discussion of musical competence only played a minor role. Nevertheless, the study indicated no general significant difference between the music of the novices and the experienced (p. 185). Furthermore, the study implied that people without piano skills are more likely to explore the possibilities provided by the computer equipment (p.197).

Opposed to Folkestad’s longitudinal study, Frederik Seddon and Susan O’Neill conducted a short-term study among 48 young people between the ages of 13 and 14. Among the participants, 25 had between two and four years’ of prior experience of formal music tuition. The rest had no prior experience of instrumental music training. The participants were invited to engage with a computer-based composition task after two 30-minute training sessions. The participants were given three sessions to finish their composition. The study indicates that the musically experienced are less likely to engage in explorative activity compared to the novices (pp. 132-134).

The two studies exemplify pros and cons with respect to different research approaches. Folkestad’s qualitative study offers detailed information on the processes of composition. Thus, the long-term period allowed the researcher to study many aspects of creative work. However, the comprehensive amount of empirical material produced over two years promotes an analysis on a macro scale rather than a micro scale. Further, the limited number of participants might be argued to weaken the generalizability of the study. On the other hand, Seddon and O’Neill’s short-term study offers information that might also be used on a more quantitative scale, considering the number of people participating. In turn, the limited time for composition might disrupt the attempt to understand
creativity as it unfolds in a naturalistic setting. In other words, the external validity may be questioned (Barab & Squire, 2004).

The present study differs from the studies described above in a number of ways: (1) firstly, my focus is ‘creativity’ which eventually means that questions of value cannot be ignored (see Chapter Four). In the studies referred to above, the compositions’ value was not addressed systematically and the evaluation of the musical outcomes was mostly done by the researchers themselves (even though it should be mentioned that Folkestad used two judges in order to triangulate the analysis in general). In the present study, I used evaluation groups in order to simulate social constructions of creativity. (2) Secondly, I recruited young people with many years of instrumental music training. Thus, it is very likely that differences between novices and experts will appear more explicit in this study compared to Folkestad’s and Seddon & O’Neill’s. Further, it allowed me to explicitly address the notion about the ‘ten year rule’ presented earlier in this chapter. (3) Thirdly, I attempted to find a balance between in-depth analysis and questions of generalizability. This was done through the different phases, outlined in the above, which allowed me to study the main research question among many groups of people and still analyse a limited number of cases in-depth. (4) Fourthly, I tried to find a balance between a long-term and a short-term period of composition. Thus, the participants in this study composed music for approximately 20 hours. (5) Finally, I applied multiple methods of data collection methods that included interviews, saved computer files, screen recordings, video recordings, questionnaires, and evaluation groups. This gave me the opportunity to track and investigate the birth of a creative idea from many different perspectives.

1.5 The thesis in situ

Clearly, this project was generated within a specific time and place that strongly influenced its process and outcome. In the following, important stakeholders as well as general trends within the field of pedagogics are outlined in order to explicate the connection between the thesis and the surrounding world within which it is embedded.

1.5.1 Stakeholders

The thesis was written in a partnership between University College Zealand and the University of Southern Denmark. Accordingly, the thesis is a product of different interests, goals and rationales.
Jens Rasmussen is one of the scholars that have tried to unfold the differences between these two types of institutions. From a Luhmann-inspired systems-theory perspective he divides the university colleges and the traditional universities into two main categories: the research conducted at the universities is associated with basic research, general knowledge, and the search for ‘truth’, whereas the research initiated by the university colleges is associated with applied science, development of practice, local knowledge and the search for ‘what works’ (Rasmussen, Kruse & Holm, 2007, p. 45; see also Nielsen, 2009). The picture might not be absolutely appropriate in the sense that Rasmussen’s arguments seem to include a mix between normative and descriptive rationales (Boysen, 2010e). Further, the role played by the different type of institutions is constantly negotiated and challenged (Bjerre & Pedersen, 2007). However, essentially Rasmussen’s categorisation mirrors my own impression and experiences quite well.

These different objectives and interests presented by the two types of institutions are equally reflected in the orientation of this thesis. As emphasized in the very first section of this chapter, my initial interests were not really of a didactical or pedagogical sort. In other words, even though I was an associate professor within such fields as music-didactics, education, etc. I was more interested in exploring main relations between creativity and expertise than in, say, how technology might be used to facilitate creativity. However, in order to get support from the University College Zealand, the thesis needed to have some kind of direct relation to pedagogical practice and a potential impact on local pedagogical practices. Thus, the result was a kind of mix between basic science and applied science, including methods like design-based research in order to deal with local, didactical questions.

<table>
<thead>
<tr>
<th>Table 2.2 Basic science and applied science</th>
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<tr>
<td><strong>Research associated with...</strong></td>
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<td>---------------------------------------</td>
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<tr>
<td>Basic Science</td>
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<tr>
<td>General knowledge</td>
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<tr>
<td>‘The truth’</td>
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<tr>
<td><strong>Issues and questions in this thesis</strong></td>
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However, during the work on the thesis, I eventually returned to what might be considered basic science. That doesn’t mean that didactical questions are left unexplored. Rather, didactical questions are investigated in specific phases of the PhD-study and discussed in specific articles.
written during the process of conducting the PhD, whereas the main analysis of the relation between expertise and creativity forms the main part of this thesis (see table below).

<table>
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<tr>
<th>Table 1.3 Different phases and outcomes</th>
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<tr>
<td><strong>Studies</strong></td>
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<tr>
<td>Applied science</td>
</tr>
<tr>
<td>• The flexible phases of the case studies</td>
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<tr>
<td>• Design-Based Research projects and fieldwork in schools</td>
</tr>
<tr>
<td>Basic science</td>
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<tr>
<td>• The fixed phase of the case studies</td>
</tr>
<tr>
<td>• Interviews with professional producers and composers</td>
</tr>
<tr>
<td><strong>Outcomes (articles)</strong></td>
</tr>
<tr>
<td>Applied science</td>
</tr>
<tr>
<td>• ‘Teaching in a world where nothing is wright and nothing is wrong’ (Boysen, 2013b)</td>
</tr>
<tr>
<td>• ‘Aesthetics in preeschool’ (Boysen, 2015a)</td>
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<tr>
<td>• ‘Does creativity rely on expertise’ (Boysen, 2015b)</td>
</tr>
<tr>
<td>Basic science</td>
</tr>
<tr>
<td>• ‘Creativity, children and technology: a discussion of the concept of creativity in relation to digital technology and children's musical expressions’ (Boysen, 2013a)</td>
</tr>
<tr>
<td>• ‘Gender and music-technology within the pedagogical education and the pedagogical profession’ (Boysen, 2014)</td>
</tr>
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</table>

Obviously, the outlined division is tricky. The discussions and investigations of the relation between expertise and creativity are highly relevant for, and intertwined with, didactical questions and vice versa. Yet, the methodological apparatus applied in the different categories and phases points in different directions (see chapters two and three).

### 1.5.2 Trends

Obviously, the research question is connected to different trends, discourses and traditions. In other words, the focus of the thesis reflects, and is partly formed by, educational, societal, pedagogical and political trends:

- First, the focus on creativity and innovation seems substantial in education and in professional life. Thus, originality is often valued more highly than tradition and reproduction. In pedagogical settings, children must habitually learn to be original, rather than ‘just’ reproduce traditional rules and meanings (Florida, 2002; Lieberkind, 2006; Hildebrandte & Lauersen, 2009; Boysen, 2013b). Thus, the role of traditional skills and expertise are questioned.

- Second, the global community is often portrayed as something fragmented, rapidly evolving, and unstable (Tomlinson, 1999; Qvortrup, 2001; Hastrup, 2004; Giddens, 2009). Thus, traditional fields of knowledge may appear less homogenous and static (Wheale, 1995). Accordingly, traditional didactic dispositions are questioned (Ziehe & Stubenrauch, 1982; Boysen, 2010d; Nielsen, 2010). As a result, one may ask which types of knowledge and
skills are to be considered central and essential, if knowledge domains are changing rapidly? Must children read the famous traditional Danish authors, or is such literature to be considered outdated and a waste of time (Hammershøj, 2009; Nielsen, 2010).

• Third, concepts like lifelong learning and unlearning are part of a discourse in which the individual needs to develop in order to fit the constantly changing society (Boysen, 2013c). Accordingly, experience is sometimes considered a problem in the sense that old knowledge potentially stands in the way of new knowledge. In other words, experienced people are ultimately considered conservative rather than inventive (Krejsler, 2005; Boysen, 2013c).

• Fourth, in the western world, the concept of creativity is connected strongly to notions of so called ‘romantic originality’, as well as the privileged position of the genius, developed mainly in the nineteenth century (Macfarlane, 2007; Weisberg, 1993). Thus, explorations of creativity are often preoccupied with individually formed original ideas rather than, say, distributed creativity or folklore. In the present thesis the individual approach to creativity is both adopted and challenged.

• Fifth, in late modern society the role of the producer and the role of the consumer appear to be more confluent. According to this perspective, creativity is not only for the few privileged people. Rather, creativity is a universal form of expression. In other words, we are all artist (Keen, 2007; Ackermann, E., Gauntlett, D., Wolbers, T. & Weckström C., 2009; Hammer 2010, Boysen 2012).

• Finally, Danish pedagogy may be influenced by the norms and thoughts within the Danish reformed-pedagogical movement (Gøssel, 1930, 1956; Thing, 1996; Michelsen, 2001; Boysen, 2015b). Within this movement, expertise is partly something that is considered inhibiting for spontaneous and natural creative behaviour. Thus, the notion that training might result in less creative achievement may be connected to this cultural and academic legacy.

Naturally, the list of trends is not complete. Nonetheless, it is important to emphasize the connection between the present thesis and these various discourses. By doing so, potentially blind spots might be discovered (Clarke, 2005). Furthermore, the partial perspective of the thesis is underlined and explicated.
1.6 The content and structure of the thesis

Naturally, the chosen methodological approach affects the structure of the thesis, and vice versa. Thus, the overall disposition of the thesis might be associated with more deductive strategies, whereas continuous explicit focus on the research process in the various chapters may be associated with more inductive or grounded methodological strategies. Hence the structure of the thesis reflects the attempted balance between different research strategies.

1.6.1 The disposition of the thesis

In the first sections of this chapter, the complexity of the main research question is indicated. In the rest of the thesis the attempt is made to address this complexity through multiple perspectives, including perspectives of culture, learning, intentionality, autonomy, consciousness, materiality, aesthetics, etc. However, the point of departure is the three key topics addressed in the title of the thesis, namely creativity, expertise, and digital music technology. Accordingly, the thesis is divided into six parts. First the methodological framework is outlined and discussed (Part One). Secondly, the three main topics of creativity, expertise, and music-technology are investigated (parts two, three, and four). Finally, the analysis of the case studies is presented (Part Five) and discussed with respect to the theoretical framework outlined (Part Six).

The main idea is to make a journey from creativity as a somewhat abstract phenomenon and subsequently move closer and closer to the concrete case studies. It is a bit like putting different lenses on top of each other. In other words, the second part is about creativity in general; the third part is about expertise discussed through the lens of creativity; the fourth part is about music-technology discussed through the lenses of creativity and expertise; and finally, the concrete case studies are analysed systematically (see figure 1.1 below).
Naturally, the construction of the thesis is related to the overall approach to the main question. As described in the very first section of this chapter, the aim is to connect the concrete case studies to general discussions of creativity and expertise. Accordingly, creativity and expertise form the point of departure. Needless to say, this is not a stringently grounded methodological approach. Rather, this is a more deductive approach in the sense that specific categories are chosen a priori. However, the chapters are the result of an ongoing dialog between theoretical suggestions and empirical implications. Thus, the different chapters also include discussions of the concrete case studies.

1.6.2 The process of research and the outcome of research

In grounded theory as well as in actor-network theory it is repeatedly underlined that the researcher must describe the process in detail. In grounded theory, research moves in several iterative circles. The hypotheses are constantly developed, changed, and explored until the researcher reaches some kind of theoretical saturation. In order to account for this process it is crucial that the researcher writes down the reflections, analysis and course of events during the process, for instance through memo-writing. Further, grounded theory encourages the researcher to make use of unconventional sources, such as novels or movies. Hence, it becomes even more important to explicate such unexpected roads to knowledge. Moreover, according to actor-network theory, the researcher is defined as one actor in a network, rather than some kind of observer looking at the world through a widow (Latour, 2005). Hence, the researcher is influenced by and connected to many other actors:
books, TV programs, friends, etc. Thus, the researcher must try to monitor and account for the process of research.

It follows that the process of research is not hidden but rather explicated in this thesis. Thus, the ambition is to inform and reflect upon important events during the work with the thesis, e.g. sudden changes of perspective, important new insights, and so on. These forms of reflections are first and foremost included in appendix J, K, L, M, and N.
Part One: The methodological framework
Chapter Two: The method

2.1 A mixed approach

The methodological approach in this thesis is best described as a mix between different positions. Thus, the methodology applied is basically inspired by mixed methods as described by, among others, Creswell (2003), Tashakkori & Teddlie (2003), and Johnson & Onwuegbuzie (2004). According to this position, methodological pluralism and eclecticism is considered more productive than a mono-methodological approach.

[Mixed method] is inclusive, pluralistic, and complementary, and it suggests that researchers take an eclectic approach to method selection and the thinking about and conduct of research. What is most fundamental is the research question - research methods should follow research questions in a way that offers the best chance to obtain useful answers. Many research questions and combinations of questions are best and most fully answered through mixed research solutions. (Johnson & Onwuegbuzie, 2004, pp. 17-18)

Accordingly, the basic assumption within the tradition of mixed methods is that it is possible to combine qualitative and quantitative strategies in a fruitful way as long as the tools are appropriate in terms of the objective of the research. In this thesis, the ambition is to explore an assumed relation between expertise and creativity. However, at the same time the ambition is to maintain an open approach to the studied field. Thus, on the one hand the methodological design is inspired by deductive research such as quantitative and experimental studies, and on the other hand the tools of research are provided by qualitative methodologies. Furthermore, the aim in the thesis is to find ways to facilitate creativity, which means that the pedagogical design that frames the central activities is refined during the process. This multiple and eclectic approach leads to a wide variety of challenges, problems, and questions. However, the basic argument in the thesis is that a mix between different positions is preferable compared to a definitive exclusion of respectively quantitative, qualitative, or development-oriented strategies.
A basic suggestion within the field of mixed methods is that ‘researchers should collect multiple data using different strategies, approaches, and methods in such a way that the resulting mixture or combination is likely to result in complementary strengths and nonoverlapping weaknesses’ (Johnson & Onwuegbuzie, 2004, p. 18). Thus, it is fundamental to contemplate the pros and cons regarding the different methods applied. In this chapter, the point is to present the different methods employed and discusses the strengths and weaknesses associated with the different strategies.

2.1.1 The four basic positions applied

The specific traditions being applied are grounded theory (GT), actor-network theory (ANT), experimental methodology, and design-based research (DBR). These approaches are not treated equally. Grounded theory represents the starting point. This qualitative basis of the study is subsequently supplied by experimental methodology in order to pursue specific questions and causalities as well as achieve some kind of generalizability. Actor-network theory represents a method as well as an alternative interpretation of the empirical world (Chapter Eight). Accordingly, actor-network theory plays an important part in terms of the construction of the analytical and theoretical frame of the thesis. However, in regard to the methodological strategies, ANT is primarily included as a deconstructive and challenging supplement to GTM. Design-based research is applied in order to address developmental issues regarding the pedagogical design. Furthermore, DBR is struggling with some of the same methodological dilemmas as I meet in the present research project, e.g. in terms of the strategy of mixed method. Thus, DBR is used as inspiration and assistance in terms of the various methodological hitches discussed in the thesis.

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Grounded Theory Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTM</td>
<td>GTM is adopted in order to explore the initial research question on a qualitative level and yet maintain a systematic approach. However, a clear-cut grounded theory approach would not be adequate to examine specific causalities.</td>
</tr>
<tr>
<td>Experimental Methodology</td>
<td>Experimental methodology is adopted in order to examine specific questions and achieve some degree of external validity. A pure experimental design is avoided because the aim is to explore the initial selected research question and not only test hypotheses.</td>
</tr>
<tr>
<td>Design-based research</td>
<td>References to DBR are made because the research project is also addressing didactical issues. Furthermore, DBR is struggling with a mix between qualitative and quantitative approaches. Thus, in many ways, the present research project and DBR are related from a methodological point of view. Yet, the main focus in DBR is to develop and account for artifacts that enhance learning, which is not the main focus in the present study.</td>
</tr>
<tr>
<td>Actor-network theory</td>
<td>ANT is applied in order to question the constructed conclusions and findings in the analysis and the following urge to categorize, theorize and generalize. On the other hand, a strictly ANT approach would make it impossible to examine the initial research question systematically.</td>
</tr>
</tbody>
</table>
Conclusively, it must be stressed that the balance between inductive and deductive approaches is not orchestrated as an unambiguous external discussion between ANT, GTM and DBR in one corner and positivistic and quantitative derived experimental methodology in the other. Rather, the balance between an explorative and a more hypotheses-testing approach is considered a constant internal theme and challenge within qualitative methodologies in general (Johnson & Onwuegbuzie, 2004, p. 22). Thus, this discussion of induction versus deduction plays a central part in the following sections in which the different methodological approaches are presented and discussed.

2.2 Grounded theory

Grounded theory was originally developed by Glaser and Strauss (1967) and is generally considered as part of a qualitative counteraction to the tradition of quantitative methodology predominant within sociology and psychology at the time (Hallberg, 2006, p. 142). Most importantly, Glaser and Strauss claimed that a theory had to be formed out of empirical data. In other words, they rejected the tradition of deductively falsifying or verifying a priori constructed theories (Hallberg, 2006, p. 142). Eventually, GT developed in different directions. According to some scholars, the constructivist and relativistic elements became increasingly explicit in Strauss’ version of grounded theory, whereas Glaser insisted on an essentially positivistic and empiricist position in which an objective reality is presupposed (Hallberg, 2006, p. 145). The constructivist approach was subsequently further elaborated by Donna Haraway (1991), among others, and incorporated into situational analysis. In turn, this method is sometimes considered part of a postmodern turn; essentially emphasizing localities, partialities, positionings, instability, and fragmentation, rather than the modernist focus on universality, generalisation, simplification, and stability (Clarke, 2003, p. 555). In other words, the tradition of grounded theory apparently contains an internal tension between different positions representing various ontological and epistemological suggestions. Such tensions between universality versus partiality and positivism versus relativism are also embedded in this study and will be elaborated throughout the thesis.

2.2.1 The open approach

One of the basic principles of GTM is that the researcher must maintain an open mind and avoid deductively forcing the data into pre-produced theoretical frameworks: ‘Grounded theory looks for
what is, not what might be’ (Glaser, 1992, p. 67). This raises several epistemological questions and is one of the major problems and challenges within GT. Glaser and Strauss try in different ways to solve these problems by suggesting specific coding procedures etc. (Glaser & Strauss, 1967; Glaser, 1978; Strauss & Corbin, 1990). Still, this fundamentally ‘open’ epistemological approach is criticized by many practitioners of grounded theory, and is equally being moderated or neutralized in many grounded theory studies (see for instance studies described in Bryant & Charmaz, 2007). Most importantly, the idea of an objective researcher who enters the field without any type of preconception is not really accepted in the present scientific context. For instance, Chalmers refers to this approach as being ‘naive empiricism’ or ‘naive inductivism’ (Chalmers, 1990). Similarly, Bryant and Charmaz make the basic point that anyone ‘starting research will most certainly have some preconceived ideas relevant to the research area’ (Bryant & Charmaz, 2007, p. 20). Further, Kelle criticizes this approach for being a bit naive and outmoded: ‘The idea that theoretical categories and propositions could be derived by simple (‘inductive’) generalizations from observable data by researchers who have freed their minds from any theoretical preconceptions whatsoever before collecting empirical data manifests a rather outmoded view of scientific inquiry’ (Kelle, 2007, p. 197). Nevertheless, the ‘open’ approach is a cornerstone in GTM. In this thesis the ambition is to incorporate grounded theory in order to complement the methods derived from experimental methodology, and, by doing so, trying to avoid forcing the data (too much) into specific theoretical frameworks and preconceptions.

In the following some of the main principles and concepts in GTM are discussed in relation to the methodological approach in this thesis. However, this is a selective presentation of GT. In other words, I present the key concepts I find relevant for the discussing of the methodological dilemmas previously indicated: That is, the discussion concerning the dichotomies of openness/closure, induction/deduction, partiality/generalizability, objectivity/relativism, and simplicity/complexity. Thus, the following concepts are introduced and discussed; ‘theoretical sensivity’, ‘theoretical sampling’, ‘formal theory’, and ‘memo writing’. Additionally, a number of key concepts within the field of GT are included without further introduction, as they are considered well-known parts of qualitative methodology, e.g. ‘constant comparison’, ‘triangulation’, and ‘coding’.
2.2.2 Theoretical sensitivity

One of the main GTM principles/conceptions is the term ‘theoretical sensitivity’ and the use of literature in the research process. The concept is rather interesting and symptomatic for the GT approach in the sense that it reveals the dilemma between keeping an open mind and still implements specific theoretical lenses. According to Strauss and Corbin, the researcher must maintain an open approach to the data by avoiding extensive literature reviews (Strauss & Corbin, 1990, pp. 49-53). This means that the researcher must ground the emerging categories and theories in the available data instead of preconceived concepts developed by other researchers and theorists. Thus, the analysis must not be rooted in the relevant research literature. Consequently, the researcher must ‘ignore the literature of theory and fact on the area under study, in order to assure that the emergence of categories will not be contaminated’ (Glaser & Strauss, 1967, pp. 37).

However, that doesn’t mean that theoretical perspectives are forbidden. Instead, the researcher must own ‘theoretical sensitivity’, which means that the researcher must be able to apply, or be inspired by, different theoretical approaches (Strauss & Corbin, 1990). ‘Indeed the trick is to line up what one takes as theoretically possible or probable with what one is finding in the field’ (Glaser & Strauss, 1967, p. 253). Thus, ‘a wide array of sensitizing categories from different theoretical traditions can be used to develop empirically grounded categories’ (Kelle, 2007, p. 209).

The competence needed for such an ambiguous scientific operation is discussed by Judith Holton:

Theoretical sensitivity requires two things of the researcher: analytic temperament and competence. The required analytic temperament will allow the researcher to maintain analytic distance from the data, tolerate regression and confusion, and facilitate a trust in the power of preconscious processing for conceptual emergence. As to analytic competence, the researcher must be able to develop theoretical insights and abstract conceptual ideas from various sources and types of data. Reading widely in other disciplines is a recommended means of enhancing theoretical sensitivity. (Holton, 2007, p. 275)

The dilemma is obvious; how is it possible to keep an open mind and still implement different theoretical perspectives? Bryant and Charmaz notes that the term theoretical sensitivity consequently works to ‘undermine one of the basic principles of GTM: an open-minded, framework-free orientation to the research domain’ (2007, p. 18). In order to address this problem,
GT researchers place themselves in different positions. Some researchers stress the importance of keeping an inductive approach: ‘The researcher should enter the domain with no preconceived problem statement, interview protocols or extensive review of literature’ (Holton 2007 cited in Bryant & Charmaz, 2007, p. 20). Others argue that an open mind can be combined with substantial knowledge on the research domain. Dey stresses that ‘we should not confuse an open mind with an empty head’ (Dey, 2007, p. 176). Similarly, Barry Gibson wonders how researchers develop theoretical sensitivity without some familiarity with relevant literature (Gibson 2007 cited in Bryant & Charmaz, 2007, p. 20).

According to the epistemological discussions presented earlier, it is not the basic notion in this thesis that concepts can emerge from data without theoretical frameworks or preconceptions. On the other hand, it is important to avoid forcing the data into predetermined categories and concepts. Consequently, theoretical frameworks are applied and explicated in this thesis. Yet, the open approach to the data is maintained through a set of methods partly derived from GTM, including the guidelines offered by the concept of theoretical sensitivity. Firstly, this means that a wide variety of theoretical perspectives are included in the applied framework. For instance, the thesis contains various and divergent sociological, psychological, and neurological approaches to the field of expertise and creativity. Secondly, it means that empirical observations and findings are connected to theoretical concepts throughout the analysis instead of a priori. For instance the theory of blind-variation and selective-retention (see Chapter Five) was picked up rather late in the process of research in order to address the nature of coincidence that seemed to play a major role in the conducted case studies. Thus, the ambition is not to avoid relevant research literature but instead construct and maintain an inclusive and broad theoretical framework.

2.2.3 Theoretical sampling

In order to work out a theory, GTM includes theoretical sampling: ‘theoretical sampling is the process of data collection for generating theory whereby the analyst jointly collects, codes, and analyses his data and decides what data to collect next and where to find them, in order to develop his theory as it emerges’ (Glaser & Stauss, 1967, p. 45). This method enables an iterative process whereby a theory can be built up through the construction and deconstruction of hypotheses. Consequently, the researcher eventually applies a more focused, narrow, and selective approach to the data already collected as well as the ongoing data collection:
The main principle of theoretical sampling is that the emerging categories, and the researchers’ increasing understanding of the developing theory, now direct the sampling. Researchers deliberately seek participants who have had particular responses to experiences, or in whom particular concepts appear significant. (Morse, 2007, p. 240)

In other words, the initial ‘open approach’ is gradually substituted by a relatively closed perspective. From a methodological point of view, the described procedure exemplifies the constant balance between inductive and deductive approaches. Obviously, theoretical sampling belongs to the more deductive tools in the GTM toolbox. Thus, quantitative and experimental methodology and GTM are, in this respect, highly intertwined, which is equally reflected in the GT adoption of concepts derived from quantitative methodology and practice, e.g. ‘negative cases’ and ‘outliner’ (Morse, 2007).

According to the above, theoretical sampling may represent a part of GTM that overlaps with aspects of experimental methodology. Such overlapping aspects are relevant for two reasons. First, they may support the notion that a mixed approach is essentially workable. Second, the discussed overlap is interesting in the sense that it provides a stepping stone to walk on in the process of constructing a legitimate mixed methodological framework. In this thesis the collection of empirical data was conducted in iterative cycles, which allows ongoing theoretical sampling throughout the process of research.

2.2.4 Memo writing

According to the research strategy of grounded theory, memo writing is a crucial part of the research process (Richardson, 1998; Charmaz, 2006; Lempert, 2007). Basically, memo writing is an ongoing process that is used in order to clarify reflections, monitor analytical processes, remember analytical ideas, highlight specific positions, etc. In other words, memos may facilitate the analysis as well as document the process, e.g. with regard to the construction and deconstruction of hypotheses, novel perspectives applied, and selective analytical strategies.

*By writing memos continuously throughout the research process, the researcher explores, explicates, and theorizes these emergent patterns. It is the*
methodological practice of memo writing that roots the researcher in the analyses of the data while simultaneously increasing the level of abstraction of his/her analytical ideas [...]. Ultimately it is the integration of these abstract analyses developed in memos that the researcher shares with a public audience. (Lempert, 2007, p. 245)

There are no specific guidelines or widely accepted rules in terms of how to design memos. A memo might be ‘messy’, ‘incomplete’ and represented in ‘fragmented phrases’, ‘weird diagrams’ or ‘half sentences’ (Lempert, 2007, p. 249). Thus, it is questionable whether memo writing constitutes any distinctive or unique research strategy in the sense that note making is a technique associated with research in general. What may be different is that the research process in GTM includes the researcher’s individual constructions of categories and theory. Thus, memo writing becomes particularly important for at least two reasons. Firstly, memo writing helps the researcher in the process of developing abstract theories that are still very much rooted in the concrete empirical data (Charmaz, 2006, p. 72). Secondly, memo writing produces documentation and facilitates reflection regarding the researcher’s partial and situational position as well as the specific dispositions made in the process of research.

In relation to the second outlined reason, memo writing may be associated with recent trends within the field of qualitative research, including ‘the postmodern turn’ discussed in the above (e.g., Krogstrup, 2001; Lather, 2001; Fontana, 2002; Clarke, 2003). From this point of view, the researcher is not an ‘all-knowing analyst’ but rather an ‘acknowledged participant’, which means that the researcher’s opinion is not privileged but just one interpretation among others. Accordingly, the researcher must clarify, explicate and describe the research process and account for his or her own idiosyncratic interest and position in the field. Hence, the research process through memo writing is not only an investigation of a specific empirical object but equally an investigation of the researcher’s personality and dispositions. In other words, the researcher and the analysis are
In the current research project, memo writing was applied throughout four years of research. Furthermore, two case studies on the topic were conducted beforehand, equally with the implementation of memo writing (the first phase of the case studies). The type of memo writing is quite comprehensive and inclusive in the sense that the context is not limited strictly to analytical discussions but rather contains a diversity of findings, construction of hypotheses, reflections, ideas, and observations. Thus, the adopted approach to memo writing is strongly linked with some of the main principles in GTM as well as in (postmodern) qualitative research in general (see appendix J, K, L, M, and N).

### 2.2.5 Formal theory

A main question within qualitative/quantitative research is the extent to which conclusions of a survey may lead to general implications. Among researchers preoccupied by grounded theory, this discussion also plays a vital role. However, the scientific and methodological position claimed by GT researchers results in specific and significant dilemmas regarding the connection between the particular and the general. The reason for this ambiguity is the attempt in GTM to stay close to the empirical data and not shift the focus to general theorization at the expense of the data at hand. In other words, the research must be ‘grounded’ in the empirical data. Thus, the question, from a GT perspective, is whether it is possible to formulate general claims without drifting away from the specific data.

In the article ‘Doing Formal Theory’ (2007) Barney G. Glaser addresses this issue and complains of the fact that the majority of GT research does not provide constructions of general theory (Glaser, 2007, p. 97). Glaser’s argument is based on a distinction between the concepts of ‘substantive

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1 Nevertheless, it must be stressed that grounded theory, as developed by Glaser and Strauss (1967), is partly rooted in 1950s and 1960s positivistic inspired social science and can therefore not reasonably be described as ‘postmodern’, although many elements in GT methodology clearly point in a postmodern direction (e.g., Clarke, 2003). However, many GT researchers have developed the methodology in a postmodern direction. Accordingly, in the current study, the methods applied are adopted partly from some of these new interpretations of GTM, first and foremost, situational analysis as developed and described by Adele Clarke (2003) and Donna Haraway (1991).
theory’ and ‘formal theory’. According to Glaser, ‘substantive theory’ refers to theory exclusively claiming to describe the analyzed empirical data, whereas ‘formal theory’ also claims to address issues on a general level (Glaser, 2007, p. 99). However, Glaser stresses that formal theory must not be confused with theory often referred to as ‘grand theory’, frequently criticized by members of the GT community because of the lack of empirical grounding regularly associated with this type of work.

*FGT is not so-called ‘grand theory’, general theory, elaborated theory, middle range theory, etc. It has no predetermined level of abstraction. It will end up at the level of abstraction that the data and studies bearing on the core category (and the energy and resources of the theorist) will allow it.* (Glaser, 2007, p. 100)

Glaser suggests a number of strategies in order to ensure that formal theory does not drift away from the empirical data. Firstly, Glaser stresses that the iterative methodological process must be sustained during the process of generalization (Glaser, 2007, p. 100). Secondly, he suggests that the generalization must be conducted through the inclusion of other empirical studies (Glaser, 2007, p. 99). Thirdly, Glaser suggests that basic GT methods must be applied throughout the process of generalization (Glaser, 2007, p. 100).

Still, the dilemma between a focus on generalization and a focus on the specific is obvious. Thus, on the one hand Glaser stresses that ‘FGT generalizations are conceptual not descriptive, and thus abstract of time, place, and people’ (Glaser, 2007, p. 100). On the other hand, Glaser emphasizes that, ‘FGT is not speculatively remote from data, especially the data it purports to explain. It is based on data and studies based on data’ (Glaser, 2007, p. 100). Glaser is very much aware of this methodological dilemma, but insists that the maneuver is possible.

*The reader may question: Can one generalize from a single case SGT? Isn’t one case too particularistic? Of course. But people do it anyway, researchers and laymen alike. General implications abound at all levels. What FGT does is to broaden the base of generalizing ‘to and from’. FGT allows generalizing on a core category from several substantive areas with more multivariate conceptual complexity. In sum, FGT is nothing more than extending the general implications of a core variable by sampling more widely in the original*
In this thesis the same dilemma exists. On the one hand the analysis is grounded in the empirical data. On the other hand the ambition is to say something general about a specific issue. A number of strategies are derived from Glaser’s interpretation of GT and applied in the research in order to address this problem. Firstly, the strategy is to recruit various groups of participants and accordingly sample widely in the substantive area (see Chapter Three). Secondly, the iterative processes are sustained during the process of generalization. Hypotheses are continually tested and reviewed and the explorative approach to the empirical data is maintained using a number of the GT methods, including memo writing, theoretical sensitivity, triangulation, and comparison. Thirdly, other data and studies in the same substantive area are included in the analytical phase: for example, research within the field of music, composition and technology. Furthermore, research within other substantive areas are addressed and discussed, e.g. a variety of studies conducted within the field of creativity, thinking processes, and learning processes.

Still, it must be stressed that the dilemma between simplicity and generalization on one side and the particular and complex on the other is not easily resolved, and may never be resolved at all. Adele Clarke, one of the founders of situational analysis, equally addresses this highly relevant problem. With a reference to Law and Mol’s work on complexities and social studies, she reintroduces the question formulated by the two authors: ‘How might complexities be handled in knowledge practices nonreductively, but without at the same time generating ever more complexities until we submerge in chaos’ (Law & Mol, 2002, p. 1). According to Clarke, situational analysis partly deals with this question. However, typically for postmodern approaches, situational analysis is not really, in my opinion, suited to reduce complexity, but rather the opposite. Thus, Clarke emphasizes frequently the ‘partial, tenuous, shifting, and unstable nature of the empirical world’ (2003, p. 556), stressing the link between situational analysis and other qualitative approaches that attempt to embrace the complexity of reality, e.g. the strategy of ‘thick description’ developed and described by Clifford Geertz (1973) (see also Ponterotto, 2006). Accordingly, situational analysis offers tools to grasp the complexity of the empirical world, but is hardly effective as a tool to reduce complexity and generate general assumptions.
2.2.6 Summing up: Openness versus closure, induction versus deduction

In grounded theory the research is based on several iterative cycles of research until the researcher reaches ‘theoretical saturation’ (Stern, 2007, p. 117). In these cycles the research switches between inductive and deductive methods in order to construct new hypotheses and deductively try out these hypotheses (e.g., chapters seven and nine in Strauss and Corbin, 1990). Accordingly, in the GTM toolbox you find methods and concepts that may be associated with an open analytical approach (e.g., open coding, avoidance of a specific theoretical vocabulary, etc.) and equally methods and concepts that address questions of generalization and the validation of specific hypotheses (theoretical sampling, the iterative process, formal theory, etc.).

As explained in Chapter One, deductive methods are applied most intensively in the third phase of the case studies. However, it must be stressed that the overall study includes several initial case studies (the first two phases of case studies), mainly inspired by qualitative and explorative methods, on the basis of which hypotheses are generated. Accordingly, the initial open approach is successively substituted with deductively inspired approaches in the third phase of the study. In other words, the case studies in the third phase represent the later cycles of research, rather than the early cycles. This aspect is important in order to understand how the semi-experimental design in the third phase is basically part of a grounded theory approach.

2.2.7 Closing remarks

In my introduction of grounded theory I have focused on the elements that I find productive in terms of the inherent dilemmas in the present study. In other words, my presentation as well as my adoption of GT is highly selective. Naturally, that is in line with the strategy of mixed methods. However, I need to clarify a number of deselections. Firstly, I highlighted the aspects of GT that are productive in terms of the formulated research question. Thus, I left aside aspects of GT that do not fit the objective for this study, e.g. postmodern approaches that generate unrestrained complexity and therefore can hardly be combined with the deductive methods applied. Secondly, the stages of analysis, including different forms of coding, categorization and conceptualisation are not followed strictly in the thesis. The reason for this is double. Firstly, a number of codes were constructed a priori, e.g. levels of experience as a category, different forms of creativity as a category, etc. Secondly, it seems more appropriate and productive, at least to me, to conduct the coding process in
a more flexible manner. In doing so, I am following the advice of Hallberg (2006, pp. 141-143), amongst others.

2.3 Experimental methodology

In order to address a number of specific questions and causalities the research design is partly constructed as a semi-experiment. Firstly, this means that variables are kept constant in order to focus on a specific causality, that is, the relationship between expertise and creativity. Secondly, it means that specific hypotheses are tested systematically. Thirdly, it means that specific pedagogical designs are examined. However, experimental methodology contains a number of epistemological and ontological problems and is neither suitable nor possible to adapt as the fundamental approach in this research. Thus, certain methods are derived from experimental methodology while others are excluded.

2.3.1 Classification

As implied in the above, the semi-experiment is not designed as a ‘true experiment’ according to the usual definition (see, for example, Campbell & Stanley, 1963). Actually, some researchers might even not call it a semi-experiment, but rather use other labels such as a pre-experimental design, a static-group comparison, ex-post facto research, causal-comparative or correlational research (Campbell & Stanley, 1963, p. 12, 64; Wiersma & Jurs, 2005, p. 156; Leary, 2008, p. 142). On the other hand, different types of correlational research are frequently referred to as quasi-experiments or semi-experiments (e.g., Evans & Rooney 2008, p. 194). However, this specific question of definition is primarily relevant as long as it helps clarify specific research problems that must be addressed: ‘Essentially, classification systems are valuable to the extent they are useful for enhancing the effectiveness and efficiency by which research is conducted’ (Wiersma & Jurs, 2005, p. 10). In other words, a precise classification is only interesting if it eventually results in reinforcement and clarification of the internal and external validity of the study.

The design here was not a true experiment for a number of reasons. First of all, a true experiment would require the manipulation of specific variables. This was not possible in this research project in the sense that ‘musical competence’ acquired through many years of practice was the main variable of interest. Accordingly, this variable may be understood as a ‘subject variable’ instead of
an ‘independent variable’ (Leary, 2008, p. 194). Secondly, subjects were not randomly acquired, which is one of the most essential elements in experimental designs (Cambl & Stanley, 1963). Instead subjects were recruited specifically and selectively. Thirdly, there were no definitive distinctions between a ‘control group’ and an ‘experimental group’, which is a basic element in experimental as well as semi-experimental designs.  

### 2.3.2 Methodological implications

In experimental terminology a specific uniform code is applied in order to describe different forms of experimental designs. Following Campbell and Stanley’s categorization (1966), an ‘X’ represents the exposure of a group to an experimental variable or event, ‘O’ refers to observation or other types of measurement, and finally ‘R’ represents random assignment to separate treatment groups (Campbell & Stanley, 1966, p. 6). By employing this terminology, differences and similarities between true experimental designs, pre-experimental designs and the current design may be clarified. In the following table the current design is compared with the Static-Group Comparison Design, which may be labeled a Pre-experimental Design according to Campbell and Stanley (1966) and the Posttest-Only Control Group Design, which may be labeled a true experiment (Campbell & Stanley, 1966, p. 6)

<table>
<thead>
<tr>
<th>Table 2.2 Differences between a true experiment and the applied design</th>
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<tbody>
<tr>
<td><strong>Posttest-Only Control Group Design (a true experiment)</strong></td>
</tr>
<tr>
<td>R     X     O1</td>
</tr>
<tr>
<td>R     O2</td>
</tr>
</tbody>
</table>

In the illustration, X refers to the musical training and O refers to the musical course during which observations are made. There is no R present in the applied design because there is no random selection of participants. In terms of validity this raises a number of important questions. Firstly, if the participants are not chosen randomly they might not be representative and consequently unsuited regarding the production of general implications. In addition, the initial group differences

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2 However, this is a matter of interpretation. In an experiment as well as a semi-experiment there may be several experimental conditions, i.e. several different experimental groups (Leary, 2008, p. 192). Moreover, a control group is not always necessary (Leary, 2008, p. 193). Thus, it is possible to define the conducted research as a semi-experiment with two groups of participants, two experimental conditions, and no control group.
might problematize any attempt to establish specific causalities between the independent variable X and the dependent variables. Further, if the independent variable is not controlled in the experiment, the variable will naturally differ from case to case. In other words, the process of learning to play a musical instrument will depend on many different factors, e.g. the type of music played, the teachers, the didactic applied, etc. Thus, it may be difficult to conclude any general type of causality between X and a specific aftereffect. The methodological problems are summed up in the table below.

| Table 2.3 Differences between a true experiment and the current semi-experimental design |
|-----------------------------------------------|-------------------------------------------------|----------------------------------|
| A true experiment                             | The applied design                               | Methodological issues            |
| A random recruiting of participants           | A selective recruiting of participants           | • Initial group differences       |
|                                               |                                                 | • Representativeness              |
| A controlled independent variable             | An uncontrolled independent variable (X defined as the amount of musical training) | • Questions of causality         |

2.3.3 Closing remarks

According to the above, experimental methodology seems very far from GTM, especially with regard to the more constructivist and postmodern versions of this tradition. Therefore, I must stress that I do not uncritically adopt the scientific ideal embedded in this position. If I did so, this thesis would most certainly fail to meet the positivistic derived criteria that are required within this tradition. On the other hand, my basic argument is that the main research question in this thesis addresses questions of causalities and variables.

2.4 Design-Based research

Grounded theory and experimental methods formed the basic methodological foundation in this PhD project. However, design-based research also offered interesting and relevant approaches to the constructed research design and the implied dilemmas. The first reason is that the project addressed didactic issues. In the music course, students were encouraged to create music. The students were being instructed, introduced, interviewed, and so on. Consequently, it is neither possible nor productive to avoid didactical issues. In other words, it is not very productive to create a course that,
in general, inhibits creative work. Furthermore, the project also addressed the pragmatic and learning-theoretical question ‘how to facilitate creativity’. In this regard, this thesis is inspired by pragmatic philosophers and researchers like Dewey and Pierce, who suggest that theories must be judged not only by their claim of truth, but also by their ability to do work in the world (Dewey, 1938 and Barab & Squire, 2004).

In line with the above, there exists an obvious affinity between the chosen methodology and some of the essential elements in DBR, which makes it constructive to include this approach as a supplement to the described methods. Firstly, the music course took place in an institutional context, which is the main field of interest in DBR studies. Secondly, the project balanced between different scientific traditions, which is equally a typical approach in DBR. For instance DBR is often balancing between effect research rooted in experimental methodologies, and contextually-oriented research rooted in qualitative traditions (Collins, Joseph & Bielaczyc, 2004). The same applies to the present research design, as described in the previous sections.

### 2.4.1 What is design-based research?

According to design-based researchers such as Cobb, Confrey, DiSessa, Lehrer & Schuble (2003), and Barab & Squire (2004), DBR consists of a variety of different types of approaches. However, some common features form the basic core in the majority of DBR studies.

> Prototypically, design experiments entail both ‘engineering’ particular forms of learning and systematically studying those forms of learning within the context defined by the means of supporting them. This designed context is subject to test and revision, and the successive iterations that result play a role similar to that of systematic variation in experiment. (Cobb et al., 2003, p. 9)

Thus, DBR is in many ways connected to experimental methodology, in the sense that subjects may be tested, the independent variable is controlled by the researcher-team, and the independent variable is systematically manipulated. On the other hand, DBR differs from experimental studies in the sense that it is conducted in naturalistic settings as opposed to laboratory settings. Hence, DBR is an attempt to include the context in the design as well as in the analyses. The basic notion is that such a methodological strategy leads to findings with a higher degree of validity, a stronger
relevance for praxis matters, and a pragmatic ability to change procedures in educational systems (Brown, 1992; Collins, 1992).

2.4.2 Problems with DBR

In design-based research, the researcher takes on different positions and plays different roles. Often, the researcher is simultaneously functioning as observer, teacher, designer and interventionist. The same applies to the present design. From a classic positivistic point of view this represents quite a problem. Most importantly, the question is how does one detach the empirical claims from the researcher’s interventions and how does one secure an objective examination of the produced empirical data? In the article ‘Putting a stake in the ground’ (2004) Barab & Squire address these questions.

How do we account for the role of the researcher in the design experiments and the associated threats to validity that they bring with them? If a researcher is intimately involved in the conceptualization, design, development, implementation, and researching of a pedagogical approach, then ensuring that researchers can make credible and trustworthy assertions is a challenge. Researchers working in schools often face difficult ethical choices. Do they stand idly by and watch a teacher struggle to use their curricula, or do they intervene, providing additional support? Do researchers share stories of struggling students with teachers and allow them to change instruction accordingly, or do they play a ‘hands-off’ role, minimizing their impact on classroom practices? (Barab & Squire, 2004, p. 10)

Apparently Barab and Squire are trying to find the balance between DBR as a local methodological tool and DBR as a way to generate theories of learning and didacticism on a general level. On the one hand Barab and Squire stress that DBR must deliver theory about learning that can be generalized to a broader field: ‘[W]e believe that while demonstrating local consequence and utility is necessary it is not sufficient—design scientists must draw connections to theoretical assertions and claims that transcend the local context’ (Barab & Squire, 2004, p. 8). On the other hand, they question the very idea of generalization and emphasize that ‘any classroom context, even without the manipulations of a design researcher, is impacted by the systemic constraints in which it is nested, thereby making the generalizability of any naturalistic findings highly suspect’ (Barab &
Squire, 2004, pp. 10-11). Additionally, they stress the fact that the generalization may not be possible because of the researcher’s idiosyncratic involvement in the pedagogical setting (Barab & Squire, 2004, p. 10).

The ‘solution’ to the diagnosed dilemma is, according to Barab and Squire, triple. Firstly, the researcher must adopt strategies derived from qualitative methodology, including GT. ‘[I]t is the responsibility of the researcher to draw on methodological practices consistent with other qualitative methods to convince others of the trustworthiness and credibility of claims being advanced’ (Barab & Squire, 2004, p. 10). Secondly, the researcher must be aware of the fact that generalization might not be possible (Barab & Squire, 2004, p. 10). Thirdly, theory generated through the use of DBR methodology must be flexible in the sense that it may be applied to many different types of contexts:

We believe that contexts are never without agency; there are always teachers, administrators, students, and community members creating context and, therefore, local adaptability must be allowed for in the theory. The goal is not to ‘sterilize’ naturalistic contexts from all confounding variables so the generated theory is more valid and reliable. Instead, the challenge is to develop flexibly adaptive theories that remain useful even when applied to new local contexts. This potential of flexibly adaptive theory does not result because the theory was somehow generated in a context that was free of confounding situational variables, but rather, because the theory is supple enough to maintain its robustness even in the context of changing situational variables. Theory generated from design-based research, from this perspective, must strike a balance between refinement and adaptability. (Barab & Squire 2004, p. 11)

It is obvious that Barab and Squire wish to include the best elements from different methodological traditions (and exclude the bad ones). On the one hand they honor the qualitative, naturalistic, and local dependent approach. On the other hand they wish to verify specific hypotheses and construct theories of general relevance. In the following table the attempt to include the best elements from respectively qualitative and quantitative derived traditions is depicted.
Table 2.4 DBR and the attempt to combine the best of two worlds

<table>
<thead>
<tr>
<th>Pros</th>
<th>…and pros</th>
</tr>
</thead>
<tbody>
<tr>
<td>The purpose is to generate theory in a naturalistic and local context without the artificial biases caused by a laboratory design</td>
<td>…and still be able to produce theory that can be applied to different contexts on a general level</td>
</tr>
<tr>
<td>The purpose is to involve all the participants in the design and analysis</td>
<td>…and still be able to produce a relatively consistent conclusion</td>
</tr>
<tr>
<td>The purpose is to do research in constantly changing iterative circles</td>
<td>…and still be able to test, explore and verify specific hypotheses</td>
</tr>
<tr>
<td>The purpose is to include multiple variables in the design and analysis</td>
<td>…and still be able to isolate specific causalities between specific variables</td>
</tr>
<tr>
<td>The purpose is to produce pragmatic knowledge, that might lead to improvements in a local context</td>
<td>…and still produce fundamental theory about how people think and learn</td>
</tr>
</tbody>
</table>

The question is whether or not this attempt to combine different traditions and interests is effective. From a critical point of view, the strategy might lead to a combination of the worst of two worlds instead of the better of two worlds. For instance, attempts to generalize findings that are developed in a multiple variable setting may lead to highly questionable results. Furthermore, the constantly changing design applied in the diverse iterative cycles may problematize the attempt to verify specific hypotheses. And finally, the attempt to include all kinds of variables in the analysis and still identify specific causalities between independent and dependent variables may produce conclusions with low validity.

Given the fact that the present study is drawing on qualitative as well as experimental methodology, I will argue, naturally, that such a combination of different traditions is possible, and, in many respects, also preferable. However, I find the amount of complexity in DBR studies threatening in terms of the quantity of variables involved (see also, Nielsen, 2009). Accordingly, the attempt in the present study is to reduce the number of variables and retain a certain level of consistency throughout the different cycles of the experiment. Naturally, this may lead to occasional inflexibility. Furthermore, my own heterogeneous position as observer, teacher, designer, and interventionist must be taken into account and addressed, for example by the use of triangulation (see Chapter Three).
2.4.3 Closing remarks

It the above, DBR is discussed as a possible mix between qualitative and experimental methodologies. However, as emphasized, such a mix might result in some challenges. Nonetheless, it is important to stress that a basic contrast between partiality and generalizability is not suggested. First, reality is always part of a situation. Thus, it is not the point to indicate that a general and underlying truth exists independently of context and situation. Next, findings produced through local and qualitative investigations might easily represent general implications. Yet, the existence of such general implications cannot just be claimed. Accordingly, the question of generalizability is addressed by the use of relevant aspects of GTM, experimental methodology, and DBR (see chapters three and eleven).

2.5 Actor-network theory

As described in the above, the chosen method results in a number of challenges concerning objectivity versus subjectivity, simplicity versus complexity, and partiality versus generalizability. First of all, actor-network theory is included in the study because it provides a number of interesting and productive perspectives on these matters. Thus, on the one hand, ANT offers an important critical voice in terms of the methodological matrix presented so far. Accordingly, ANT is applied in the study in order to question the urge to categorize, theorize, and generalize. On the other hand, ANT provides an attempt to unite relativism and objectivism and thus construct a platform upon which knowledge can be build. Further, ANT offers a way to include materiality in the study of social behavior and thus potentially bridge the gap between human and technology.

2.5.1 ANT as an alternative conceptualization of the empirical world

Often, ANT is understood as a certain ontological approach suitable for capturing how social and material phenomena are connected in networks. However, according to Latour (the main founder of ANT), ANT is first of all a method designed to explore the world, rather than an attempt to describe the world (Latour, 1999a, 2005). Nevertheless, based on Latour's main points, it is not surprising (and not unreasonable either) that ANT is sometimes applied as an alternative interpretation of the empirical world: one of Latour's main theoretical suggestions is that objects (i.e., pencils, desks, computers, hammers, etc.) play a significant role when it comes to phenomena classified as ‘social’.
Thus, according to Latour, most sociological thinkers tend to ignore the significance and importance of objects in everyday life.

*Much like sex during the Victorian period, objects are nowhere to be said and everywhere to be felt. They exist, naturally, but they are never given a thought, a social thought. Like humble servants, they live on the margins of the social doing most of the work but never allowed to be represented as such. There seems to be no way, no conduit, no entry point for them to be knitted together with the same wool as the rest of the social ties.* (Latour 2005, p. 73)

From an ANT perspective, objects and humans interact in various networks and must accordingly be regarded equally as ‘actors’ (classified as ‘non-human actors’ as opposed to ‘human actors’). Thus, ANT actually does propose an alternative version and interpretation of the world, which makes it reasonable to apply ANT not only as a method (Latour would probably disagree, Latour 2005, pp. 131 & 142). Obviously, the focus on objects offers an interesting perspective on creativity in a technological context (see e.g., Bloomfield & Vurdubakis, 1994; Ingold, 2008; Krogh, 2010). However, the ‘symmetric’ approach to objects and humans (Latour, 2005) is not an attempt to humanise the material world. Rather, ANT suggests that human action is not isolated, but, on the contrary, connected to other human and non-human actions in complex networks. Consequently, according to ANT, a creative individual must be treated as a part of a widespread network, constituted by friends, computers, records, software, musicians, etc., instead of being treated as an isolated island.

*[T]he very word actor directs our attention to a complete dislocation of the action, warning us that it is not a coherent, controlled, well-rounded, and clean-edged affair. By definition action is dislocated. Action is borrowed, distributed, suggested, influenced, dominated, betrayed, translated.* (Latour, 2005, p. 46)

In the light of the above, ANT may lead to a twofold conceptual reduction of individual autonomy. Firstly, by suggesting that non-human actors actually are not just an extension of human will, and, secondly, by suggesting that human action is nothing more than a single link in a long chain of events. Despite this, ANT is not proposing any type of deterministic inspired disqualification of individual autonomy (see the discussion of structuralism below).
Although ANT is not designed to address technological phenomena in particular, it seems appropriate to apply the theory in regard to digitally-based compositional techniques and cultures: often, contemporary music is basically constructed as a mix between different pre-produced musical fragments. As a consequence, the compositional process is most of all characterized by selection among different fragments and options of combinations. Such a description of the creative matrix differs from conventional notions of an autonomous composer, working primarily alone, producing internal emerged original ideas. Thus, ANT may offer an alternative conceptualisation of creativity as it appears in the present study (see also Hennion, 2003 & Ingold, 2008).

2.5.2 ANT as a methodological strategy

According to Latour, ANT represents first of all a number of methodological guidelines for the purpose of studying the empirical world without drawing on simple generalizations and predetermined models (Latour, 2005, p. 142). Among these theoretical strategies I find the following principles and discussions especially relevant.

2.5.2.1 Relativity and objectivism: constructivism and positivism

Latour is suggesting a type of balance between relativity and objectivism I find productive. In order to describe this subtle connection he has suggested an analogy between science and a building site. According to Latour, science can be compared to a construction site in the sense that knowledge is basically a construction (Latour, 1999a, 2005). Thus, Latour indicates that knowledge is relative and not objective. However, according to Latour, a building can be well- or inadequately-constructed. Thus, Latour indicates an objectivist’s, approach in the sense that knowledge, like buildings, can be more or less adequate. He further develops this argument by discussing the very understanding of the word ‘construction’. According to Latour, the meaning of the word is often falsely associated with something untrue. According to this view, either something is real and not constructed or it is constructed and thus ‘artificial, contrived or invented, made up and false’ (Latour, 2005, p. 90). Instead, Latour suggests that objectivity can go hand in hand with constructionism. This doesn’t mean that Latour rejects relativism. Conversely, he embraces relativity. The point is that every perspective depends on a specific standpoint, but that doesn’t mean that this standpoint can’t be improved.
Nevertheless, the question is, how to build the building adequately. Latour’s advice is simply to ‘describe’ the world (Latour, 2005, p. 136). The problem is, of course, that from a constructivist point of view a description is not simply a ‘description’ but rather an ‘inscription’ (Denzin, 1999, p. 212-213). From this perspective, ANT may be criticized for being ‘naive empiricism’ in line with grounded theory. However, Latour still insists that a positivistic approach is not inconsistent with constructivism.

[T]here are two ways to criticize objectivity: one is by going away from the object to the subjective human viewpoint. But the other direction is the one I am talking about: back to the object. Positivists don’t own objectivity [...]. Don’t believe all that crap about being ‘limited’ to one’s perspective. All of the sciences have been inventing ways to move from one viewpoint to the next, from one frame of reference to the next, for God’s sake: that’s called relativity [...]. If I want to be a scientist and reach objectivity, I have to be able to travel from one frame of reference to the next, from one standpoint to the next.

Without those displacements, I would be limited to my own narrow point of view for good. (Denzin, 1999, p. 146)

Consequently, Latour manages to escape from the relativistic trap by claiming that quality of knowledge can be improved throughout continuous cycles of research, an argument also suggested by scientific realists. Hence, good research is equal to ‘good descriptions’ and bad research is equal to ‘bad descriptions’. A scientist is not objective, but still their description of the world may be somewhat objective if the researcher manages to ‘travel from one standpoint to the next’.

Obviously, Latour may be criticized for underplaying the significance of subjectivity, specific interest of power, etc. However, I find the optimistic notion, that investigations of the empirical world are actual possible regardless various types of constructivist objections, quite valuable. I am not suggesting that Latour’s perspective represents a solution of the basic subject/object problem. However, I find that Latour helps in establishing a platform, upon which the researcher might reflect upon his own approach and idiosyncratic perspective without drifting into notions of subjectivity and rivers of deconstruction. Equally, the researcher might focus on descriptions of the world without supporting simple notions of objectivity.
2.5.2.2 Who is the clever one?

Latour criticizes the implicitly or explicitly constructed hierarchy between the researcher and the people that are being investigated. Thus, one of Latour’s main points of critique regarding the ones he designates as ‘social scientists’ (e.g., Bourdieu and Foucault) is that they tend to brand themselves as somewhat more reflective, wiser, and more intelligent than the people they study (Latour, 2005, p. 151). Thus, they are able to analyze and explain human behavior on a certain fundamental level that is not in general realized by the people under study. Bourdieu’s description of doxa is an example of such an approach, in the sense that, according to Bourdieu, a field’s doxa is so taken for granted by the agents in the field that it is almost impossible for the agents to acknowledge the basic rules. Quite oppositely, Latour suggests that the researcher is not more reflective than the people he studies. Rather, it is the other way around. Thus, the researcher must try to learn from the people instead of telling them who they are.

[ANT] won’t try to discipline you, to make you fit into our categories; we will let you deploy your own worlds, and only later will we ask you to explain how you came about settling them. ’The task of defining and ordering the social should be left to the actors themselves, not taken up by the analyst. (Latour, 2005, p. 23)

Presumably, Latour’s objection to the self-confident social scientist is simultaneously political and methodological. On the one hand his argument is built upon a scientific ambition to reach the most appropriate description of the world. On the other hand the argument seems to be a critique of traditional relations of power between people who claim they know better and the ones who believe they know less (see also Latour, 2005, pp. 149-150). From a critical point of view, Latour’s approach may lead to a reduction in the researcher’s privileged position. One may ask, what is really the point of research, if the produced knowledge is neither better nor different from the studied people’s own descriptions? However, the ideological and methodological attempt to respect and include the voice of the actor is valuable. In the current study, the inclusion of the participant’s voice is done mainly through interviews and the inclusion of the participants in the analytical phase, e.g. by the means of peer-to-peer evaluation of the produced music.


2.5.2.3 No structuralism

Latour is a profound critic of structuralism in the sense that the very notion of structuralism deprives the actor of the competence to act. According to Latour, the word ‘actor’ (in actor-network theory) is meant to imply that objects and humans are not just placeholders in a structural system, but on the contrary co-creators and therefore not exchangeable:

\[ \text{An actor that makes no difference is not an actor at all. An actor, if words have any meaning, is exactly what is not substitutable. It’s a unique event, totally irreducible to any other [...]}. \] (Latour, 2005, p. 153)

Accordingly, Latour stresses that humans and objects must be seen as active instead of passive. However, the point is not that general causal relations don’t exist. Rather, the point is that a reduction of a studied object to a plain placeholder seldom is an adequate description. In regard to the current study, one of the risks is that the experimental and deductive approach results in a reductionist and standardized description of the participant’s actions. Thus, ANT might help balance the study between general casual implications on one side and unique events, people, and actions on the other.

2.5.3 Concluding remarks

I find Latour’s approach appealing in the sense that the ideological as well as the methodological implications seems appropriate. Thus, I try to adopt these strategies and intents in this thesis. Nevertheless, as is the case with many researchers, there seems to be a conflict between Latour’s ideology and thoughts on the one side and his own research on the other. First of all, it seems a bit simplistic and contradictory, on the one hand, to suggest that every person is equally reflective and self-conscious, and on the other hand to criticize the social scientist for being neither. One of Latour’s arguments is that descriptions of the world are like buildings that might be decently as well as badly constructed. Therefore, it seems reasonable to also suggest that people’s reflections in general on the world and their own part in it might be more or less appropriate. Evidently, Latour is caught between different positions. On the one hand he is a pure relativist who does not place some statement over another, and on the other hand he claims that the description of the world can be better or worse. On the one hand he does not accept any type of hierarchy and on the other hand he
attacks he community of social scientists and other intellectuals. Accordingly, it seems questionable whether he actually follows the attempt to listen to actors without exception.

On a practical level, ANT equally represents a number of potential problems and dilemmas. First of all the advice just to ‘describe’ may result in an overwhelming amount of data, impossible to comprehend without any kinds of concepts or models. Furthermore, ANT is not adequate for the current study in the sense that specific causalities, related to predetermined categories, frame the initial research question. Accordingly, ANT is applied as a methodological supplement and challenge in regard to the primary approaches chosen, as well as an analytical method to include materiality in the study of human behavior (for further discussions on Latour, see Appendix L).

2.6 Summary and final remarks

In the study, the attempt is to answer a number of specific questions and at the same time maintain an open approach. On the one hand, the methodological design is inspired by deductive research logics and experimental studies. On the other hand, the tools of research are provided by qualitative methodologies. In the chapter a mixed approach is described that includes GTM, experimental methodology, DBR and ANT. During the introduction of these traditions, important methodological dilemmas have been discussed. Some of these discussions have resulted in methodological choices and strategies. Other discussions have not resulted in unambiguous solutions, but may be seen as dilemmas and concerns I have to pay attention to throughout the study (see table below).

<table>
<thead>
<tr>
<th>Table 2.5 Decisions and concerns</th>
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</thead>
<tbody>
<tr>
<td><strong>Decisions</strong></td>
</tr>
<tr>
<td>The study is essentially qualitative, supplemented with quantitative and experimental strategies.</td>
</tr>
<tr>
<td>The investigation moves in iterative circles containing elements of deduction and induction.</td>
</tr>
<tr>
<td>The study includes a semi-experiment.</td>
</tr>
<tr>
<td>The study includes explorative qualitative investigations.</td>
</tr>
<tr>
<td>The ambition is to describe the world as correctly as possible.</td>
</tr>
<tr>
<td>The ambition is to produce formal theory according</td>
</tr>
<tr>
<td>Activity</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>The study is inspired by design-based research.</td>
</tr>
<tr>
<td>The investigation also addresses non-human actors.</td>
</tr>
<tr>
<td>The investigation is inspired by Latour and his advice to listen to the actors.</td>
</tr>
<tr>
<td>The investigation is inspired by Latour and his rejection of structuralism.</td>
</tr>
<tr>
<td>The researcher’s idiosyncratic dispositions must be self-monitored.</td>
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</table>
Chapter Three: The design

In Chapter Two the methodological framework was constructed and discussed. In the present chapter the concrete design of the project will be outlined. The design includes different phases and strategies. However, most of the chapter will be directed at the third phase of the project as this phase represents the core of the thesis and provides the main empirical material for the analysis in Chapter Ten and Chapter Eleven.

3.1 An overview of the study design

The relationship between musical competence and creative behavior within a digital technological context was explored in three different ways:

- Three iterative cycles of case studies: first phase, second phase, and third phase
- DBR projects and field studies in public schools
- Explorative interviews with professional producers, artists, and composers.

3.1.1 The case studies

The three phases of case studies form the main part of the study. The case studies consisted of a number of music-technology courses, within which the participants received some basic instructions, and in turn composed music partly with the use of a computer. Musical novices and experts were recruited and separated into groups according to their level of experience. The music produced was evaluated by other groups of people, including musical novices and experts. The music course was conducted in different variations, in different institutions, and with different groups of young people.

The study was divided into three general phases in order to develop, explore, and test hypotheses about learning and creativity, and yet produce empirical material that was comparable from an experimental point of view. The first phase included the initial explorative case studies that were conducted before I became enrolled as a PhD student (Boysen, 2010b, 2010c). These studies include twenty-three students from the University College Zealand (UCSJ) and the School of Tuse. The second phase included a number of semi-experimental and non-experimental case studies.
meant for the exploration and development of hypotheses, didactical designs, and data collection methods. These studies included twenty-three students from the UCSJ, the Little School of Holbæk, and the School of Tuse. The third phase included a number of semi-experimental case studies carried out with a relatively fixed procedure intended for comparison. These studies included fifteen participants recruited from UCSJ, the School of Rhythmic Music in Vig, and the Royal Academy of Music. The first phases of the study were mainly flexible and explorative, whereas the last phase of the study was more fixed and deductive (see Chapter One).

The development of hypothesis was based on the entire volume of case studies. However, the last and relatively fixed phase constitutes the main focus for systematically analysis. In this phase, the participants were divided into three groups according to their musical experience.

<table>
<thead>
<tr>
<th>Table 3.1 Participants in the third phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Novices</td>
</tr>
<tr>
<td>Julie</td>
</tr>
<tr>
<td>Steffen</td>
</tr>
<tr>
<td>Casper</td>
</tr>
<tr>
<td>Trine</td>
</tr>
<tr>
<td>Katrine</td>
</tr>
</tbody>
</table>

The music course in the second and third phase consisted of six sessions. In the first five sessions the participants were given rather closed tasks, and in the final session the task was rather open. In the first five sessions the participants were in general working in pairs. Every session took approximately one hour. In the last session the participants were working alone for approximately ten hours.

The produced music was subsequently evaluated. In the second and third phase the students evaluated each other’s music that had been produced throughout all the sessions. Moreover, the final individual compositions in the third phase were assessed systematically by evaluation groups. These evaluations were blind in the sense that the composer’s identity was concealed from the evaluation group.

3.1.2 DBR projects and field studies in public schools
As a supplement to the case studies presented in the above, the design also included other types of studies conducted in schools. The first one was basically a field study, in the sense that I followed a
group of children and their teacher during a three week long music-technology course. The second one was essentially a DBR project in the sense that I investigated different forms of didactical designs in collaboration with a local teacher and her class (Boysen, 2013b). There are several reasons for the inclusion of such studies: first, these projects represent a more naturalistic approach, which serves as a counterpoint to the case studies, which were partly laboratory based. Second, I occupied a relatively anonymous position in these studies which gave me the opportunity to be more observational. Finally, I had the chance to study creative processes among children of different ages. Whilst young people, not children, are the main focus in this study, I still seek to explore the role of expertise in many different environments and among different groups of people (as argued in Chapter Two). The studies were conducted in two schools:

- Field study at the School of Tuse: Thirty-five children aged ten and eleven were working creatively with composition for three weeks, 2012.
- DBR project at the School of Vemmelev: Eight children aged six and seven were working creatively with composition for one week, 2013.

3.1.3 Interviews with professional producers and composers

The studies outlined in the above were supplemented by interviews with a number of professional musicians, producers, and artists. There are several reasons for this. First of all, the point of this thesis is to investigate the implementation of expertise. Only young people participated in the case studies. Therefore, the amount of experience is confined by natural factors. The professionals, on the other hand, have at least twenty years of experience within the domain. Second of all, they are considered creative in a social field. Accordingly, they offer an opportunity to explore creativity on a professional level (see the demarcation and graduation of creativity in Chapter Four). The interviewed people were:


• Louise Nipper (b. 1978): Composer and producer. Louise owns the music studio Sound Scape and has worked with a huge number of artists, including Sebastian, Carpark North, and Claus Hempler. Further, Louise Nipper, alias Alouise, has released three solo-albums containing her own material. See, http://www.alouise.dk/

• Jan Eliasson: Producer. Jan has been one of the most popular mastering producers in Denmark during the last three decades. He has cooperated with the majority of the famous Danish pop/rock musicians and mastered most of the popular and respected Danish records. Today he owns the sound studio Audioplanet and work on a daily level with people like Remee, Thomas Troelsen and former members of Aqua. See, http://audioplanet.dk/

Furthermore, a number of informal interviews were conducted with students and former students of the Royal Academy of Music in order to investigate the influence of education with regard to creativity and expertise.

3.2 The case studies in the first and second phase

In their first two phases, the case studies represent the first cycles in the on-going iterative processes discussed in the previous chapter. Thus, the purpose of the initial case studies was double. Firstly, they sought to provide empirical data for the purpose of developing hypotheses regarding creativity, competence, and learning. Secondly, changes and refinements were made from one case study to the next in order to test and explore the design of the music course and the data collection methods applied from a didactic as well as a research perspective.

In the table below the case studies of the first and second phase are listed. The table also includes information about the type of case study, the technology applied, and the method of data collection. Accordingly, it is possible to see how the design developed during the two first phases.
### Table 3.2 The first two phases of case studies

<table>
<thead>
<tr>
<th>Case studies</th>
<th>Institution and participants</th>
<th>Type of case study</th>
<th>Technology: software and hardware</th>
<th>Data collection method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The first phase</strong></td>
<td></td>
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<tr>
<td>Case study one 2006</td>
<td>Students from University College Zealand, Social Education: Anja, Janne, Maria, Christian, Charlotte, Anders, Pia-Marie, Maibritt 1, Britt, Maja, Maibritt 2, Julie and Lotte.</td>
<td>Composition alone and in groups of three to four students. Approximately four hours of composition for every student divided into two sessions.</td>
<td>Music-software: Logic</td>
<td>Participant-observation Video-observation Interviews Final compositions Logic-files</td>
</tr>
<tr>
<td>Case study two 2009</td>
<td>Pupils from School of Tuse, 11th grade: Caroline, Anna, Selma N, Selma E, Lucca, Mie, Laura, Katrine, Fie and Ida</td>
<td>Composition in pairs. Mie is the only participant with instrumental competence. Approximately 1 hour of composition for every pupil.</td>
<td>Music-software: Logic</td>
<td>Participant-observation Video-observation Interviews Final compositions Logic-files</td>
</tr>
<tr>
<td><strong>The second phase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case study three 2011</td>
<td>Students from University college Zealand, Social Education: Trine, Linea, Charlotte, Niels, Martin and Jakob.</td>
<td>Primarily individual composition. Trine, Charlotte, Niels and Martin had instrumental competence. Jakob and Linea did not. The case study was divided into six sessions: five sessions of one hour and the last session approximately ten hours. The students evaluated each other’s compositions.</td>
<td>Music-software: GarageBand</td>
<td>Participant-observation Video-observation Interviews Final compositions GarageBand-files The last session was not videotaped.</td>
</tr>
<tr>
<td>Case study four 2012</td>
<td>Pupils from Little School of Holbæk from the 9th grade: Therkel, Christian, Nikolaj, Laust, Sarina, Caroline, Anna, and Nathalie.</td>
<td>Composition alone and in pairs. Therkel, Laust, Nathalie and Anna had instrumental competence. Sarina, Christian, Caroline and Nikolaj did not. The case study was divided into six sessions: Five sessions of one hour in pairs and the last session approximately ten hours of individual work. The students evaluated each other’s compositions.</td>
<td>Music-software: GarageBand</td>
<td>Participant-observation Video-observation Interviews Final compositions GarageBand-files The last session was not videotaped.</td>
</tr>
<tr>
<td>Case study five 2012</td>
<td>Students from University College Zealand, Social Education: Approximately 30 students participating in a conference about computer, profession and gender.</td>
<td>One session of composition of one hour in groups of three. The students evaluated each other’s compositions.</td>
<td>GarageBand Loops</td>
<td>Participant-observation Student-observation (students make observations of each other’s sessions) Video-observation</td>
</tr>
</tbody>
</table>
Case study six  
2012  
Pupils from School of Tuse, 4th grade: Lucca and Caroline  
One session of composition of one hour in a pair.  
GarageBand Loops  
Participant-observation  
Video-observation  
Interview  
Final compositions  
GarageBand-files

Evaluation one  
2012  
Students from SDU, Master: eight students.  
Evaluation of music produced in the other case studies.  
Questionnaires  
Group interview  
Participant-observation  
Sound-recording

Case study seven  
2013  
Students from University college Zealand, Social Education: Line, Camilla, Jukas, Muntaz and Tina  
Composition alone, in pairs and groups of three. Jukas, Camilla and Line had instrumental competence. Tina and Muntaz did not. The case study was divided into five sessions: of one hour. The initial two sessions were conducted in pairs/groups and the last three alone. The students evaluated each other’s compositions.  
Music-software: GarageBand Loops  
MIDI-keyboard  
Effects  
Participant-observation  
Student-observation  
(students make observations of each other’s sessions)  
Video-observation  
Screen-recordings  
Interviews  
Final compositions  
GarageBand-files

Evaluation two  
2013  
Students from University College Zealand, Social Education: Approximately 20 students  
Evaluation of music produced in the other case studies.  
Group interview  
Participant-observation  
Sound-recording

Case study eight  
2013  
Students from University College Zealand, Social Education: Louise and Mads.  
One session of composition of one hour. Jonas had instrumental competence. Louise did not. The students evaluated each other’s compositions.  
Music-software: GarageBand Loops  
Participant-observation  
Video-observation  
Screen-recordings  
Interviews  
Final compositions  
GarageBand-files

In order to provide empirical data that is comparable from an experimental point of view, a consistent design must be constructed. In other words, the listed case studies were valuable from a qualitative perspective but less valuable from an experimental perspective in the sense that comparisons between the case studies were problematized by the on-going changes made regarding
the shape of the music course and the data collection methods applied. Still, these cases are important in order to understand the reasons for the choices made in regard to the design in the third phase. Thus, in the following discussions of the semi-experimental case studies in the third phase, references will be made to findings and experiences generated in the first and second phase (see table 3.2)

### 3.3 Design of the case studies in the third phase

There are a number of questions to consider in relation to the design of the case studies in the third phase. The issues are roughly outlined in the table below.

<table>
<thead>
<tr>
<th>Category</th>
<th>Issues of concern</th>
<th>Type of questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The participants</td>
<td>Recruiting</td>
<td>Which variables to include and how to include them?</td>
</tr>
<tr>
<td>The music course</td>
<td>Technology</td>
<td>Which type of technology is most suited for the study?</td>
</tr>
<tr>
<td></td>
<td>Instruction</td>
<td>What to tell the participants? How to respond to the participants questions?</td>
</tr>
<tr>
<td></td>
<td>The tasks</td>
<td>How to promote creativity?</td>
</tr>
<tr>
<td></td>
<td>Size of groups</td>
<td>What are the implications of group size in terms of creativity?</td>
</tr>
<tr>
<td></td>
<td>Time frame</td>
<td>What is realistic? What is appropriate?</td>
</tr>
<tr>
<td>Data collection method</td>
<td>Video observation</td>
<td>How to produce subtle data without interfering too much with the didactical setup?</td>
</tr>
<tr>
<td></td>
<td>Interview</td>
<td>Which questions to ask in order to capture creativity?</td>
</tr>
<tr>
<td></td>
<td>Computer files</td>
<td>What type of data is needed?</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Recruiting</td>
<td>How to form the evaluation group?</td>
</tr>
<tr>
<td></td>
<td>Questionnaire</td>
<td>How to construct the questionnaire in order to capture important information without tiring the evaluation group?</td>
</tr>
</tbody>
</table>

When considering the questions implied in the table above it is obvious that the dilemmas are strongly connected to the strategy of mixed methods. Thus, the balance between experimental approaches, qualitative methodology, and design-based research entails a number of concrete problems.

### 3.3.1 The balance between an experimental and a naturalistic setting

From an experimental perspective the design must in general be fixed and controlled. Accordingly, as in a typical laboratory experiment, the researcher must control the recruiting of participants, the equipment applied, the instruction, the tasks, the size of the groups, etc. Further, the procedures must be kept constant and unchanged throughout the research. Conversely, from a qualitative perspective, the design must preferably resemble a naturalistic setting. Accordingly, the procedures
are not meant to be fixed and defined beforehand. Rather, the design must vary with respect to the context, the specific participants, the interaction between teacher and student etc.

| Table 3.4 The balance between a naturalistic setting and a laboratory experiment |
|---------------------------------|---------------------------------|
| **Recruiting**                  | Laboratory experiment          | Naturalistic setting          |
| Specific participants are recruited | No specific participants are recruited |
| **Technology**                  | Specific technology is applied in all the case studies | Different types of technology might be used depending on the students and the context |
| **Instruction**                 | A fixed and limited instruction is applied | Instruction consists of flexible dialog and interaction with the students |
| **The tasks**                   | Fixed tasks meant for hypotheses testing | Tasks might vary depending on the students’ idiosyncratic perspectives and motivations |
| **Size of groups**              | Individual work is necessary in order to isolate expertise on an individual level | Groups size might vary according to the situation, the context, the interaction between participants, etc. |

On the one hand the case studies in the third phase are similar to experiments in the sense that the recruiting is controlled, the technology is chosen a priori, the instructions are fixed, and the tasks and the size of groups are decided beforehand. On the other hand the technology is relatively flexible, the fixed instructions do not hinder other forms of dialog, and the tasks are open-ended. Accordingly, the case studies consist of fixed as well as flexible elements even though the setting may in general be considered quite experimental. Further, it must be stressed that the first iterative cycles of research, represented by first and second phase, are essentially inductive. In Appendix N, the construction of the design is discussed thoroughly and examples from first and second phase are included. In the below the most important aspects of the design is presented and discussed.

### 3.3.2 Recruiting

As described in Chapter Two, the selection of subjects represents a methodological challenge from an experimental point of view because we cannot secure initial equivalence between the groups of participants. Furthermore, we cannot control the independent variable in the sense that instrumental music training might be achieved in many ways (Evans & Rooney, 2008, p. 195).
3.3.2.1 Alternative ways to establish causality

Without initial equivalence we cannot conclude whether or not differences between the groups are caused by the independent variable (i.e. learning to play an instrument) or by other factors. We may find a correlation between the level of expertise and the type of creative behavior. However, we cannot conclude that the correlation is causal. The correlation might only be statistical. The uncontrolled factors are endless, e.g. socioeconomic factors, biological factors, psychological factors etc. Consequently, we cannot conclude whether a specific type of behavior is caused by one specific factor, or another, or (more likely) many factors in combination. However, according to experimental methodology in general, it is more or less possible to eliminate challenging hypotheses, and thus, establish a causal relation between the dependent and the independent variable (X).

Insofar as the natural instances of X vary among each other in their other attributes, these other attributes become less plausible as rival hypotheses. Correlations of a fairly impressive nature may thus be established [...] (Campbell & Stanley, 1963, p. 64)

This means, that causality between expertise and a specific type of creative behavior may be established, if there is a correlation between the two variables AND no systematic relation between expertise and other identified factors. Accordingly, we cannot establish a simple causality, if we also find a systematic correlation between expertise and gender, or expertise and the socioeconomic background, or expertise and age, etc. This methodological principle must be addressed through the selection of the subjects as well as in the analysis. This means that we have to consider which type of factors we must include as possible alternative influential factors. If we, for example, include gender and socioeconomic background as possible influential factors, we have to find a way to examine or eliminate possible correlations between the dependent and the independent variable and the two challenging variables. This can be done in several ways. We can choose to include only males from a specific socioeconomic segment in the experiment. Thus, if we find differences between the two experimental groups, we can eliminate gender and socioeconomic as influential factors.

However, the strategy outlined in the above makes it impossible to examine many different types of correlations. Furthermore, the experimental setting would differ strongly from a natural setting and
therefore be less representative (e.g., Wiersma & Jurs, 2005, p. 103). Another approach is to implement alternative influential factors in the design. This can be done by selecting subjects with specific attributes in addition to the variable of primary interest. This kind of purposeful sampling can enable an information-rich material that can be studied on a qualitative and a quantitative level, applying methods inspired by multiple correlation analysis (Wiersma & Jurs 2005, pp. 311-313; Evans & Rooney, 2008, p. 211; Leary, 2008, pp. 240-242). Accordingly, two groups may be selected chiefly on the basis of the variable of primary interest and secondly on the basis of other alternative variables.

3.3.2.2 Variables addressed

However, the question is which type of alternative predictor variables needs to be addressed in the current study. First of all, it is important to note that a variable can hardly be considered unimportant a priori. Furthermore, it is a typical positivistic approach to seek to split up a human into different variables – an approach often criticized from a qualitative point of view. Thus, in the current study, nothing, regarding the subjects, is considered insignificant. Nevertheless, in the selection of subjects, every imaginable and unimaginable factor cannot be taken into account. In the design, the methodological dilemma is addressed through the explained balance between qualitative and quantitative methods. On one hand, this means that the observations and the interviews make it possible to explore and study unexpected predictor variables. On the other hand, the study is designed to address specific questions, which means that preselected variables must be considered in the design.

The first variable considered was gender. In qualitative as well as quantitative research, questions of gender are often incorporated in the design. Basically, this is due to the fact that differences between genders play a rather important role in society (Lie, 2003; Bray, 2007). However, in the present study, I did not wish to reproduce stereotypes about gender. On the other hand, I still wanted to take possible differences between the sexes into account. In the second phase of the case studies I investigated questions of gender systematically (Boysen, 2014) (see also Appendix J). The result was rather ambiguous in the sense that some differences were found but they didn’t represent any significant differences in the bounds of this study (Boysen, 2004). Subsequently, the gender issue seemed less relevant to pursue. Accordingly, the case studies in the third phase include both genders but are not completely balanced in terms of gender.
Secondly, I addressed a number of variables concerning the background of the participants. Thus, in the final interview, I asked the participants about their background in broad terms. I focused on (1) the musical environment in which the participants were brought up, e.g. the musical traditions in their family and the musical competence and habits of their parents, (2) socio-economic factors, e.g. their parents’ socio-economic status, education, profession, and the places the participants have been brought up, (3) the participants education and their experience with (and approach to) schools and education in general, e.g. whether they feel comfortable in the educational system, if they feel like a success or a rebel, etc. Again, I am rather ambivalent in regard to these types of questions. On the one hand, I feel bad about the possible danger of reproducing stereotypes about the correlation between creative potential and socio-economic backgrounds, educational achievements, etc. (Florida, 2002; Hansen, 2004) On the other hand, some of the case studies in the second phase imply that these types of relations might be relevant to pursue (see Appendix J).

A variable that I did not systematically address is different types of personalities. For instance, I did not implement personality tests, neither did I seek to categorize the participants as reflector, activist, etc. (see fx Dunn & Dunn, 1999). The reason for this is double. Firstly, an approach like this is highly quantitative and the notion that a person’s behavior can be summarized and categorized in simplistic terms is very problematic. Secondly, an approach like this would complicate the design severely. However, this doesn’t mean that I reject the fact that the participant’s behavior can be explained as a part of their general approach to learning and creative work, rather than their musical competences and background. Thus, these questions were pursued on a qualitative level in the design, simply by asking the students to explain and exemplify their general approach to creative work. I must stress, that these types of question were not intended to establish some general causalities between personality and creative behavior. If that was the case, this type of relation would be examined in the semi-experiment by recruiting participants with specific personality profiles.

3.3.2.3 The main variable: How to define expertise?

In the recruiting process, comprehensive instrumental skills were understood as an indicator of musical expertise. Naturally, this is a rather simplistic understanding in the sense that musical expertise might take many forms. However, there are several reasons for this assumption:
• I needed a measurable indicator of competence in order to conduct systematic recruiting.
• Practicing a musical instrument for many years will inevitably lead to some kind of musical expertise.
• The explicit role played by the body when practicing an instrument may result in a certain kind of automated knowledge that may be relevant to the project (see Chapter Six).

Nevertheless, it is important to address a number of issues concerning the measurement of expertise. First of all, it is not the intention to claim that musical expertise is the same as instrumental skills. For instance, a reviewer of music possesses a comprehensive amount of domain-specific knowledge even though he has no instrumental training. Thus, expertise includes on the one hand skills traditionally acquired through formal education or informal learning, e.g. with respect to theory, method, technique, and craftsmanship. On the other hand, expertise also includes knowledge about music acquired through other types of activity in the social field.

Naturally, this variable could have been even more specific. In other words, I could have chosen participants who played a specific musical instrument, were part of a specific community of practice, or had the same music-educational background. Nonetheless, the relatively inclusive version of the variable was chosen for two reasons:

• The ambition of the research is to investigate expertise in many forms and not only as part of a specific tradition connected to specific instruments or genres.
• The study is basically explorative and I have not yet build up any specific hypotheses that would justify a theoretical sampling within a limited substantive area (see Chapter Two)

3.3.3 Technology
GarageBand was chosen as the main software. In the first phase of the case studies, other types of software were tested, including Logic and Cubase. However, GarageBand proved to be preferable because it contains different platforms and features that can be used by novices as well as experts. Thus, even though specific technology was chosen, there was still room for the participants’ idiosyncratic approach and level of expertise (see chapters eight and nine).

Most importantly, GarageBand includes loops as well as MIDI. Loops allow the composer to build up music by the use of pre-recorded audio. Thus, novices are able to make music in a hurry without
comprehensive instructions. MIDI, on the other hand, allows the composer to play and design melodies, harmony, and rhythm. Thus, the experts are able to use their musical experience explicitly in the process of composition.

The software is supplied by a MIDI keyboard and a microphone. Accordingly, the composer is also able to record different kinds of musical instruments and voices.

3.3.4 The instruction

In relation to the music course, the participants received instructions regarding basic tools in GarageBand. Naturally, these instructions may have had an impact on the participant’s behavior and directed them in specific directions. Therefore, the initial instructions were limited to a minimum: essentially, I showed the participants how to use some basic tools that were relevant with respect to the given task. The instruction was also printed on paper and distributed. These papers functioned as a potential guideline for the participants during the sessions. At the same time, it helped me to structure and replicate the instructions relatively systematically and consistently.

In the following table, the basic instructions are described. The three initial instructions are strictly organized in the sense that the participants are guided through fundamental features and techniques. The succeeding three sessions were not initiated with a prepared instruction, but rather a dialog
between the instructor and the participant, exploring the equipment on the participant’s terms.

Accordingly, the attempt was to balance between deductive and inductive didactical approaches.

### Table 3.5 The basic instructions applied (some of the formulations are adopted from the GarageBand Manual, 2009)

<table>
<thead>
<tr>
<th>Session</th>
<th>Description</th>
</tr>
</thead>
</table>
| First session  'Working with loops' | • Listen to the sound in the loop browser by clicking the blue button on the right side of the loop.  
• Choose a loop by dragging the loop from the loop browser to an empty part of the timeline where there is no track.  
• Repeat the loop by selecting it and click the cmd key and the c key. Then click the key cmd and the key v.  
• Delete the loop by selecting the loop and click the backspace key.  
• Shorten or lengthen a loop by moving the pointer over the lower part of either edges of the loop. The pointer changes to a resize pointer, with an arrow pointing away from the region. Move the pointer left or right.  
• Change the tempo by clicking the icon on the left side of the LCD and choose Project. Then click the number below the word Tempo. Finally, drag the slider up or down to a new tempo.  
• Change a track’s volume level in the track’s header by dragging the volume slider left to lower the volume level, or drag it right to raise the volume level. |
| Second session  'Working with the MIDI-keyboard' | • Connect the USB cable to the keyboard and to the computer.  
• To add a new Software Instrument track, choose Track > New Track. Click Software Instrument in the New Track dialog, then click Create.  
• A new Software Instrument track with a Grand Piano instrument appears in the timeline, and the Track Info pane opens to the right of the timeline.  
• In the Track Info pane, select an instrument category from the list on the left, then select an instrument from the list on the right.  
• Test the sound by playing the MIDI-keyboard  
• Select a track by clicking the track’s header  
• To start recording, click the Record button.  
• Repeat and delete a sequence (i.e. a region) exactly the same as with the loops (see first session)  
• To enhance the timing of a Software Instrument track: double-click the header of the Software Instrument track to open it in the editor. Select the regions in the track you want to enhance. From the Enhance Timing pop-up menu, choose the note value you want to use to enhance the timing of the selected items. If you want timing enhancement to be less than full strength, drag the Enhance Timing slider to the left to set the amount of enhancement. If you don’t like the results after you enhance the timing, drag the Enhance Timing slider to ‘off’ to return the selected items to their original timing. |
| Third session  'Working with loops, MIDI-keyboard and effects’ | • To add an effect, click the Track Info button. The Track Info pane opens to the right of the timeline. Click Edit to show the track effects. Choose an effect from one of the empty effect slots.  
• To turn on an effect, click the on/off button (with a rectangle in the center) in the Track Info pane, to the left of the effect name. Click the on/off button again to turn the effect off.  
• Choose a new effect preset from the Preset pop-up menu below the effect’s name.  
• To edit an effect preset, click the Edit button (with a graphic for the effect) to the left of the effect name. The effect’s Preset window appears. Each effect setting has a slider, button, or other control, which is labeled to indicate its purpose. Drag the sliders in the Preset window to adjust the settings for the preset. |
| Fourth session  'Working freely with GarageBand’ | • Repetition  
• Dialog  
• Exploration of the features in GarageBand, based on the participants interests, questions, wishes and strategies |
| Fifth session | • Repetition |
### 3.3.5 The formulation of the tasks

In phase one and two of the case studies different types of tasks were applied. The formulation ‘make some music that you think is good’ was used most of the time. There are a least two reasons for this choice of words. Firstly, the ambition was to make the students take the task seriously and not distance themselves from the music they were composing. Secondly, the task had to be relatively open-ended in order to give room for the participants’ idiosyncratic perspectives.

Nonetheless, different tasks were applied in order to test the effect of the initial wording. First of all experiments were made with formulations like ‘make something crazy’ or ‘make something fun’. These types of tasks were inspired partly by research conducted by Amabile that suggests that a formulation like ‘make something crazy’ results in outcomes that are evaluated relatively positively (Amabile, 1996). Further, experiments were made with close-ended tasks such as ‘make some music for a horror movie’. Finally, the participants were partly involved in the formulation of the tasks, especially in the second phase.

The results of the experiments were rather ambiguous (see Appendix N). In short, the close-ended tasks were quite often rather motivating and easy to handle for the participants. However, it seems like the music produced for these tasks was less personal. The task-formulation ‘make something crazy’ seemed to promote a feeling of liberty among the students that often entailed the production of norm-breaking music. However, they generally did not consider the music produced in this way valuable. The participants’ taking part in the formulation of the tasks seemed to generate an increased interaction between the students. However, sometimes they felt demotivated and bewildered by their peers’ (sometimes highly complex) tasks.

From a qualitative perspective, the tasks may depend on the specific participants and differ from case to case. However, from an experimental point of view, the tasks have to be relatively
consistent. The balance is obtained through a design, where the task formulation ‘make something good’ is applied in the first three sessions, the formulation ‘make something crazy’ is applied in the fourth session, the task in the fifth session is formulated by the participants, and finally the formulation ‘make something good’ is repeated in the sixth session.

<table>
<thead>
<tr>
<th>Sessions</th>
<th>Formulation of task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Session</td>
<td>‘Make some music that you think is good’</td>
</tr>
<tr>
<td>2. Session</td>
<td>‘Make some music that you think is good’</td>
</tr>
<tr>
<td>3. Session</td>
<td>‘Make some music that you think is good’</td>
</tr>
<tr>
<td>4. Session</td>
<td>‘Make some crazy music’</td>
</tr>
<tr>
<td>5. Session</td>
<td>‘Make the task yourself’ – this task may frame the participants own work or be presented for other participants.</td>
</tr>
<tr>
<td>6. Session</td>
<td>‘Make some music that you think is good’</td>
</tr>
</tbody>
</table>

### 3.3.6 The size of the groups

The case studies in the first and second phase used different sizes of groups. The students worked alone, in pairs, and in groups of three and four. The different sizes of groups have pedagogical implications as well as research-related implications.

First of all, the case studies included individual work because the object of the investigation is to examine how an individual’s idiosyncratic level of expertise is related to creativity. Sheer group work would complicate such a purpose. However, group work might be valuable for didactical as well as research-related reasons. First of all, group work seems to promote unique types of creative processes (see Appendix N). Secondly, group-work allows the researcher to monitor the ongoing and informative dialog between the group members. In other words, the recorded dialogs may serve as a window into the students’ way of thinking. Accordingly, the design included individual as well as group-work: the first five relatively short sessions included mainly group-work and the last and relatively long session included only individual work. The last session formed the main empirical material to be analyzed in the fifth part of the thesis.
When the participants worked in pairs, the nature of the social interaction was quite different from the interaction in groups of three. In pairs the students listened to each other’s suggestions and often there appeared to be a high degree of consensus in the group. On the other hand, work in groups of three often included conflicts promoted by different ideas and strategies within the group (for instance, case study number three and case study number eight, see table above). This lead to a very dynamic creative process with a lot of discussion and argument. However, often it seemed like the conflicts became counterproductive (see Boysen 2013b). Accordingly, in the case studies in the third phase, the triple groups were excluded and instead the participants worked in pairs in sessions one to five.

### 3.3.7 Evaluation groups

In order to address creativity from a sociological perspective, the study included evaluations conducted by various groups of people. The members of the evaluation groups were recruited according to the following criteria. Firstly, the compositions were evaluated by groups of people similar to the recruited composers in terms of age and local community. The assumption is that music may communicate and implement specific codes of meaning that may be understood more directly or completely by the members of a specific community (e.g., Middleton, 1990, pp. 174-244, Tagg, 1992; Csikszentmihalyi, 1996, pp. 23-31). Secondly, the compositions were evaluated by musical novices as well as experts. Thus, the implications of musical knowledge on creativity were not only investigated through the design of the case studies but equally through the design of the evaluation. The evaluation is blind in order to avoid the influence of extra-musical issues (see Appendix N).³

The evaluation was conducted in two steps. Firstly, the evaluation group filled out a questionnaire individually. Secondly, a group discussion was facilitated. The point was to address individual as well as social constructions of aesthetic preferences, taste, etc. Furthermore, this procedure enabled a balance between an explorative inductive approach and a deductive approach (see e.g., Krogstrup, 2001, pp. 96-105).

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³ In general the use of evaluation groups in this study is related to the use of focus groups as described by Janet Smithson, for example with regard to the role of the interviewer and the size of the groups (Smithson, 2008, pp. 358-362).
The questionnaire was divided into two main sections. In the first section the point was to generate qualitative data and in the second the point was to generate quantitative data. In the first part, the members were asked to describe and judge the music as if they were writing a review. Further, I asked them to point out the most intriguing and the least intriguing musical elements. The purpose was double. One, I needed to know how they interpreted the music in order to investigate the communication from sender (the composer) to receiver (the member of the evaluation group). In other words, it was important to know whether the receiver’s understanding of the music was somehow similar to the sender’s. Two, I needed them to judge the music on a detailed level because the ambition in the thesis partly is to track creative processes on a micro scale. In the second part of the questionnaire, the members were asked to judge the music on a rating scale from one to ten with regard to the three categories, ‘originality’, ‘value/craftsmanship’, and ‘final judgement’. The three categories were based on the theoretical framework applied (see Chapter Four). The rating scale provides information that can be used partly quantitatively.

In a questionnaire it is important to avoid words with ambiguous meanings (Krosnick & Presser 2010, p. 264). Consequently, it might represent a problem to use the categories ‘originality’ and ‘value/craftsmanship’ in the sense that such terms are partly derived deductively from the theoretical framework. Accordingly, members of the evaluation groups as well as the participants in the case studies frequently questioned the meaning of these terms (see for example case study number four, appendix J). However, by combining the questionnaire with a group discussion it is possible to clarify, negotiate, and investigate different understandings of the applied terms (see also Leeuw, 2008, pp. 317-324).

The evaluation groups included students aged between 19 and 27 from UCSJ. Among these students, Mads, Kåre, Nanna, and Karoline were skilled musicians. The rest were not.

Group one: Kåre, Simon A, and Anastasia
Group two: Jonas Mads, Louise, Fie, and Nynne
Group three: Stine, Line, Natascha, Charlotte
Group four: Nanna, Noa, Tenna, Katrine, and Simon B
Group five: Karoline, Naya, Michelle, Grith, Kristine, Nanna, and Tanja
3.3.8 Data collection methods

Essentially, the data collection methods were triangulated in the sense that different approaches were applied (see also Appendix B, C, D, E and F). However, in the first and second phase of the case studies, I experimented with different data collection methods. The point was to explore which type of data collection that produces the most appropriate and subtle empirical material with respect to the key research questions. In general, this attempt has resulted in an ongoing expansion of data collection methods (see table 3.7).

<table>
<thead>
<tr>
<th>Table 3.7 Data collection methods applied in the case studies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Case study number one and two</strong></td>
</tr>
<tr>
<td>Videoobservation from the side</td>
</tr>
<tr>
<td>Videoobservation from the front</td>
</tr>
<tr>
<td>Screen-recording</td>
</tr>
<tr>
<td>Videoobservation during every session</td>
</tr>
<tr>
<td>Participat observation</td>
</tr>
<tr>
<td>Interview</td>
</tr>
<tr>
<td>Interview with the usage of drawings</td>
</tr>
<tr>
<td>Logic files</td>
</tr>
<tr>
<td>GarageBand files</td>
</tr>
<tr>
<td>GarageBand files saved every hour in the six sessions.</td>
</tr>
<tr>
<td>The compositions</td>
</tr>
<tr>
<td>Mutual evaluations</td>
</tr>
</tbody>
</table>

The reasons for some of the most vital changes and developments regarding the data collection methods are discussed in Appendix N. However, in the following, the design of the final interview in the case studies will be discussed in breif. (For discussions on videoobservation, see Alrø & Dirckinck-holmfeld, 1997; Møhl, 2003. For discussions on screen-recording, see Seddon & O’Neill, 2003).

3.3.9 The final interview

The final interview was semi-structured and included inductive as well as deductive elements (see interview guide, appendix A). The interview was inductive in the sense that the purpose was to explore creativity without predefined categories. Simultaneously, the interview was deductive because the questions were partly based on the theoretical framework and the hypotheses.
constructed in the first and second phase of the study (for discussions on the semi-structured interview, see e.g., Dahler-Larsen, 2002; Brinkmann & Kvale, 2009, pp. 41-50). In the interview, creativity was investigated on a macro and a micro scale. On the one hand I asked the participants to describe main categories of work and define different types of processes. On the other hand I asked the participants to describe the birth of a creative idea on a detailed level.

In order to generate the most subtle knowledge I have developed a number of useful tools (see also Fontana, 2002; Leeuw, 2008, pp. 317-318; Brinkmann & Kvale, 2009, pp. 166-167). First of all, the interview was conducted in front of the computer. Thus, the composer and I were able to look at their composition as it appeared in the GarageBand interface. Further, we were able to listen to specific sections of the music. Second of all, I asked the participants to draw pictures of the outcome and the process of composition. This technique promoted a thick description of creative processes (see Chapter Two, section 2.2.5). Below, the participant Laura’s drawings are presented (see also appendix C). The interviews that are presented in the thesis are translated into English.

3.4 Summing up

In this chapter, the design of the study has been described. Essentially, the attempt was to construct a balance between experimental and qualitative methods. Thus, the design of the study is naturally connected to the methodological approach outlined in Chapter Two.

The main part of the study was comprised of iterative circles of case studies, categorized as phases one, two, and three. In the first two phases of the case studies the approach was mainly explorative,
whereas the design of the case studies in the third phase was more experimental. Yet, the case studies within this last phase still included inductive approaches.

The last phase was the main object for the analysis presented in part five of the thesis. The first two phases provided the first steps towards the construction of hypotheses and enabled the exploration of didactical as well as research-related issues (see Boysen 2013a, 2014, and appendix J and N). Besides, the study included interviews with professional musicians, a DBR project and a field study (Boysen 2013b, 2015b). However, these studies occupy a more peripheral role compared to the case studies. Accordingly the overall design of the study may be pictured as below.
Part Two: Creativity
Chapter Four: The demarcation of creativity

4.1 Opening remark

I have done several presentations about creativity among researchers as well as school teachers and preschool teachers. Quite often I have tried to define creativity. This attempt always seems to lead to enthusiastic discussions. Definitions of creativity even sometimes seem to be provocative, especially among people that are working with children and pedagogy on a daily basis as part of their profession. Although I present different definitions as merely suggestions and possibilities, the response has frequently been an emphatic: ‘I just don’t agree with you!’ or ‘but I have my own understanding of creativity – and that is something completely different’.

I find such objections understandable. The definitions of creativity often seem to exclude activity normally conceived of as creative (see the following sections). Furthermore, the definitions often lead to counterintuitive notions of creativity as well as peculiar theoretical discussions that might seem rather distant from practical considerations regarding how to facilitate and enhance creativity. A part of the problem is probably due to the different perspectives involved. Theoretical attempts to define creativity are often focused on its boundaries, in the sense that the main task is to determine the line between what is and what is not creative, that is, the question of demarcation. On the contrary, practical considerations about creativity tend to be more focused on what is included in the category rather than excluded (see, for example, Robinson, 2001, pp. 1-18). Thus, it raises the question of accountability, in the sense that research in general involves a relation to specific communities. In other words, research is not isolated but rather accountable to specific authorities, fields, and networks (Haraway, 1988, pp. 583-584; Clarke, 2005, pp. 555-560). Consequently, if the applied definitions only make sense in a strictly academic sense, the connections to practical pedagogical contexts are weakened. This might not be a problem in the sense that an investigation of creativity doesn’t need to be related to pedagogical issues. However, in the present PhD, the ambition is to address academic concerns as well as practical issues related to learning and pedagogics. Furthermore, from a normative perspective, it is my belief that a definition of creativity should meet intuitive and general conceptions instead of departing from them (see also Klausen,
Thus, academic and more general notions of creativity should eventually be integrated.

In the light of the above, discussions of creativity with different people has often led to doubts on my part about the dominating framework of the field of creativity, let alone the very attempt to define creativity in the first place. I have quite often felt that something is wrong here. This is not a novel insight. The majority of academics engaged with creativity are struggling with the definition, and quite a few also emphasise that a proper understanding is yet to be found (Amabile, 1996, pp. 20, 37; Klausen, 2010, p. 359). On the one hand, this is frustrating, in the sense that the study of creativity is constantly challenged by questions of validity: Basically, without solid definitions, comprehensive investigations of creativity might well turn out to be investigations of something completely different. For instance, Guilford’s wide-ranging study of creativity in the middle of the twentieth century was subsequently criticised for not necessarily addressing creativity per se (Csikszentmihalyi, Fieldman & Gardner, 1994, p. 11; Weisberg, 1986, p. 68). On the other hand, the unresolved questions potentially promote explorative reflections that might lead to new understandings. Thus, an explorative investigation of creativity might benefit from the seeming ambiguities within the field.

4.2 The three predominant propositions

Three complimentary models and conceptualizations are dominating the field of creativity theory and can be found in various shapes and forms in the majority of current literature engaged in analytical discussions (Boden, 1991; Gardner, 1993; Sternberg, 1999) (see the models below). By applying these models it might be possible (1) to address different forms of creativity, (2) to include intuitive notions of creativity, (2) to avoid problematic attempts to make strictly objective assessment criteria, and (3) still be able to draw a line between what is creative and what is not. Thus, the three propositions in combination provide a theoretical framework by which questions of demarcation can be handled while still including common notions about creativity. However, it should be noted that the identification and categorization of ‘the three propositions’ is a result of my own attempt to systematize the literature review in this chapter. Accordingly, even though I will argue that most researchers apply the three propositions in one way or the other, they do not refer to them as ‘the three positions’.
**Proposition about the characteristic of creativity**

Creativity = novelty + value. This proposition forms a basic starting point, in the sense that most creativity studies, regardless of the type of field and forms of creativity that are explored, implement this specific presupposition. According to this model, creativity is defined by two criteria. On the one hand the outcome has to be novel, that is, original and unique. On the other hand the outcome has to be valuable, that is, useful, adaptive, appropriate, and functional (see for instance, Lubart & Sternberg, 1999, p. 3). However, the question is, who is to judge whether something is new and valuable and on what grounds? This issue is in general handled by applying the system model (proposition below).

**Proposition about the social construction: the system model**

Creativity is defined on the basis of three components; the individual person, the domain, and the field. Creativity is present when a group or an individual is producing something which is rooted in a specific knowledge-domain and is considered creative within a social field. In other words, the judgements are conducted by experts within a specific field based on rules and codes provided by the specific knowledge-domain. However, the main problem with this model is that behaviour normally referred to as ‘everyday-creativity’, such as children making drawings or regular problem-solving in general, are excluded from the category. Accordingly, this counterintuitive approach is supplied with a proposition about little-c creativity. Thus, ‘everyday creativity’ is included as a legitimate part of the main category, ‘creativity’.

**Proposition about little-c creativity**

Creativity is divided into two different categories; big-C creativity and little-c creativity. Big-C creativity refers to artefacts that are considered valuable and novel within the social field, i.e. the social organization of the domain (according to the propositions listed above). Little-c creativity refers to productions considered novel and valuable from the perspective of the creator. Thus, the former propositions are somehow still applied, although little-c creativity is determined on the basis of individual references and judgements instead of social fields and established domains.

In many ways, the three models offer a significant contribution to the field of research in terms of defining and assessing creativity. Still, applying these models results in various epistemological and
ontological problems and dilemmas. In the following discussion, the ambition is to seek out potential as well as dilemmas related to the three approaches.

4.3 **Novelty and appropriateness (proposition number one)**

As mentioned above, one of the most generally acknowledged propositions about creativity is that it embodies novelty as well as appropriateness. This proposition can be found in varied versions in the majority of the literature engaged with the understanding of creativity and is in general applied to all types of knowledge-domains (i.e., Stein, 1953, Gardner, 1993; Sternberg, 1999 Fredens, 2006; Kupferberg, 2006; Tanggaard, 2008; Johnson-Laird, 2002).

4.3.1 **The term ‘novel’ and the term ‘appropriate’**

The word ‘novel’ is sometimes substituted by words like ‘original’, ‘surprising’ or ‘unique’ (e.g., Simonton, 2010a). Still, it seems that the meaning is quite consistent in the sense that it basically refers to a product that represents something new (primarily made by human hands and human minds). Similarly, the word ‘appropriate’ may be replaced by terms like ‘useful’, ‘adaptive’, ‘fitting’ or ‘valuable’ (e.g., Tanggaard, 2008). In this case, the meaning might vary slightly between different domains and different conceptions, in the sense that something ‘useful’ in a situation of problem-solving might mean something rather different than, for instance, a feeling of aesthetic satisfaction. Accordingly, the word ‘valuable’ might be interpreted as a more general concept, in the sense that something ‘useful’ or ‘appropriate’ implicitly represents value, whereas something ‘valuable’ (like art) not necessarily is ‘useful’ in a typical understanding of the word. Furthermore, words like ‘appropriate’ and ‘useful’ might imply some kind of objectivity in the sense that it somehow suggests that the novel artefact has to ‘fit’ to something already extant, e.g. norms, rules, logical systems, semiotic systems, etc. In comparison, the word ‘valuable’ seems less connected to notions of objectivity. Thus, different usages of the discussed terms imply different approaches to creativity that have to do with different epistemological approaches.

4.3.2 **The proposition used for demarcation**

Often the proposition is explicitly supplied by examples that clearly indicate that the notion about novelty and appropriateness has a purpose of demarcation. In other words, the proposition is frequently applied to determine what is not creative, rather than what is creative. As an example,
Svend Brinkmann explains in a lecture held at The Danish Academy how pudding and ketchup might be a novel combination of ingredients, but hardly creative in the sense that it probably tastes bad, and accordingly has no value (Brinkmann, 2010). Thus, in this case, the novelty leads to something bizarre instead of something creative.

Although the proposition might be well-suited to demarcating creativity, it leads to quite a few problems. First of all, the suggestion about appropriateness is tricky. It seems highly counterintuitive that a process is not creative if it doesn’t result in a valuable outcome. In my presentations about creativity, the listeners often address this fundamental problem. Apparently, the definition simply doesn’t seem to correspond with general notions of creativity. The problem is related to – or produced by – the fact that creativity normally refers to a product as well as a process, yet still is defined primarily through the quality of the product (Klausen, 2010, p. 349).

Thus, according to Hallam and Ingold, this way of approaching creativity is to ‘read it backwards, in terms of its results, instead of forwards, in terms of the moments that gave rise to them’ (Hallam & Ingold, 2007, pp. 2-3). The challenge with a ‘forward reading’ of creativity is, however, that the concept becomes problematic to define. If a creative process is not connected to the outcome, but simply defined on the basis of the process, then how do we determine what is and what is not a creative process? The reasoning might lead to the tautology ‘a creative process is a process with the characteristic of a creative process’.

4.3.3 Can something be appropriate and novel at the same time?
Another basic problem regarding the proposition about novelty and appropriateness might be that the two terms seem highly contradictory. In other words, how can a product be novel and at the same time meet established criteria? This issue is discussed by Søren Harnow Klausen.

Creativity is both about breaking with norms and complying with norms. This doesn’t have to be a paradox, as long as one is talking about different sets of norms—breaking with the narrow or local ones while still meeting some general requirements. The standard definition hints at a balance point between conformity and divergence, but it has proven notoriously difficult to say something more illuminating about where this balance point might be.
(Klausen 2010, p. 355)
The tension between the novel and the appropriate is a well-known phenomenon also explicit within other domains. Thus, Elena Esposito describes in a lecture held at Lisbon Summer School for the Study of Culture the paradox within the field of fashion by stating that people in modernity ‘must be at the same time recognizable as fashionable and original as their own – the same and the different at the same time’ (Esposito, 2013). The problem includes theoretical as well as empirical dilemmas. On the one hand, the conceptual definition of creativity might lead to inconsistency, in the sense that two oppositionally-directed phenomena are embraced. On the other hand, the balance between novelty and appropriateness seems to be highly relevant for people engaged in creative processes on a practical level. This is demonstrated by the following case:

In an informal interview with Jan Eliasson conducted in 2002 (see Chapter Three), the distinction between the two concepts is explicitly emphasized. When discussing music, recording, and music production, he states that the artists quite often struggle with the balance between originality and general musical norms and preferences (what might be understood as appropriateness).

\(\textit{Everybody wants the music to sound nice and at the same time unique. They want the bass and the drums to sound right and at the same time special. It is like men and their girlfriends. On the one hand they want a girlfriend with big tits and on the other hand they want a girlfriend with unique appearance.} (Quotation based on notes, 2002)\)

Although the reference to men and their needs might seem a bit macho, I find the explanation intriguing. Specific female attributes might be appealing in a basic sense, but at the same time represent common stereotypes that are not necessarily compatible with uniqueness. Thus, the desire for the well-known might not be compatible with the desire for the un-known. The same applies to musical production. According to Eliasson, artists in general prefer that their music sounds ‘good’. However, many of the artists simultaneously want their music to sound original, that is, different. This is a very practical dilemma in the sense that the two strategies sometimes move in two opposite directions. On the one hand a widely used bass-sound sounds good. On the other hand, this specific bass-sound is well known, and therefore not novel. Thus, what Jan Eliasson is implying is that common aesthetic preferences exist, and when moving away from these norms, the music might sound original, but often not ‘good’. However, sometimes the music sounds good as well as original. How does this happen?
4.3.4 A balance between novelty and appropriateness

According to Klausen, the integration between novelty and appropriateness may be understood as a balance. This notion makes sense. The novel departs from the known but if it departs too much it becomes incomprehensible. Klausen develops this assumption by arguing that there seems to be ‘a tradeoff between novelty and usefulness’ in the sense that ‘a lesser degree of usefulness is compensated for by a larger degree of novelty, and vice versa’, indicating that creativity somehow can be understood as an equation (Klausen, 2010, p. 356)

A high degree of novelty is not considered especially creative if the gain in usefulness or appropriateness is relatively small. This can be illustrated by some well-known cases of musical creativity. Mozart is normally considered a more creative composer than Schönberg, although he invented no new musical genres or forms, whereas Schönberg broke completely with the whole tonal system and devised a new musical system all of his own. Mozart’s subtle exploitation of existing musical forms is held by most to have resulted in an aesthetically much more satisfying product than Schönberg’s revolutionary efforts. (Klausen, 2010, p. 356)

The connection pointed out by Klausen is quite interesting and also useful in the sense that many cases of creativity might be explained through this reasoning. However, the notion of balance is equally problematic. First of all it may be a connection primarily relevant in the arts, rather than, say, the sciences. Many examples can be cited of events that are simultaneously considered highly novel and highly satisfying within the field of science, e.g. Einstein and his theory of relativity, Copernicus and his model of the universe, Bohr and quantum theory, etc. Furthermore, the listed examples seem to reflect one of the fundamental ideas in Kuhn’s systems of science, in the sense that the development of a new paradigm is understood as the production of an entirely new perspective on the world that is considered highly appropriate, because it deals with unsolved questions in a much more satisfying way, compared to the challenged, previously accepted, paradigm (Kuhn, 1962). Secondly, many examples illustrate that the suggested balance might not be generally applicable, even within the field of arts. For instance, Björk is an artist often recognized for the novelty of her compositions as well as for her music’s wide-ranging popularity. The same applies to Stravinsky. Although Klausen equally mentions examples of products that are considered
highly original as well as useful, he primarily portrays these as extraordinary cases. However, I find the suggested balance less useful if it only applies to some samples. Finally, Klausen implies that the degree of novelty is an objective, measurable feature that can be graded within a continuum going from the plain imitation of norms to an absolute break with them. However, as much as this notion seems logical, it is highly problematic to define novelty objectively. I will return to this discussion latter.

4.3.5 Novelty and appropriateness are inseparable

In the light of the above, I consider the notion of balance interesting and in many cases inspiring and enlightening, but still a bit reductionist and simplistic. Instead, I prefer another much less daring suggesting made by Klausen,

\[
\text{My suggestion is that novelty and usefulness should be seen not as independent requirements, but as internally related: A creative product must be useful in a particularly novel way, and novel in a useful or appropriate way. (2010, p. 356)}
\]

Accordingly, Klausen proposes that the distinction between novelty and usefulness may be ultimately rejected in favour of a more interrelated concept. From this perspective it may not be valid to apply notions of novelty without also implementing notions of value. However, the analytical implications of such a strategy seem unclear, in the sense that no guidelines in terms of how to comprehend this interconnection are provided. Furthermore, it seems like Klausen is somehow suggesting a distinction between novelty and appropriateness, and at the same time suggesting the deconstruction of such a distinction. More precisely, on the one hand he introduces the described balance between novelty and usefulness, implying that levels of novelty might be measured, and on the other hand he claims that the two phenomena can not be separated. Thus, the twofold understanding of creativity is upheld and rejected simultaneously, which may imply that the distinction between novelty and usefulness works after all, at least on a theoretical level. Or maybe we just haven’t figured out a more appropriate way of addressing the phenomenon of creativity. Still, Klausen’s reflections on the two categories as being basically inseparable represent an important point with respect to the understanding and identification of creativity.
4.3.6 Summing up: how to implement the proposition in the study?

On the one hand, the proposition about novelty and appropriateness is a question of strict demarcation that might be used deductively. On the other hand the proposition might also represent a more explorative, inductive attempt to understand creativity. However, the two purposes are connected in the sense that it may be difficult to investigate something without knowing how to locate it. In the light of the above, it is quite clear that the proposition about novelty and appropriateness contains several problems. Still, given the many theoretical, philosophical, and practical implications and dilemmas, it is equally reasonable to suggest that something is really at stake here. It doesn’t mean that the proposition is somehow correct or inevitable. What it means is that this proposition is relevant to discuss and implement in this study in order to explore as well as to demarcate creativity.

In the case studies, the proposition about novelty and appropriateness was integrated in several ways: In the interviews I invited the participants to reflect upon these concepts. Furthermore, the questionnaire given to the evaluation groups included a rating scale with respect to this proposition (see Chapter Three). However, as discussed in the above, different words might represent different perspectives. In the questionnaire, the words ‘originality’ and ‘quality/craftsmanship’ were used. This choice was caused by the ongoing dialog with participants in the second phase of the case studies. From the perspective of the participants, ‘originality’ is in general the most obvious word to use about music considered ‘novel’. Equally, ‘quality’ and ‘craftsmanship’ seem to be the most suitable word for music that is considered useful, appropriate, and valuable in the sense that it sounds good and appears to be well-made.

4.4 Csikszentmihalyi and the system model (proposition number two)

For creativity to occur, a set of rules and practices must be transmitted from the domain to the individual. The individual must then produce a novel variation in the content of the domain. The variation then must be selected by the field for inclusion in the domain. (Csikszentmihalyi, 1999, p. 315)
In 1988, the creativity psychologist Mihaly Csikszentmihalyi introduced a model that today has gained widespread recognition (Csikszentmihalyi, 1988). This model is applied by researchers in varied forms throughout the field of creativity (i.e., Gardner, 1993; Fredens, 2006; Kupferberg, 2006; Sternberg, 1999). According to the model, creativity is defined on the basis of three categories; the individual, the domain, and the field. Creativity is present when all three factors are integrated; (1) an individual (or a group of individuals) producing something, (2) a knowledge-domain that represents the starting point for the production, and (3) a social field which decides whether or not the production can be regarded as ‘creative’. Thus, it is not possible to be creative independently from a specific knowledge-domain. Equally, it is not possible to define something as creative unless this very property is confirmed in a social field.

4.4.1 Constructivism and objectivism

The model has constructivist as well as objectivist implications. On one hand, the model is obviously inspired by traditional sociological approaches, such as Bourdieu's field theory. In that respect, ‘creativity’ is a social construction and there is no way of appointing something as ‘creative’ if it is not confirmed in a social field. This is circular reasoning; what is creative is what people think is creative. On the other hand, the model implies that a knowledge-domain consists of a definitive set of rules and codes. From this perspective, it might be possible to objectively examine whether or not an artefact is based on these rules and/or to which extent the rules are broken.

*Creativity is any act, idea, or product that changes an existing domain, or that transforms an existing domain into a new one.* (Csikszentmihalyi, 1996, p. 28)

This balancing between social constructivism and more objective/positivistic approaches represents a key dilemma in creativity theory and can be identified in the work of some of the main researchers within the field, e.g. Margaret Boden (1991), Anna Craft (2005), Teresa Amabile (1996), and Hans-Henrik Knoop (2002). The question of whether or not this strategy is reasonable from an epistemological point of view will be addressed from different perspectives throughout the following discussions.
4.4.2 The structure of the domains and fields

According to Csikszentmihalyi, different domains are structured in different ways. Some domains are characterized by definite norms, codes, and rules, whereas other domains are more blurred and less clearly organized when it comes to the inherent and inherited volume of knowledge. Csikszentmihalyi suggests that the structure of the domain might be related to the type of knowledge forming the domain. Thus, domains like mathematics or physics are defined as ‘highly structured’, whereas domains like philosophy, social science, and psychology are described as less structured (Csikszentmihalyi, 1996, pp. 39-49).

The symbolic system of mathematics is organized relatively tightly; the internal logic is strict; the system maximizes clarity and lack of redundancy.

(Csikszentmihalyi, 1996, p. 39)

According to Csikszentmihalyi a structured domain is somehow more measurable. Thus, it seems like Csikszentmihalyi basically refers to positivistic conceptions of knowledge as opposed to more constructivist ones. Simonton apparently suggests a similar understanding of knowledge domains, when he writes:

Disciplines differ substantially regarding the field’s consensus regarding the composition of the domain. In fact, empirical research indicates that major disciplines can be placed in the following order: physics, chemistry, biology, psychology, sociology, the humanities, and the arts. Expressed in Kuhnian terms, the natural sciences are more paradigmatic than the social sciences, which in their turn are more paradigmatic than the humanities and the arts.

(Simonton, 2010a, pp. 166-167)

As it is the case with the domains, the fields are also described as basically different in terms of stability and structure (Csikszentmihalyi, Feldman & Gardner, 1994). Some fields are characterized by a solid network of institutions, competitions, teachers, educations, and public reviewing, whereas other fields are less centred and less well organized (Csikszentmihalyi, Feldman & Gardner, 1994, p. 36) (for further discussions on the interrelation between field and domain, see Appendix L and R).
4.4.3 Csikszentmihalyi’s system model presupposes stability

All though Csikszentmihalyi describes different levels of clarity it still seems like well-organized fields and domains are somehow presupposed. First of all, rules and norms are repeatedly described as something relatively stable, demarcated, and well defined. This approach is for instance reflected in the notion about the ten years of training required in order to make a creative contribution to a domain (see Chapter One). In other words, Csikszentmihalyi somewhat assumes that a domain is characterized by rules that will endure for many years. At least, the question of whether the domain might develop during the ten years of training or the impact such developments might have on the process of learning, is not addressed. Secondly, according to Csikszentmihalyi, the domain is mainly dominated by experts in formal positions and with formal educational backgrounds. The audience, (the users, the students etc.) is not really addressed as a major player in terms of the development of the domain.

*It is the task of the ‘field’ to select promising variations and to incorporate them into the domain. The easiest way to define a field is to say that it includes all those persons who can affect the structure of a domain. Thus, the field of art includes the following; art teachers and art historians, because they pass on the specialized symbolic information to the next generation; art critics, who help establish the reputation of individual artists; collectors, who make it possible for artists and works of art to survive; gallery owners and museum curators, who preserve and act as midwives to the production of art; and, finally, the peer group of artists whose interaction defines styles and revolutions of taste. (Csikszentmihalyi, 1988, p. 330)*

There might be several reasons for this approach to the field and the domain. First of all, Csikszentmihalyi’s descriptions are probably quite accurate in many cases in the sense that experts often occupy dominating positions in the field. Secondly, Csikszentmihalyi’s investigations of creativity are in general devoted to unambiguously big-C creativity with a clear focus on well-established fields and domains, like physics, classical music, etc. Thus, the main body of the empirical material included in Csikszentmihalyi’s large-scale study of creativity conducted between 1990 and 1995 consists of investigations and interviews with people that are at least sixty years old and have made differences within ‘a major domain of culture’, including fourteen Nobel Prize winners (1996, p. 12). Thus, the focus is not just ‘domains’ but rather ‘major domains’, which
apparently are understood as well-established domains with a long-term history and a partly formalized social field, e.g. represented by venerable institutions as the Nobel Prize. Furthermore, the investigation is highly retrospective, leaving out contemporary cases and, accordingly, leaving out the possibility that domains and fields might appear differently from a modern perspective.

In the light of the above, it seems like Csikszentmihalyi is simultaneously launching and exploring the system model of creativity. That is, a specific type of system is suggested as a general model of creativity and, simultaneously, research is primarily conducted within the domains and fields that meet the specified standards. Csikszentmihalyi’s descriptions of domain and field are probably very suitable in many cases but not necessarily suitable in every case. Undoubtedly, the line of reasoning inherent in the descriptions of field and domain might be challenged in a number of ways. Firstly, the quality of the field may not be constituted through formal gatekeepers and expert judgements. That is, social and global digital-based networks like e.g. YouTube may be seen as an alternative way to organize the field, providing a more user-driven and less expert-based system of judgement (Keen, 2007). Secondly, rapidly changing domains may not contain an unambiguous solid and stable amount of rules and codes (Csikszentmihalyi, 1996, p. 29).

4.4.4 Summing up: how to implement the proposition in the study?

The system model offers a valuable insight into the social construction of creativity. Nevertheless, the model might be most suitable to explain how creativity is constituted within stable domains. In this study, the model is challenged in two ways. First of all the evaluation groups do not consist of people in formal positions within the field of music. Conversely, they represent listeners of music in general. Second of all, the chosen domain is computer-based music in a youth cultural context. Thus, the chosen domain might represent a type of domain essentially different from the domains investigated by Csikszentmihalyi in terms of stability and coherency. Most importantly, the rules, codes, and techniques that constitute the domain might be more disputed (see Chapter One).
4.5 Large scale and small scale creativity (proposition number three)

One of the most prominent problems with Csikszentmihalyi’s model is that it addresses only artefacts accepted by the experts within established domains and fields. Everyday creativity such as the child painting a picture in kindergarten is normally excluded from the field of study. Such events can simply not be explained as creative according to the system model. Now, it is of course an analytically legitimate strategy primarily to associate creativity with the well-known masters and their achievements. Thus, a few theorists actually stay loyal to this framework and conclude that, for instance, children in general are not creative (e.g., Fredens, 2006). However, this is also a rather counterintuitive and limiting statement, which makes it quite impossible to address many of the events people in general refer to as creative.

4.5.1 Definitions of little-c creativity

An alternative strategy is to create a distinction between creativity constituted in the domain among the appropriate experts and creativity found in everyday life, often referred to as the distinction between big-C creativity and little-c creativity. The concepts are quite often applied in analytical frameworks dealing with creativity. However, the meaning varies. Firstly, little-c creativity is sometimes associated with a specific type of behaviour, like for instance divergent thinking (e.g., Craft, 2005, p. 19). This approach seems reasonable, but inevitably results in problems of demarcation as discussed above. Secondly, little-c creativity is sometimes associated with ‘everyday events’ as opposed to ‘extraordinary achievements’ (e.g., Craft 2005, p. 30; Beghetto & Kaufman, 2009, p. 1). However, the objective criteria for stating that something is remarkable and something is not, seems blurred. Third, little-c creativit is sometimes understood as processes that are basically equal to those associated with big-C creativity, but with the very important difference that they don’t lead to the transformation of wider culture (Knoop, 2002, p. 122). Still, the specifics of these creative processes seem unclear. Fourthly, little-c creativity is sometimes understood as an individual act that may be understood as extraordinary in comparison to other acts done by fellow peers (Amabile, 1996, p. 37). However, the question of who is able to judge this specific quality is left open (Amabile, 1996, p. 37). Fifth, little-c creativity may be seen as a strictly individual experience. In other words, if the individual feels that they have done something novel and valuable, then it may be understood as little-c creativity (Craft, 2005, p. 31). This basically
constructivist approach seems appealing because the question of demarcation becomes relatively simple. Nonetheless, this definition easily leads to tautological arguments.

In the light of the above, the notion of little-c creativity is ambiguous. Furthermore, quite often, several different approaches are incorporated in the same analysis, leaving the question of demarcation unanswered. For instance, in some interpretations it remains unclear whether or not the difference between big-C creativity and little-c creativity is based on objective criteria or depends strictly on social constructions and individual perceptions (i.e., Amabile, 1996; Craft, 2005). This might not be a problem in the sense that the proper way to understand little-c creativity might be a mix between different approaches. However, fundamental problems are still unavoidable and must be addressed. In short; if little-c creativity is a number of procedural components, how do we determine which components are most important; if little-c is a social and/or individual construction, how do we avoid a strict tautology and complete relativism; if little-c is an objective phenomenon, how do we determine the objective criteria?

4.5.2 Margeret Boden: an objective approach

According to the above, it seems like objective notions are often mixed with a constructivist framework. In contrast, Margeret Boden is one of the few researchers that explicitly tries to pursue and elaborate a more positivistic approach to creativity. This is partly related to her ambition to create computer programs able to simulate creativity (Boden, 2010, p. 29). Boden suggests a slightly different variation of the described distinction between big-C and little-c. According to Boden, the constitution of big-C creativity is not of great importance. The important thing is to investigate the psychological processes resulting in artefacts new to the individual creator: ‘Suppose a twelve-year old girl, who’d never read Macbeth, compared the healing power of sleep with someone knitting up a ravelled sleeve. Would you refuse to say she was creative just because the Bard said it first?’ (Boden, 1991, p. 2). Instead of adopting the concepts of big-C creativity and little-c creativity directly, Margaret Boden suggests a distinction between Historical Creativity (H-creativity) and Psychological Creativity (P-creativity). Historical creativity is defined as historically ground-breaking events, i.e. the invention of the wheel or the emergence of rap music. In that respect, H-creativity is similar to big-C creativity as defined by Knoop (2002, p. 122). P-creativity is, on the other hand, referring to everyday events from an individual perspective, with a clear focus on psychological/cognitive processes.
P-creativity involves coming up with a surprising, valuable idea that’s new to the person who comes up with it. It doesn’t matter how many people have had that idea before. But if a new idea is H-creative, that means that (so far as we know) no-one else has had it before: it has arisen for the first time in human history (Boden, 2004, p. 2).

Although an individual perspective is applied, P-creativity is not a strictly subjective matter. Quite the opposite: it is, according to Boden, possible to define P-creativity by the means of objective characteristics. Boden explains this by introducing the term conceptual space, which she defines as ‘an accepted style of thinking in a particular domain’ (Boden, 1999, p. 352). Creativity is achieved when the conceptual space is explored or transformed. Seemingly, the ‘conceptual space’ is a term similar to ‘domain’ suggested by Csikszentmihalyi. But whereas Csikszentmihalyi emphasizes how constructions of creativity are located in the social field, Boden insists on an individual perspective. In that respect, the individual person can be creative in the sense that he/she can combine new things, explore or even transform the conceptual space itself. It doesn't matter whether or not these combinations are old news or these explorations or transformations have been seen before, as long as these events represent something new (and valuable) on an individual level. Accordingly, by strictly focusing on the relation between actor and action, she attempts to show how P-creativity can be measured strictly by objective attributes.

In many ways, Boden’s suggestion makes sense. However, Boden is still caught in the battle between a constructivist and positivistic approaches. On the one hand, she frequently acknowledges that creativity is something that is related to social constructions (Boden, 1994, p. 77). On the other hand she emphasizes that not only novelty but also value might be measured; ‘it is difficult to specify aesthetic values…it is however, possible’ (Boden, 1999, p. 351). Nevertheless, she is simultaneously stating that ‘value is not found by science, but negotiated in social groups’ (Boden, 1999, p. 351).

4.5.3 Summing up: how to implement the proposition in the study?
Little-c creativity represents a valuable and necessary supplement to big-C creativity. However, the definition of the concept seems unclear. In the present study, I do not attempt to solve the puzzle in any unambiguous way. Rather, I recognize that the concept contains different aspects. Nonetheless, in my opinion, two approaches to little-c creativity seem most productive and workable, in spite of
the objections outlined in the above. First, little-c creativity must refer to processes and products that seem novel and valuable from the perspective of the creator. Second, little-c creativity might be associated with processes typically understood as creative (see Chapter Five). In the present study, little-c creativity offers an important tool in order to track creativity. Most importantly, I ask the participants in the case studies to point out the best musical elements in their composition and describe the processes leading to these elements. Accordingly, I attempt to explore creativity from the perspective of the individual creator.

4.6 **Value is a social construction but novelty is not?**

In the light of the above, it seems reasonable to propose that questions of objectivity are somehow inherent in the three propositions, but still obviously not resolved in a definitive way. Thus, I will now continue my discussion of the three propositions by taking a closer look at the implied elements of objectivity. First of all, I will address the general notion that value represents a clear social construction, whereas it might be more possible to judge novelty objectively.

Following the logic suggested by Csikszentmihalyi, the transformation of a given domain includes objectively recognizable changes. In other words, the level of novelty may be neutrally determined by comparing the new artefact with the existing domain. On the contrary, the value of a new artefact is not objectively identifiable but must be determined by gatekeepers within the social field. It is not clear whether Csikszentmihalyi fully adopts such a definite distinction between quality and novelty. Nevertheless, the distinction pervades his approach to the field, such as his suggestion that the level of novelty within certain domains can be ‘measured’ (Csikszentmihalyi 1996, p. 29) or when he distinguishes between valuable and useless novelty.

> [The field] decides whether an individual performance that departs from the standard rules of the domain is ‘creative’ and thus should be added to the domain, or whether it is simply ‘deviant’ and thus should be ignored or censored. (Chikszentmihalyi, 1994, p. 146)

Accordingly, the designated notion of creativity is based upon a twofold approach to the concept in question, which may be simplistic illustrated as in the following table.
Table 4.1 The twofold understanding and identification of creativity

<table>
<thead>
<tr>
<th></th>
<th>Novelty</th>
<th>Value</th>
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<tbody>
<tr>
<td>Based upon…</td>
<td>Objective criteria</td>
<td>Social constructions</td>
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Many studies of creativity explicitly or implicitly implement the outlined distinction (Weisberg, 1993; Amabile, 1996; Boden, 2010). For instance, Smith argues that the concept of creativity from a scientific point of view must be based primarily on questions of novelty, in the sense that ‘novelty’ is somehow possible to measure, whereas value is not (2005, p. 294). Equally Simonton (1980) examines a large number of melodies in order to measure questions of novelty, leaving out analytical attempts to measure levels of value. In many ways the sketched approach seems reasonable, workable, and maybe even intriguing in the sense that it becomes possible to identify visible traits of creativity. On the other hand, it is not easy to separate questions of novelty from questions of value (see discussions above). And even if this distinction is accepted, it may still be rather difficult to identify novelty.

The attempt to objectify novelty might be connected to the characteristics of the domain. Thus, although Csikszentmihalyi implies that novelty can be understood on the basis of objective identifiable domain-specific norms, he still stresses that the identification may be problematic in some cases. Thus, he establishes a hierarchy, suggesting that some domains are more easily measured than others. Accordingly, we are back to the discussion about different types of domains.

> [...] novelty is more obvious in domains that are often relatively trivial but easy to measure; whereas in domains that are more essential novelty is very difficult to determine. There can be agreement on whether a new computer game, rock song, or economic formula is actually novel, and therefore creative, less easy to agree on the novelty of an act of compassion or an insight into human nature. (Csikszentmihalyi, 1996, p. 29)

It seems plausible that some domains are more established and homogeneous than others and therefore enable relatively unproblematic comparisons between new artefacts and the given norms. However, it equally seems questionable that the identification of novelty may rely on strictly objective criteria. As an example, you may consider contradictory book-reviews. What is designated as innovative in one review may be described as old news in another. In that sense, it
depends on the perspective and how the text is interpreted. Another example would be the performance of music. If an individual plays a song at the piano they will probably play it in a new way every time, measured in strictly objective musical patterns like tempo, dynamics, etc. But neither the pianist nor the audience would probably consider it unique. Sometimes though, the music is performed in a way that is considered ‘novel’: for example, when the symphonic masterpieces are reinterpreted by famous conductors such as Fabio Luisi or Vladimir Ashkenazy. In that case, objective criteria can be used to make an argument. But the line of reasoning can hardly go the other way around.

4.7 Antirealism and Realism

From a philosophical point of view, the questions of objectivity may be understood as a struggle between realism and antirealism. In the article ‘the Notion of Creativity Revisited’ Søren Harnow Klausen addresses the concept of creativity on the basis of a distinction between these two scientific starting points (2010). From an antirealist perspective creativity is nothing but a social construction. From a realist perspective, creativity exists independently of the social construction. The fundamental questions addressed are twofold. First, if creativity is nothing but a social construction, how, then, can we say anything ontological about the phenomenon of creativity? And how do we deal with the obviously counterintuitive notion that a process only can be understood as creative if it leads to a product that is judged creative? Second, if creativity is something that exists independently of the social construction, how do we explain historical cases of people that are considered creative in one century but not in another (see the case of Mahler; Appendix R and Boysen, 2010b).

In order to construct a compromise between a realist and an anti-realist approach, Klausen adopts the term ‘response-dependent’ (Johnston, 1989). The basic idea is that some features contain some ontological characteristics and at the same time depend upon a certain type of response. Klausen explain the concept by referring to the construction of colours:

Colours have their dispositional properties partly in virtue of the surface structures of the objects they are colours of, partly in virtue of the human sensory system. This allows for a suitable compromise between realism and antirealism, objectivity and subjectivity: Colours are linked to subjective
responses, but these are not merely subjective whims, they are genuine responses that have to answer to a certain determinate part of reality’


Klausen is suggesting that creativity must be understood as a partly independent feature of reality. However, in order to ‘see’ creativity you have to possess the proper eyes. In other words, creativity exists independently but is only acknowledged by the proper audience. The advantages of this type of reasoning are comprehensive, in the sense that it enables ontological descriptions and definitions of the phenomenon. However, it might be problematic to decide which audience is able to judge in the most appropriate way. Therefore, the question of what is creative and what is not is somehow left unresolved.

From my point of view Klausen is too radical when it comes to realist assumptions about creativity, for instance when he suggests, ‘that someone might succeed in faking creativity’ or when he claims that the audience might wrongly identify something as creative (Klausen, 2010, p. 353). Therefore, the path chosen in this thesis relies more on constructivism than objectivism. However, I find his descriptions of the dilemmas within the field of creativity very exact. Furthermore, I agree with Klausen that a bulletproof definition of creativity hardly exists and that the researcher consequently must consider and incorporate different approaches (Klausen, 2010, p. 355).

4.8 Summing up

In the present chapter it is suggested that a definition of creative products ultimately must be based on the three discussed propositions. Yet these propositions entail a number of problems. Most importantly, there seems to be a conflict between objective and constructivist assumptions. Next, the separation of novelty and value might be problematic. Finally, the definition of little-c creativity seems unclear.

In the chapter I made a number of decisions with respect to the outlined dilemmas. Most importantly, I argued that creativity ultimately must be understood as a construction rather than an object characterized by specific features. Yet the constructivist approach does not exclude the possibility of exploring the phenomena people consider creative in their appearance as objects. Next, I argued that the distinction between novelty and value represents an analytical distinction
that is widespread within academia as well as within art. Nonetheless, the features are essentially mixed. Further, I argued that there exist different forms of fields and domains with different attributes in terms of stability and coherence.

The discussions of the three propositions have lead to a number of operationalizations regarding the design of the case studies. These operationalizations are summarized in the table below alongside the key questions and decisions.

<table>
<thead>
<tr>
<th>Table 4.2 Implication and operationalization of the three propositions</th>
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<tr>
<td><strong>Proposition</strong></td>
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<tr>
<td>Value and novelty</td>
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<tr>
<td>Social construction</td>
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<td>Little-c creativity</td>
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Chapter Five: Creative processes

5.1 Introduction

In the present chapter I will focus explicitly on creative processes. However, as argued in the previous chapter, it is hardly appropriate to suggest that there exist some kinds of processes that by definition result in products considered creative. Yet it seems reasonable to explore which types of processes are related to creative outcomes in general. Thus, the following chapter will include a number of definitions and descriptions of creative processes. However, processes and products are connected in various ways (see also Chapter Four, section 4.3.2). Consequently, the following discussions also refer to creative products even though processes are the main focus.

In the field of creativity, one can find a number of characteristics frequently associated with creative processes. First of all, creativity is often understood as a certain type of divergent thinking that contains characteristics of fluency, flexibility, originality, and elaboration (Guilford, 1950; Torrance, 1974). These concepts refer respectively to the quantity of responses, the number of different categories of responses, the uniqueness of responses, and the detail level of the responses (Hickey, 2003, p. 33). Thus, creative processes are often associated with the production of many different types of exceptional ideas. Second of all, explorative work is normally mentioned as a crucial part of creative activity (Wallas, 1926; Torrance, 1974; Webster, 1987; Amabile, 1996; Runco & Charles, 1997; Hickey, 2003; Seddon & O’Neill, 2003). Accordingly a creative process may typically include some kind of experimentation. Next, skills and knowledge are often considered to be vital parts of a creative process (Amabile, 1996, pp. 69-71). Finally, the creative process is often divided into different phases including practises, such as preparation, incubation, illumination, and verification (Wallas, 1926). Even though the contents of such stages are disputed (Weisberg, 1986, p. 24-31), it seems to be the general view that stage-models of creativity must include at least some kind of exploration, generation of responses, and verification/evaluation (Amabile, 1996, p. 78; Hickey, 2003, p. 39).
Needless to say, creativity theory is not limited to the outlined suggestions. However, it is not the aim to present a comprehensive review of creativity theory. Rather, this chapter is based upon, and written in a dialog with, the produced empirical material. In other words, I include a number of theoretical perspectives because I specifically seek to address the questions that I encounter through my ongoing analysis. Consequently, this chapter primarily deals with the balance between exploring and planning. In other words, I try to discuss the implications of ‘sightedness’ and ‘blindness’ (Simonton, 2010a, p. 159) with regard to creative processes and with regard to the influence of expertise.

The chapter falls into three parts. Firstly, I discuss the implications of heuristic and algorithmic processes. Secondly, I discuss intentionality as opposed to mistakes and coincidence. Finally, I discuss systematic views on creativity as opposed to chaotic views on creativity.

**5.2 Heuristic and algorithmic processes**

During my analytical work in the present PhD I quite early on applied different categories to the work of my participants that might be associated with heuristic and algorithmic processes. Thus, it seemed obvious to apply this distinction in the ongoing analysis. Amabile is one of the researchers within the field of creativity that highlight the importance of heuristic processes. Therefore, Teresa Amabile’s description of creative processes is included in the following discussions.

**5.2.1 Creativity according to Amabile**

According to Amabile, heuristic procedures represent a key element in a creative process. On the contrary, algorithmic procedures are interpreted as non-creative:

> A product or response will be judged as creative to the extent that (a) it is both a novel and appropriate, useful, correct or valuable response to the task at hand, and (b) the task is heuristic rather than algorithmic’. (Amabile, 1996, p. 33)

Drawing on Hilgard and Bower (1975), she defines the two terms as follows:

> Algorithmic tasks are those for which the path to the solution is clear and straightforward – task for which an algorithmic exist. By contrast, heuristic
According to Amabile, an algorithmic task might be, for instance, solving an addition problem, whereas a strictly heuristic problem might be ‘finding a cure for leukemia’ (Amabile 1996, p. 33). However, as I read Amable, many tasks and procedures might be characterized by heuristic as well as algorithmic elements in the sense that, say, creating a new version of Pound Cake will rely on traditional recipes as well as experiments without pre-existing well-defined procedures.

Furthermore, Amabile points out that the process relies primarily on the individual rather than on the task itself. That is, if a student independently proves a well-known theorem in geometry she would ‘certainly be said to have solved a heuristic task’ (Amabile, 1996, p. 34). Accordingly, Amabile’s approach to creativity seems to be related to Boden’s focus on the relation between creator and creation (see Chapter Four). In other words, what defines a heuristic process is whether or not the individual finds a method that is unknown to himself or unknown to everyone.

5.2.2 The case of Anders: to work with or without a plan

As a result of the first iterative circles of analysis, I found that the experienced participants were working with specific strategies, whereas the novices were working without such methods. Thus it seemed like the experienced relied more explicitly on algorithmic procedures. The following observation might illustrate this difference between the novices and the experienced. In this observation, Anders, Britt, Pia-Marie, and Maibritt worked with a musical composition using the computer. Anders was a skilled musician and had played music for many years. Britt, Pia-Marie and Maibritt had no prior musical training.

Anders is in control. He takes most of the group’s decisions and he has placed himself in the middle surrounded by the girls and in front of the computer with his hand on the computer mouse. At the movement he is cutting up and repeating a sample in order to make it fit the music produced so far. Maibritt suggests another sample but Anders replies, ‘this sample has to be there. Otherwise the rhythm won’t fit.’ Anders keeps on working on the sample for the next five minutes. He plays the result. Britt is quite happy about the outcome, ‘I believe that was it’, she states. Anders is shaking his head, clearly unsatisfied. ‘It is as good as it gets’, Britt insists. Anders is drumming on the table trying to
find a steady beat. ‘The problem is, that if the sample doesn’t fit and the drums subsequently is put in, the music will sound completely…’. Anders is explaining the potential problem with rhythm, while he moves his hand abruptly through the air in order to illustrate the unsteady pulse. Maibritt joins the discussion: ‘Couldn’t you try to play the sample together with some of the other stuff?’ Anders doesn’t answer or respond in any way to Maibritt’s suggestion. Anders keeps on working on the sample in order to make it fit the rhythm. Suddenly Anders exclaims, ‘Now it fits…Now the rhythm works’.

In this excerpt, Anders is apparently working according to a specific procedure or line of order. That is, the musical layer has to correspond a specific beat that has to be defined rather early in the process in order to make the subsequent musical layers fit a specific pulse. Hence, Anders began the work on the composition by establishing the basic drums. According to Anders, an alternative procedure might result in potential problems. Conversely, the novices, also part of the group, wanted to try out different things. They seemingly had no specific a priori plan or end goal. They preferred to experiment with different combinations of sounds.

In another observation of the group, the different approaches to music-making resulted in distinctive types of attention and flexibility. In this sequence, Anders was working on a number of specific samples. In the process, a mistake suddenly happened. The novices in the group were quite pleased with the result of the accident. However, Anders didn’t seem to notice it. He was trying to correct the mistake.

Anders is selecting and pasting a sample. He plays the result. Immediately he stops the music. ‘This was rather awful, ei!’ Anders begins removing the sample. However, Pia-Marie protests, ‘I think it was great’. Maibritt second: ‘I think it fitted in quite well’. Anders plays the result ones more. Britt agrees with Pia-Marie and Maibritt. ‘It sounds actually great’. Anders finally agrees. ‘It actually sounds good, but it will be difficult to loop’.

Following Amabile’s definition, novices will quite often need to work heuristically, because they are unfamiliar with the procedures and algorithms characterizing the domain. Therefore, they
simply have to work heuristically if they are not presented with a specific model, manual, or recipe. Naturally, the existence of heuristic processes doesn’t exclusively indicate creativity (see Amabile’s definition above). Nevertheless, the described observations indicate that sometimes following a clear algorithm might result in an entrenched perspective, excluding the possibility of going in new and unexpected directions. In the example above, Anders does not seem to value the unexpected musical detail in the first place. However, the novices instantly notice the unexpected detail. This indicates that novices might sometimes pick up ideas and opportunities not observed by the experts.

5.2.3 Heuristic processes and bisociation

The discussion of the case of Anders might benefit from a reference to Koestler’s notion of bisociation. According to Koestler, creativity might be described as a novel combination of existing ideas and materials. In order to stress that creativity is not only the act of adopting already known associations but rather the creation of new associations, Koestler suggests the word bisociation. Accordingly, creativity may be described as the occurrence of a new connection between different matrices (Koestler, 1964). This type of approach to creativity can be found in various versions in the majority of the field of creativity theory (Poincaré 2013; Hadamard, 1954; Florida, 2002; Weisberg, 2006, pp. 399-400, Simonton, 2010a).

The notion of creativity understood as novel combinations of existing ideas may be supported by historical cases (e.g., Florida 2002), self-biographical reflections (e.g., Poincaré 1913), and laboratory experiments (e.g., Duncker, 1945). Furthermore the notion is partly supported by a logical rationale: if creativity is something novel, it must be a novel mix of something known, in the sense that it is impossible to build a new idea out of nothing (e.g., Watson, 1958). Nonetheless, the problem with the general notion of bisociation is twofold. Firstly, it is a post-hoc definition. In other words, a novel combination is not creative per se, because this combination is not necessarily considered valuable (see Chapter Four). Secondly, it is a hypothesis that can hardly be examined or tested systematically.4 In other words, every artefact considered ‘creative’ could probably be described post-hoc as a bisociation, depending on the interpretation. From a qualitative point of view this is not a problem, in the sense that the notion of bisociation might be a very productive

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4 According to basic traditions within the field of positivist science (e.g., Popper, 1934) a hypotheses has to be falsifiable (see for instance Csikszentmihalyi, 1996, pp. 14-15).
theoretical framework to apply inductively. However, it seems problematic to suggest that bisociation represents a general law or rule in a positivistic sense of the word.

Nonetheless, according to Koestler, habits and routines might eventually inhibit unexpected combinations between different phenomena. In other words, people become accustomed to make specific associations. In order to promote creativity, such routines must be broken.

*Habits [...] reduce man to the status of a conditioned automaton. The creative act, by connecting previously unrelated dimensions of experience, enables him to attain a higher level of mental evolution. It is an act of liberation – the defeat of habit by originality.* (Koestler, 1964, p. 96)

In the case of Anders, an unexpected combination of sound suddenly appears by mistake. This unexpected combination might be interpreted as a kind of bisociation that the expert is seemingly not able to discover. In the different case studies I often observed this mechanism. At one point I wrote down this reflection in my memos in metaphorical terms:

*Imagine the experienced participants in a forest. They walk on a specific path, towards a specific destination. If something falls down from a tree, they just keep on walking. The novices walk in a similar wood. However, they don't follow a specific path. They are walking around randomly. If something falls down from a tree, they pick it up, investigate it. And they are thinking something like, 'maybe I can use this for something'* (Memo, September 2012)

This analogy might seem a bit romantic in regard to the abilities of the novices. Quite often my empirical material also indicates that novices try to reach a specific musical solution but somehow find that they are unable to fulfil such vision. Further, the novices often pick up musical ideas that are considered rather basic from an expert perspective. Additionally, competent musicians are naturally also able to experiment and follow heuristic procedures and pick up unexpected gold. Finally, heuristic, exploring, and coincidental procedures might be challenged by the notion of intentionality. In other words, does the process still count as creative if the novices pick up musical ideas by coincidence and without intention?
5.3 Intentionality

According to a large proportion of scholars, intentionality is a crucial precondition for creativity. In other words, if no intentionality is present, creativity is not present either. However, as I will argue in the following sections, this suggestion is problematic.

5.3.1 Intentionality as a precondition for creativity

Robert Weisberg is one of the researchers within the field of creativity that emphasizes the importance of intention. In the book, Creativity: Understanding Innovation in Probling Solving, Science, Invention, and the Arts, Weisberg underlines and reinforces this statement through a hypothetical case:

*Let us say that I am a painter, and one day I accidentally spill paint on a canvas, which leaves a stain on my partially finished work, making it unusable. Let us further assume that I am visited by the director of a museum, who sees my stained canvas, loves it, and purchases it for display in the museum. The painting is then discussed in art books, and other artists use my spilled work as the basis for innovation of their own. [...] Was I creative in producing that painting? No; since the novel element, the stain produced by the spilled paint, was an accident, then I get no credit. I am creative only when the novel idea is produced intentionally.* (Weisberg, 2006, p. 60)

The point made by Weisberg is repeated in various forms in many discussions of creativity (e.g., Boden, 2010, pp. 29-40). Furthermore, it is a basic assumption within the field of aesthetics that the creator is mediating some kind of message in a non-discursive form. Thus, the interpretation of the relation between sender and receiver is based upon a notion of intentionality (Hohr, 2002; Austring & Sørensen, 2006, pp. 72-76). In the article written by Klausen (2010) ‘intentionality’ is discussed and included as a possible way of defining creativity more precisely. The main point, suggested by Klausen, is that a creative process must include a creating subject with a specific intention. In other words, in order to categorize something as ‘creative’, questions of intentionality must be addressed.

*A creative product must, apart from being novel and appropriate, have been produced with a specific intention. If something is produced by chance and just
happens to be highly useful, people will not deem it creative. (Klausen, 2010, p. 357)

However, the assumption about intentionality is also problematic. First of all, according to communication models and research, coherence between sender and receiver is not guaranteed (e.g., Shannon & Weaver, 1949). Rather, interference and noise is an unavoidable part of communication. Regarding Klausen and Weisberg, the underlying assumption seems to be that the sender’s ‘message’ is understood appropriately. Thus, Weisberg emphasizes in the quoted passage that creativity only exists if ‘the novel idea is produced intentionally’, implying that the ‘novel idea’ is visible, unambiguous and well-defined from the sender’s as well as from the receiver’s perspective. Such a form of communication might exist within some domains, e.g. mathematics, given the rules established within this domain (see Chapter Four, section 4.4.2). However, such unambiguity is hardly the case within the field of aesthetics, within which the space for different interpretations seems much wider (see also Klausen, 2010, p. 356). Therefore, the sender’s ‘novel idea’ might be interpreted quite differently in the social field compared to the initial intention.

From my point of view, Weisberg’s case is not a story about a painter with no intentions. On the contrary, the story is about a painter with intentions who is eventually recognized in the social field for something unintended. Thus, the point is that there is no connection between the painter’s intention and the audience’s interpretation of his work. Accordingly, it seems like Klausen and Weisberg presuppose a shared understanding between sender and receiver for the occurrence of creativity.

In plenty of cases, consistency between sender and receiver might be an appropriate assumption. However, it is equally often stated by artists that they feel misunderstood, implying that a direct connection between sender and receiver may not be presupposed (Barret, 1994; Negus, 2011). According to interactive models of communication, the interpretation of the message might only correspond to the sender’s intention if the sender and the receiver share common references. However, this type of homogeneity can hardly be applied to all cases of communication.

In the light of the above, it appears problematic to suggest that intentionality is an inevitable part of creativity, at least in the way it is interpreted by Klausen and Weisberg. Still, the relation between
the sender’s intention and the receiver’s interpretation seems highly relevant for the study of creativity and represents a key point in the design and analysis of the present research.

5.3.2 Mistakes and coincidences

In the Weisberg case, quoted above, the painting is created by mistake. In the majority of creativity literature, mistakes and coincidences are considered to play some kind of role (e.g., Csikszentmihalyi, 1996, p. 45; Klausen, 2010, p. 356). Amabile draws on the work of Campell (1960) to suggest that many possible ideas and outcomes might be produced by the means of ‘random processes’ of exploration. Without concluding anything specific, she suggests that ‘some degree of chance is always an element’ (Amabile, 1983, p. 80). Boden equally points out that coincidence plays a role: however, she argues, it is a minimal one (Boden, 2010, pp. 41-49).

In general, questions of coincidence and mistakes are seldom systematically addressed. However, from my perspective, at least three reasons might indicate that randomness must be considered more thoroughly when it comes to creative processes. Firstly, my empirical material implies that mistakes and coincidences play an important role. Secondly, technological setups like computers might reinforce the importance of coincidence on a general level (see Part Five). Third, within the field of aesthetics, artists often work quite systematically in order to generate coincidences (Jeongwon & Song, 2002). Therefore, questions of coincidence must be addressed within the field of creativity research as well. In the following, such questions will be discussed by the use of a more chaotic view on creativity, represented by the theory of blind-variation and selective-retention.

5.4 A systematic and a chaotic view on creativity

The theory of blind-variation and selective-retention (BVSR) represents one of the main attempts to understand and describe randomness as an essential part of creative processes. According to Simonton (2007a), Weisberg & Hass (2007), and others, interpretations of creativity may be categorized in two contrasting positions, representing on the one side rationality and logic, and on the other side randomness, or at least, blindness.

At one extreme are those psychologists who see creativity as constituting a systematic, straightforward, and even logical process (Hayes, 1989; Simon, 1973, 1986; Weisberg, 1992). This position is most favored by cognitive
psychologists who argue that creativity is just one particular manifestation of straightforward problem solving [...]. At the other extreme are researchers who see creativity as an unpredictable, chaotic, even inefficient process driven by an indulgent wealth of diverse and unusual imagery, associative richness and originality, and divergent, sometimes even autistic, thinking. (Simonton, 2007a, pp. 329-330)

Simonton is explicitly, according to the author himself, representing the latter position, strongly arguing that the creative process consists of nonmonotonic variants rather than monotonic improvements. In order to elaborate this approach he adopts and further develops the Darwinian theory of blind-variation and selective-retention, originally utilized within the field of creativity by Campbell (1960).

5.4.1 Blind-variation and selective-retention

According to the theory of blind-variation and selective-retention, creativity may be described as a two-stage process, consisting partly of the production of blind variations and partly of selective retention. Blind variation is defined by Campbell as ‘independent of the environmental conditions of the occasion of their occurrence’ and furthermore ‘uncorrelated with the solution, in that specific correct trials are no more likely to occur at any one point in a series of trials than another, nor than specific incorrect trials’ (Campbell 1960, p. 381). Thus, in the words of Simonton:

[V]ariations are blind in the sense that the creator has no subjective certainty about whether any particular variant represents progress toward the goal rather than retrogression from or diversion away from the goal. As a consequence, the creator must rely on what is an essentially trial-and-error process that produces more ideas than will ever be used, and will do so in a manner that exhibits no linear, or at least no monotonic, movement toward the final product. (Simonton, 2007, p. 331)

Hence, blind variation addresses the type of processes, where the creating person does something without precisely knowing where they are heading. However, even though the concept of blind variation may be positioned as the opposite of a systematic, step-by-step and sighted process,
‘blindness’ may not be depicted as an absolute, singular phenomenon. On the contrary, according to Simonton, blind variation contains many different forms of blindness:

[B]lindness is a quantitative, rather than qualitative, characteristic. Variations are not either blind or not blind, but rather variations vary along a scale of blindness. At one end of the continuum are variations that are not blind at all, or minimally so. This is the level of blindness in many everyday problem solving episodes. At the other end of the continuum are variations that are so blind that they can be considered capricious, even unpredictable. This level is what one can sometimes see in certain types of avant-garde art (e.g., aleatoric music). Furthermore, several factors govern the magnitude of blindness in a given variational process. One factor is the nature of the variational procedure itself. For example, algorithmic variations are less blind than heuristic variations, heuristic variations are less blind than free- or remote-associative variations, and the latter are less blind than strictly random variations. (Simonton, 2007b, p. 383)

The notion of blindness may be empirically as well as logically derived. On a logical level one may argue that true novelty only can be produced through a blind process in the sense that you can’t predict something that is entirely new. Accordingly this process must be blind, at least to some degree (Campbell, 1960, Weisberg & Hass, 2007, p. 352). On an empirical level, analysis of creative processes indicates that the creating person is often not working in a straightforward manner. Instead the creator is working with different options, including ideas that are later to be rejected, normally referred to as ‘false starts’.

Even though there might exist a contradiction between theorists adopting a systematic creativity concept as opposed to a more chaotic concept, basically there doesn’t seem to be any disagreement about the existence of some kind of blindness in the creative process. For instance, Weisberg and Hass, who might be categorized as supporters of a systematic view, emphasize that blindness is part of the process, in the sense that a would-be creator will always, to a certain degree, be unable ‘to predict the outcomes of his or her actions, which means that the creative person will be blind at some point’ (Weisberg & Hass, 2007, p. 351).
However, despite the consensus, the disagreements are still substantial. This is, for instance, reflected in the discussion of Picasso and his production of the famous painting, Guernica. Drawing on identical empirical material, Weisberg and Simonton come to very different conclusions regarding the creative process that eventually leads to the final outcome. Simonton describes the process as primarily nonmonotonic in the sense that Picasso is ‘accumulating several possible variants of each main figure and only later select[s] the final representation from that set’ (Simonton, 2007a, p. 340). Hence the process may be described as a ‘messy, inefficient, even chaotic manner of constructing a creative product’ (Simonton, 2007a, p. 340).

On the contrary, Weisberg and Hass are stressing that Guernica primarily is the result of ‘ordinary thought processes’. They argue that the remote and original combinations of ideas conducted by Picasso are actually not a result of blind associations but rather a straightforward result of Picasso’s substantial and wide-ranging experience. In other words, the remote associations ‘might seem that way to us, but that is because we do not know his background deeply enough’ (Weisberg & Hass, 2007, p. 358). Furthermore they question the assumption that creativity is the result of extraordinary breakthroughs. Instead, they emphasize that every ‘creative advance must be an extension of what was already known’. Thus, Weisberg and Hass in general stress the importance of expertise and ordinary thought processes instead of chaotic and random processes (see also Weisberg, 1986, pp. 108-36). Accordingly, this approach to creativity is sometimes described as the ‘expertise view’ (Gabora, 2010b, p. 1)

Although the disagreement about the creative production of Guernica seems to be partly caused by conceptual confusion and different understandings of the word ‘remote associations’ (Simonton, 2007b, p. 384), the different positions are quite visible in the sense that diverse types of processes are highlighted and different types of thought processes are imagined. This is quite clear when Weisberg and Hass attempt to imagine how Picasso might think:

*He now has an idea of the overall structure of the painting. He then considers the four women (the mother who holds the dead child, the light-bearing woman, the fleeing woman, and the falling woman), and he says to himself, ‘How should they convey their emotions? Should they be crying?’ He tries it out: he draws all the women with tears (for the present discussion, it does not matter whether this fits reality; it does not, but it still makes the point), and he*
then says: ‘‘No, too emotional.’’ He removes the tears from one, but the overall result still strikes him as overemotional. He then removes the tears from all of them, but that strikes him as not emotional enough. (Weisberg & Hass, 2007, p. 350)

Even though the above description of Picasso’s work includes trial-and-error as a key component, the narrative mainly highlights conscious and rational processes. Thus, the authors in general downplay the existence of more unpredictable factors like mistakes, coincidence, interactions with the material, etc. Further, the mind is consequently highlighted as the bearer of the creative processes rather than the body. Conclusively, Weisberg and Hass seem to overestimate the importance of sighted conscious processes (see also Chapter Six). On the other hand, Simonton’s suggestion, that Picasso’s work must be described as essentially blind also seems a bit counterintuitive in the sense that Picasso seemingly partly knows where he is heading and partly relies on former experience. In other words, from my perspective, it seems reasonable that Picasso might have some kind of a plan, even though he is still experimenting. Thus, it might be more appropriate to suggest a balance between a systematic and a chaotic version of creativity (see also my discussion of Richard Sennett and the notion of ‘intuitive leaps’ in Appendix T).

5.4.2 Creativity understood as honing

One of the most fundamental problems in the discussion about BVSR is, from my perspective, that there seem to be different notions of which procedural aspects might be included as part of the creative process. According to Simonton, creativity is the very moment in which the new idea is born. This perspective seems to differ from other approaches, such as the theory of honing, primarily developed and promoted by Liane Gabora (2007, 2010a). Gabora, who is mainly preoccupied with cognitive psychology, argues strongly against the theory of BVSR, claiming that creativity primarily must be explained by the theory of honing, according to which creativity does not happen by an individual ‘randomly choosing from among predefined alternatives but by thinking through how something could work’ (Gabora, 2007, p. 364).

Gabora is basing part of her argument on empirical evidence demonstrating that creative people seem to have an identifiable personal style. According to Gabora, Darwinian creativity can not account for such findings, in the sense that blindness doesn’t seem to explain personally derived characteristics (Gabora, 2010b). Further, she argues that an idea or an experience, is not ‘stored in
memory waiting to be selected out from among a set of others’, but rather ‘colored, however subtly, by what we have experienced in the meantime, reassembled spontaneously in a way that relates to the task at hand, and if its relevance is unclear it is creatively redescribed’ (Gabora, 2007, p. 364). In other words, as I read Gabora, the variation will never be blind, as it is formed by the intention, the situation, etc. Accordingly, the creative process is ongoing, rather than an instant of successful blind variation (Gabora, 2010a, p. 182).

In many respects, Gabora’s critique of BVSR seems reasonable in the sense that Simonton seemingly downplays part of the creative process, including the continuously ongoing, step-by-step, and intentionally directed processes. However, some of the critique might be caused by Gabora’s polarized reading of the theory. First of all, Gabora’s understanding of ‘blind variation’ seems to be exclusive in the sense that either something is blind or not. In my opinion, the theory primarily makes sense if Simonton’s relative understanding of blindness is adopted (see the previous section, Simonton, 2007b, p. 383). Accordingly, there are different degrees of blindness that may be connected to different degrees of sightedness. Or, as Weisberg puts it:

[T]he creative process can work with foresight and still be blind. That is, one can be working under the influence of an overall plan (i.e., with foresight), but one can still be blind as to the ultimate realization of that plan in a specific instance. (Weisberg & Hass, 2007, p. 351)

Second of all, it seems like Gabora is focusing exclusively on what is going on inside the head, disregarding the fact that blind variation might be based on external material, such as words, pictures, and sounds.

On the other hand, the concept of honing might eventually demonstrate the weaknesses of the theory of BVSR. Thus, it seems like BVSR only accounts for some phases in a creative process. According to Simonton, honing is ultimately part of the creative process but is only given a minor role: ‘Honing often proves useful in the later stages of creativity after the solution itself has been discovered’ (Simonton, 2010b, p. 392). However, Simonton concludes that such processes, ‘would not be considered highly creative by most researchers in the field’ (Simonton, 2010b, p. 392). In other words, according to Simonton, honing is not included in the theory of BVSR.
The clear distinction between BVSR and the process of honing seems a bit problematic. First of all, it seems ambivalent of Simonton to consider honing a part of the creative process but still not part of the ‘highly creative’ part of the process. Further, it seems unlikely to assume that phases of honing are not intertwined with BVSR. For example, this study demonstrates how blind variations are often not selected instantly but rather incorporated gradually. Thus, the analysis of the case studies in Chapter Ten indicates that Casper produced blind variations that were first to be rejected but eventually incorporated in a slightly new version (Chapter Ten, section 10.3.3). Hence, it seems like processes of honing are connected to BVSR in a subtle way. Besides, this study indicates how BVSR often happens in phases associated strictly with honing. The following story from the third phase of the case studies exemplifies this phenomenon.

5.4.3 Honing and BVSR: The case of Martin

Martin is an experienced musician. In his session, he chose to compose a country song. In the beginning, he only used his guitar and his singing voice. After a few hours, the song was almost finished. That is, the melody, the harmonies, and the lyrics were finished. Now the song only needed to be recorded. In other words, the idea was already formed and the rest of the process might primarily be understood as honing. However, something happened during the recording of the choirs that latter on turned out to be a major advantage. The following description is based on video-observation and interview (the video can be watched online on the following address, https://youtu.be/U137EJL5TZE):

*The production of the choirs is somewhat coincidental. First, Martin records the leading vocal. Then he decides to record some second vocals. However, because of some technical problems he is not able to hear the solo voice while he records the additional voices. This procedure is highly unusual in the sense that people who record a second voice in general always need to listen to the first voice simultaneously. Nevertheless, he tries to sing some other notes in order to create some harmonies but according to himself, it is not a very explicit plan, ‘I am not trying to sing a third above or anything specific’. He records two voices and only after recording both of them does he listen to the music. The result is highly unusual (according to myself and the evaluation group) and Martin is quite happy about it. As he reasons, it is nice and*
Most importantly, the case of Martin demonstrates that creative processes might include partly blind processes. Further, the story also indicates that BVSR might happen in phases of the creative process that are normally interpreted as phases of honing. Thus blind-variation and selective-retention might be rather intimately connected with phases of honing.

5.5 The role of expertise

According to the theory of blind-variation and selective-retention a truly novel idea is also truly blind. Such a statement is rather important in regard to the question of creativity and expertise in the sense that prior knowledge might hinder blindness. In other words, prior domain-specific experience might influence the creative action in a specific non-random way. In the following this issue will be addressed.

5.5.1 Expertise and blindness

As discussed in the above, Dean Keith Simonton is in general emphasizing the importance of blindness. However, according to Simonton, expertise is one of the factors that might limit the degree of blindness:

\[\text{A particularly critical factor moderating the degree of blindness are the constraints imposed by accumulated expertise. These constraints can intercede in a number of ways. For instance, the constraints can determine what particular ideas, concepts, or forms enter into the combinatorial hopper. The constraints can also influence how those ideas, concepts, or forms are combined. Most commonly, some combinations will be bestowed higher a priori probabilities than other combinations. (Simonton, 2007b, p. 383)}\]

However, the notion that former experience somehow stands in the way of novel associations might contradict the notion that creativity requires an extensive number of experiences to be combined in novel ways (see discussion of Koestler above, section 5.2.3). In other words, on the one hand a
substantial number of experiences are required in order to make remote associations, and on the other hand such experiences might represent constraints in terms of creating something new. Therefore, BVSR might lead to different conclusions with regard to the role of expertise. Further, according to BVSR theory, the creative process also contains the phase of selection. Accordingly, a high degree of blindness in the first phase of the process, also has to correspond with a specific selection in the second phase. Thus, one might argue that a two year old child is capable of playing blindly on a piano but is hardly able to make a proper selection without any domain specific expertise (see below).

5.5.2 Observation: to make the selection

_I am observing a group of three musical novices. They are sitting by the computer. They are trying to cut and loop a sample in different ways. They have seemingly limited control over the process and they do not seem to be able to make the sample fit as they wish. Suddenly, it sounds remarkably great. The music flows in a peculiar, messy, and yet pleasant way. I am thinking ‘oh don’t delete it, oh don’t delete it!’_. One of the members of the group says, ‘_it sounds terrible, it has to be deleted_.’ The group delete it. (Memos, the second phase of the casestudies, 2012)

Obviously, the case demonstrates that I and the three group members have different preferences and experiences that naturally influence the process of selection. From my point of view, the musical detail could have been a great hit within a rap music context. However, from the group member’s point of view, the musical detail sounded terrible. Because of their position as novices and their lack of technical control they make blind variations. However, they might not possess the proper domain-specific experience in order to recognize and select the valuable ideas. That is, at least not from my perspective.

5.5.3 Sighted and blind processes: Cæcilie Trier

I will finish this chapter with a reference to an interview that I conducted with the professional composer, Cæcilie Trier. The interview with Cæcilie took place while she was working on her latest album (December, 2014). Accordingly, this album became the main focus in our dialog.
In the interview, she describes her album as the result of the combination of many different ideas. According to Cæcilie this way of working is quite normal; ‘I am always working with at least four different thoughts or approaches’. With respect to this specific album she outlines five different sources of inspiration: (1) the famous book, *Lolita*, (2) the philosopher Gurdjieff and the Gurdjieff dances, (3) the author Gertrud Stein and her writing, (4) Dadaism and their collage technique, and finally (5) a specific guitar motif made by Hans Haug.

On the one hand these sources of inspirations seem to emerge coincidentally. She was inspired by Dadaism because she had recently been asked to compose music for a Dadaist cabaret performed at the Museum of Arken. Equally, she coincidentally became aware of the composer Hans Haug because her father, Lars Trier, played some of his music at a concert. But Cæcilie is not just passively receiving coincidentally emerging inspiration. Conversely, she described to me how she is always looking for inspiration. She is always somehow focused on her next project. Thus, Cæcilie’s explanations seems to be in line with Gabora’s interpretation of the creative process in the sense that the sources of inspiration are not just ‘stored in memory waiting to be selected out from among a set of others’, but rather ‘reassembled spontaneously in a way that relates to the task at hand’ (see above). In other words, the process contains sighted as well as blind elements.

In the interview, Cæcilie described how the most essential part of the creative process is mental. Accordingly, most of her energy and time is spent on the construction of the main idea. In this specific project the main concept was built on the following principles:

- Lyrics based on the book Lolita
- One long orchestral musical piece instead of short songs
- Music that is somehow compatible with Gurdjieff dances
According to Cæcilie, the composition of the music itself is relatively effortless. When the concept is constructed, it is only a question of ‘filling out the empty spaces’, as she puts it. This distribution of energy is indicated in the drawing below; the smallest space represents the time spent on music-making and the largest room represents the time spent on the construction of the main concept.

Picture 5.2: To the right, time spent on thinking; to the left, time spent on music-making; to the upper-left, time spent on practical stuff.

According to Cæcilie’s descriptions it seems like the phase of music-making is relatively sighted in the sense that she is just ‘filling out empty spaces’. From this point of view, Cæcilie’s description of a mental creative process followed by straightforward music-making seems to be related to Simonton’s distinction between moments of extraordinary creativity and phases of ordinary honing (see discussion above). In the interview, I was a bit puzzled by this seemingly sighted process of music-making. Thus, I asked her about the interaction with the material. First of all, I asked her whether she sometimes experiences happy mistakes that might lead her in other directions:

*Interviewer: Don’t you ever make a mistake while you are playing the cello?*
*Cæcilie: Of course I do. That’s obvious. I play wrong notes all the time. And I am thinking ‘what was that?’ I have to record it’.*

*Interviewer: So, imagine that you are in complete control. And you never make a mistake. Would that be a problem?*
*Cæcilie: No, that would be wonderful.*

*Interviewer: But if the unexpected does not come from your interaction with the instrument and the surroundings, then where does the unexpected come from? Can all the ideas come from your mind alone?*
Cæcilie: Where does it all come from? It comes from the world! Musical techniques are not the issue. It is not a problem. It is only a problem if you mentally get stuck. If you stop exploring the world. Technique will never be a problem. That is not interesting at all. I think my approach to music making is more like an architect. I’m not like a gardener watering the flowers and watch something unexpected grow. I have a building I am going to build. I have a sketch. Naturally, unexpected things might develop inside the building. But the building is formed a priori. You know, I am not making a song out of a mistake on the cello. I have a masterplan. And then I sit down and start to play. And I welcome all the mistakes. They are part of the picture.

Cæcilie’s description of creative work reflects general notions about ‘remote associations’ or ‘bisociation’ in the sense that she combines different ideas and matrices. However, from Cæcilie’s perspective, the important remote associations happen primarily on a mental level. When the construction of the masterplan is done, the music-making seems to be a relatively sighted process. This approach seems to support a distinction between body and mind. I will return to that central issue in the following chapter. (In the picture below, Cæcilie says ‘where does it all come from? It comes from the world!’)

5.6 Summing up

In this chapter a number of characteristics typical associated with creative processes have been presented, including heuristics, experimentation, and bisociation. Further, different contradicting positions were identified and discussed. Most importantly, a systematic approach to creativity and a chaotic approach to creativity were discussed and a balance between the two positions suggested. In that respect, the influence of expertise has been discussed with regard to the different positions.
Finally, the role of intentionality was considered and it was argued that consistency between the sender’s intentions and the receiver’s interpretation may not be presupposed.

The discussions which took place in the chapter also led to some unresolved questions that call for further consideration. First of all, the presented approaches to creativity seem to be rather focused on the intellect and processes of thinking. Accordingly, the material, the craftsmanship, and the body are partly left out. Thus, I will include these issues in the following chapters.
Part Three: Creativity and expertise
Chapter Six: Body, intuition and reflection

6.1 Expert performance

I am trying out different things with the piano. I mean playing a little. ...Maybe something I have heard before, for instance within the genre of blues. Playing some notes, for instance from a scale. Trying to fiddle a little with the melodies I know. Melodies I have played before. And – because I don’t want to make a complete copy – I have also tried to make a new melody. So I have tried – based on what I know – to ‘plimp’ a bit on the keys. And then suddenly I could hear ...I have discovered something in this way. How it should sound. And I have worked in the same way with the guitar and the bass. (Jonas, interview, third phase of the case studies, 2012)

6.1.1 The paradoxes of creation

In the quoted interview presented in the above, the skilled pianist, Jonas, is trying to describe how he creates music. He is obviously drawing on musical knowledge and experience. He is incorporating the body. He is turning on and off intellectual attention and reflection. He is looking for something. He is imitating what he knows, but he still hopes to come up with something new. Many of these descriptions seem paradoxical. How can Jonas suddenly hear something new when the sound is actually produced by himself? How can the imitation and reproduction of existing material lead to novel ideas? What is the point in ‘plimping’ on the piano, does he know what he is doing or doesn’t he? Thus, Jonas’ descriptions produce a number of questions with respect to creativity and the role of expertise.

In the following chapter, I will try to address these fundamental issues and paradoxes regarding the relation between expertise and creativity by the adoption and discussion of different learning theories. The overall question might be outlined as; ‘how is it possible to adopt skills and rules belonging to a domain and yet be able to change these rules in an appropriate way?’ Thus, the
question might mirror common philosophical key themes with regard to the battle between social
determination and personal free will. Accordingly, some theories of learning might be well suited to
explain why people behave like all others, whereas other theories might be more suitable to explain
why people behave differently. This main topic seems to address not only the balance between
recreating and creating from a learning perspective but also the fundamental balance between
novelty and appropriateness from a philosophical perspective. In other words, how is it possible to
understand the journey from the well-known to the un-known? How is it possible to move from
what we know to what we don’t know by applying what we know?

When addressing this key question, other questions arise. Firstly, the characteristics of learning and
expertise must be explored. Secondly, the role of reflection and intuition must be investigated.
Finally, the dichotomy between body and mind must be considered. Nonetheless, before I begin in
earnest, a predominant notion about learning will be presented as it forms one of the main
hypothesis in this chapter.

6.1.2 Automatized behavior versus reflection

It is quite common to make a distinction between (1) intuition understood as fast, automatic and
effortless, and (2) deliberate thinking understood as reflective, slow, controlled, and full of effort
(Kahneman 2011; Charness, Ericsson, Krampe & Moxley, 2012). According to this perspective a
taxonomy of learning might be constituted by two stages. First the learning subject engages in
deliberate praxis, e.g. when a pupil learn how to play the piano. Next, the learning subject
automatizes certain skills and the subject’s attention can now be used for other matters. However,
such understanding of learning implies that learning might also leads to a closed or entrenched
perspective in the sense that the performer partly loses conscious control over the performance.

"As the subject’s behaviour is automatized the current behavioural repertoire becomes
fixated and the subjects lose their conscious control over intentionally modifying and
changing it." (Ericsson, 1998, p. 90)

Hence, this fixation might lead to a situation where, ‘[t]he expert can become so entrenched in a
point of view or a way of doing things that it becomes hard to see things differently’ (Sternberg,
1996, p. 347). The example with Anders included in the previous chapter indicated that such a
mechanism sometimes seems to be the case. In this chapter, I will investigate and discuss this phenomenon further through the adoption of different perspectives on expertise and learning.

6.1.3 Chosen perspectives on learning

Theories of learning may be divided into different categories according to distinctive perspectives and approaches. For instance, the influential Danish scientist of lifelong learning, Knud Illeris, suggested that learning theories might be categorized according to three main foci; cognition, feeling, and interaction (also known as functionality, sensitivity and integration) (Illeris, 2009). I find the categorization productive in the sense that it offers a possible way to comprehend the overall landscape of learning theories. However, when it comes to describing the expert in this specific study, I find it useful to draw a twofold distinction that corresponds with the outlined questions in the above. Firstly, I draw a line between psychological cognitive theories of learning and phenomenological approaches to the intellect and the body. That gives me an opportunity to discuss complex questions related to reflection, intuition, body, and intellect. Secondly, I draw a line between theories of learning with a focus on the individual and theories preoccupied by social communities (a similar distinction is suggested in Andersen, 2011). This gives me an opportunity to discuss the balance between freedom and tradition. Further, this distinction mirrors the attempt to understand creativity as a social as well as an individual phenomenon (see Chapter Four, section 4.4). In this chapter learning from an individual perspective is the main focus whereas learning from a social perspective is the main topic in Chapter Seven.

6.2 What is an expert?

In my discussion of the expert I primarily include theorists that position themselves as opponents to what might be understood as a cognitivist or a technical-rational approach, e.g. Dreyfus & Dreyfus, Schön, and Polanyi. The reason for this choice is that psychological cognitivism has seemingly failed to answer some of the fundamental questions regarding the behaviour of the expert. However, these traditions partly provide the foundation upon which alternative theories are formed. Furthermore, such traditions still contain valuable and fruitful perspectives on the performance of expertise.

6.2.1 Psychological cognitivism
Psychological cognitivism might be understood as a rather heterogeneous tradition of theorists and researchers that are mainly preoccupied with the understanding and modelling of cognitive processes. Dominating figures within this tradition is for instance Jean Piaget, John Anderson, and Frederic Charles Bartlett. In line with behaviourism, psychological cognitivism adopts a positivistic approach to science with an emphasis on hypotheses and deductive methods, and the adoption of objectivism as a scientific ground figure (Drisoll, 2000; Wilson & Myers, 2000). Because of the attempt to understand information processing mechanisms, cognitive psychology is strongly related to research domains such as artificial intelligence and computer science (Farrington-Darby & Wilson, 2006). In other words, the creation of artificial intelligence and the understanding of information processing mechanisms might go hand in hand. This twofold strategy is also adopted by Margereth Boden, as mentioned in Chapter Four.

A prominent example of psychological cognitivism (also known as cognitive psychology) is the ACT-R theory developed by John Anderson. According to this theory, skill acquisition might be understood according to three stages (Anderson, 1982, 1985). In the first stage (the cognitive stage) skill acquisition is understood mainly as a process within which the learner receives information in declarative form, that is, procedures, manuals, rules, verbal instructs, e.g. In the second stage (the associative stage) the declarative knowledge is transformed into procedural knowledge through a process of rehearsal and performing. Accordingly, the learner is now able to perform without having to think about the rules and the procedures. Finally, the learner reaches the autonomous stage, within which the learner is now able to perform rapidly and in an automated fashion while still being capable of selecting the most appropriate procedure to apply.

According to Anderson’s stage model of skill acquisition there seems to be a direct connection between the declarative formulated rules and the automated procedures that are developed by the learner. In other words, the expert is to a certain extent following explicit rules and procedures. Such a theory of learning is related to what Schön describes as the technical-rational approach to professions, skills, knowledge, and expertise (Schön, 1983).

6.2.2 Technical rationalism

According to Schön, the tradition of technical rationalism suggests that true knowledge must be gained through explicit empirical collections, through the use of logic, and through deductive-
hypothetical experiments (Schön, 1983). One of the main goals within this tradition is to build up a solid ground of true knowledge and thereby escape the uncertainty represented by other forms of knowledge, including intuition, habits, religion, trial-and-error, and norms. Furthermore, the aim is to reach some kind of general knowledge of the world that may be summed up in solid rules and categories. Schön names a number of thinkers preoccupied by professions as the representatives of the technical-rational approach, including the sociologist Wilbert E. Moore and the organizational psychologist Edgar Schein (Schön, 1983, pp. 29-31).

According to the technical-rational perspective, an expert, e.g. a doctor, is not supposed to follow his intuition, his beliefs, his morals etc. when treating the patient. Instead, he is supposed to follow the rules produced by positivist science. Thus, the expert becomes first and foremost an expert because of his comprehensive knowledge of categories and rules as well as technical skills that enable him to conduct certain complex operations. From this perspective, intuition and lack of explicit reflection is a counterproductive element. This is a normative argument as well as a basic notion of how a successful expert behaves. However, empirical evidence indicates that experts behave differently, even within the field of traditional positivistic science (see below).

6.2.3 Problems with psychological cognitivism and technical rationalism

As mentioned in the above, psychological cognitivism and the technical-rational approach are related in the sense that expertise is understood primarily as rule-based. However, this perspective on learning can be criticised in the sense that it fails to explain important questions concerning expert behaviour. First, the attempt to build up artificial intelligence based on rules has not yet succeeded (Dreyfus, 1979, p. 285, Flyvbjerg 1990, Russell. & Norvig, 2010). Furthermore, observations of experts and interviews with experts do not seem to support technical-rational interpretations of the human intellect in the sense that intuition, experience, and trial-and-error seem to be the favourite tools applied by the experts (Schön, 1983, p. 46). Second, the technical-rational approach seems to focus on problem-solving rather than problem-identification and, thus, seems to neglect crucial parts of the work of the expert. Thirdly, it seems like the rule-based understanding of intelligence fails to explain expert behaviour in complicated unique situations (Schön, 1983, p. 46). Fourth, the role played by the body is seemingly neglected.
This critique has led to other attempts to understand intelligence and expertise. In the following, I will discuss some of the important and most influential researchers trying to understand intelligence in an alternative way.

### 6.2.4 To be an expert according to Dreyfus and Dreyfus

Hubert Dreyfus and Stuart Dreyfus provide an alternative to psychological cognitivism and technical rationalism in their book *Mind over machine: the power of human intuition and expertise in the era of the computer* (Dreyfus & Dreyfus, 1986). In general, their research is based on a positivistic tradition, in the sense that they are trying to understand intelligence by the means of artificial intelligence. However, when artificial intelligence is unable to provide answers, they adopt other epistemological positions, including the phenomenology of perception and embodiment (Dreyfus & Dreyfus, 1998).

Dreyfus and Dreyfus attempt to demonstrate what constitutes expert behavior through the introduction of a taxonomy of competence. The model consists of five stages addressing the different types of behavior typical for a novice, an advanced beginner, a competent individual, a proficient individual, and an expert. Initially, the novice is given ‘rules for determining actions on the basis of these features, like a computer following a program’ (Dreyfus & Dreyfus, 1998, p. 4). In the next stage, the advanced beginner can relate to former experiences as well as rules. It follows that the advanced beginner can relate to ‘new situational aspects, recognized on the basis of experience, as well as to the objectively defined non-situational features’ (p. 5). In the third stage, the competent has acquired more experience and is therefore able to recognize many aspects of a situation. This represents a problem in terms of overload.

> To cope with this overload and to achieve competence, people learn, through instruction or experience, to devise a plan, or choose a perspective, that then determines which elements of this situation are to be treated as important and which one can be ignored. (Dreyfus & Dreyfus, 1998, p. 6)

In the next phase the performance becomes increasingly dependent upon intuition:
If, as the learner practices his skill, events are experienced with involvement, the resulting positive and negative experiences will strengthen successful responses and inhibit unsuccessful ones. The performer’s theory of the skill, as represented by rules and principles, will thus gradually be replaced by situational discriminations accompanied by associated responses. (Dreyfus & Dreyfus, 1998, p. 7)

Finally, according to Dreyfus and Dreyfus, the learning subject in the expert-stage is even more experienced and is therefore able to make more subtle discriminations (Dreyfus & Dreyfus, 1998, p. 9).

One of the striking implications of the outlined taxonomy is that the expert might not know what she is doing in a traditional explicit intellectual sense of the word. According to the outlined taxonomy, the novice initially applies some kind of analytical rationality in the sense that she is following specific rules. However, intuitive processes based on the experts’ initially chosen perspectives and plans, as well as former experiences, successes, and failures, eventually replace such conscious contemplation. This allows the expert to act appropriately and immediately, in spite of the overwhelming volume of information and options. On the other hand, these types of processes might result in a closed perspective. First, the expert is relying on former experience. Second, the expert relies on a specific perspective or plan. Third, much information is ignored and consequently possible alternative options are not considered. Fourth, the expert will not be able to describe the process; the process is, in a certain way, invisible to the expert (Dreyfus and Dreyfus, 1999, p. 62). Therefore it seems more difficult to actually scrutinize and examine a process in order to make improvements or developments.

6.3 Donald Schön and the role of reflection

Donald Schön’s approach to knowledge and expertise is similar to the approach of the Dreyfus brothers in several ways. First of all, he criticizes technical rationality as an appropriate notion of expertise and suggests that expert performance is much more intuitively based. Secondly, he suggests that experts know more than it is possible to say with words. Finally, he is focused on how to incorporate and include the body in the outlined theoretical framework. However, Schön seems to grant reflection a much more central position when it comes to describing expert behavior (Schön, 1983).
6.3.1 The theory of reflection-in-practice

Schön divides professional knowledge into three categories, ‘knowing-in-action’, ‘reflection-in-action’, and ‘reflection-on-action’. Knowing-in-action represents the kind of processes where the expert knows what to do spontaneously:

There are actions, recognitions, and judgments, which we know how to carry out spontaneously; we do not have to think about them prior to or during their performance. We are often unaware of having learned to do these things; we simply find ourselves doing them. In some cases, we were once aware of the understandings which were subsequently internalized in our feeling for the stuff of action. In other cases, we may never have been aware of them. In both cases, however, we are usually unable to describe the knowing which our action reveals. (Schön, 1983, p. 54)

Accordingly, the processes taking place are highly intuitive and unconscious, similar to the behavior of the expert in Dreyfus and Dreyfus’ taxonomy. However, according to Schön, sometimes the processes of action involve reflective thinking, which might take place during the action (reflection-in-action) or after (reflection-on-action). Such a reflection may primarily be caused by unexpected events.

The practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomena before him, and on the prior understandings which have been implicit in his behavior. He carries out an experiment which serves to generate both a new understanding of the phenomena and the change in the situation. When someone reflects in action, he becomes a researcher in the practice context. He is not dependent on the categories of established theory and technique, but constructs a new theory of the unique case. (Schön, 1983, p. 68)

Thus, the expert behavior is not strictly unconscious or intuitive. Rather the expert continuously scrutinizes his own practice. Yet Schön still emphasizes that knowing-in-action might in some cases inhibit reflection (Schön, 1983, p. 58 and pp. 226-240). In particular if the expert is afraid of uncertainty and wishes to appear as an authority (Schön, 1983, p. 67). However, in general, Schön
is very optimistic when it comes to the expert’s ability to work intuitively and yet being able to reflect on action and develop praxis.

6.3.2 What promotes reflection-in-action

In order to examine to what degree the expert scrutinizes their own praxis, it may be productive to look a bit closer on what promotes such reflection. As mentioned in the above, reflection might be caused by a surprise or something that is not working properly. From this perspective, Schön seems to be inspired by the work of John Dewey and his way of conceptualizing the key forces in the process of learning (Dewey, 1938). Schön provides several pieces of empirical evidence of such cases in his book, *The Reflective Practitioner* (1983). For example, Schön demonstrates how a psychotherapist is forced to reframe a situation because it appears to be essentially different from what he has experienced before. On the other hand, Schön is applying examples that might not be understood as surprising or different. For instance, he suggests that improvisations of jazz musicians are characterized by reflection-in-action: ‘Improvisation consists of varying, combining and recombining a set of figures within the schema which bounds and gives coherence to the performance’ (Schön, 1983, p. 55). Now, of course improvisation might represent a unique situation, which calls for reflection-in-action. Still, it seems unclear why improvisations promote reflection-in-action rather than other type of activities.

6.3.3 Reflection: the key to change?

One of Schön’s main agendas is to demonstrate that praxis represents a know-how that is not to be considered less valuable than formal theory or research (Schön, 1983, p. 26; Schön, 1987). Accordingly, Schön tries to show that praxis is inventive and visionary rather than conservative and reproductive. Thus, it seems important to Schön to emphasize the expert’s reflections and abilities to examine and change perspective and performance. This matter of interest might not be a problem in the sense that all research is intertwined with intentions and represents a specific worldview. However, Schön fails to describe what actually promotes reflection, beyond that it is something that the practitioner finds ‘uncertain or unique’ (Schön, 1983, p. 68). Hence, it seems too optimistic just to expect that reflection will arise when it is needed.

The described ambiguity might be further reinforced by the way Schön approaches the phenomenon of reflection. On the one hand, reflection is considered the key to change practice. Accordingly,
actions not comprised of some kind of reflection may not change practice. On the other hand, Schön argues that humans are following rules that they can not describe (Schön, 1983, p. 55). It seems somehow unanswered, at least from a rational analytical point of departure, how humans can reflect upon something that they are not able to describe. This issue will be discussed further in the following.

6.4 The things we don’t know

The notion of tacit knowledge is in varying degrees central to the understanding of an expert presented in the above. In other words, Dreyfus as well as Schön stresses that, ‘we know more than we can tell’. Again the question of reflection might be reinforced. In other words, is it possible to reflect upon something that we cannot talk about? And furthermore, is it possible to explore and change something that it may not be possible to reflect upon? The question is one of the key issues among authors preoccupied by Polanyi’s theoretical framework (see for example Andersen, 2011). However, there seem to exist different interpretations of the implications of tacit knowledge in terms of reflection and change.

6.4.1 Tacit knowledge and Polanyi

According to Polanyi, knowledge can be understood as either tacit or focal. Focal knowledge is knowledge about the phenomenon in focus. For instance, when reading a text, the reader is normally focused on the precise meaning of the text. Conversely, tacit knowledge is the type of knowledge that is applied in order to manage the phenomenon in focus. For instance, when reading a text, competences like sight, language, semiotics, etc., are applied. Even though this type of knowledge might be tacit in a specific situation, it is still possible to change perspective and direct attention to the partial elements. This is done by applying so-called subsidiary awareness, whereby people are able to scrutinize or reflect upon the tacit knowledge. However, when doing so, it is not possible to simultaneously apply so-called focal awareness, that is, to direct attention to the complete project in hand. For instance, when playing guitar it is not - according to the theory of Polanyi - possible to direct partial attention to the single finger-moves and still be aware of the total entity of body and sound. It is simply two different modes of awareness. Yet, even though it is not possible to reflect and perform simultaneously, it is still possible to scrutinize practice. In other words, people can return to focal awareness after a moment of subsidiary awareness. Accordingly
new knowledge and recognitions might be established (Polanyi, 1966).

*It should be noted that this dual awareness is not due to the fact that we can not become focally aware of all the subsidiary clues entering into an integrated meaning. Suppose that it would be possible, at least in principle, to identify all the subsidiaries involved in achieving a particular focal integration. We would still find that anything serving as a subsidiary ceases to do so when focal attention is directed on it. It turns into a different kind of thing, deprived of the meaning it had while serving as a subsidiary. Thus subsidiaries are – for this reason and not because we cannot find them all – essentially unspecifiable.* (Polanyi & Prosch, 1975, p. 39)

Accordingly, tacit knowledge is not tacit in the sense that it is not possible to identify. The point is that tacit knowledge changes into something different when subsidiary awareness is deployed. Thus, it seems like the examination of knowledge might be problematic for at least three reasons. First, Polanyi indicates that identifying the total volume of partial elements of tacit knowledge in reality might be problematic. This is rather evident when he writes: ‘Suppose that it would be possible, at least in principle, to identify all the subsidiaries involved in achieving a particular focal integration’ (Polanyi & Prosch, 1975, p. 39). Secondly, it seems questionable how one can reflect upon something given that the thing you reflect upon ‘turns into a different kind of thing’ when reflection is applied. Finally, it seems like Polanyi rejects language as a proper tool to investigate tacit knowledge: ‘To assert that I have knowledge which is ineffable is not to deny that I can speak of it, but only that I can speak of it adequately’ (Polanyi, 1958a, p. 91). Consequently, proper examination of tacit knowledge seems problematic for several reasons. Thus, some writers argue that Polanyi’s theory in general does not leave room for reflection (e.g., Scheel). Yet others scholars stress that change is facilitated by the momentary attention on partial elements of the tacit knowledge as explained by Polanyi (Sigrell, 2006).

### 6.4.2 Schön, Dreyfus and Polanyi: intuition and reflection

One of the central questions discussed in the above, is how it is possible to reflect upon and change something that is somehow invisible or incomprehensible? Relying on the introduced authors it seems like the question is partly left unresolved. This circumstance might mirror a general problem in terms of understanding the diametric concepts of intuition-reflection and body-mind. As I read
Schön, knowing-in-action represents intuition whereas reflection-in-action involves some kind of process of conscious and deliberate thinking. This reading is reinforced by the fact that Schön exclusively deals with situations within which reflection-in-action is understood as something explicit and conscious. For instance when Schön describes how an architect reflects on different solutions to a specific problem (Schön, 1983). Further, other researchers inspired by Schön seem to understand reflection-in-action in a similar way. Thus, Randi Andersen emphasizes how Schön is primarily focused on language and thinking rather than intuition and tacit knowledge (Andersen, 2011, p. 52).

Polanyi and Dreyfus seem to grant reflection a less predominant role. According to Dreyfus and Dreyfus, the expert’s work is primarily intuitive, and they are not basically able to describe in detail the reasons for their decisions. According to Polanyi, tacit knowledge plays a dominant role, and many aspects of knowledge might not be properly understood through language. Yet, in both cases, it seems like reflection is still understood as the key to development and change. Thus, Polanyi argues that attention might be directed towards parts of tacit knowledge, whereby reflection-on-action is permitted. Similarly, Dreyfus and Dreyfus hold that intuition is the key element of expert behavior, yet still stresses that explicit reflection - for instance among colleagues within a certain profession - might be necessary in order to scrutinize practice (Dreyfus & Dreyfus, 1998, p. 10). Thus, somehow reflection is still given a privileged position. This might reflect a general dichotomy of body and mind that seems to produce rather solid categories and dichotomies when it comes to the description of knowledge. In other words, Schön constructs a dichotomy of knowing-in-action and reflection-in-action, Polanyi constructs a dichotomy of focal and subsidiary awareness. Dreyfus and Dreyfus rely on a dichotomy of intuition and deliberate reflection. The question is whether such dichotomies are adequate. In the following, the perspectives of Merleau-Ponty and Richard Sennet will be discussed in order to introduce a possible alternative to such distinctions.

6.5 The body-mind dichotomy

The body-mind dichotomy is a well-known construction within Western culture and is also predominant within the field of research by which this thesis is inspired. Thus, Folkestad, one of the most influential researchers within the field of music, creativity and technology, writes:
The strongest argument for using computerized tools in studying creative music-making is that for an instrumentally untrained person, for whom most musical ideas would be impossible to realize using conventional instruments, the equipment makes it possible to implement most musical ideas into an auditory result, with a minimum of instrumental technical skills (Folkestad, 1996, p. 98)

The assumption suggested by Folkestad is quite typical within the literature concerned with technology and creativity, and also plays an important part in this very thesis (see also Colley, Comber & Hargreaves, 1993). However, the approach may be criticized for reinforcing the dichotomy of body and mind in the sense that the ‘musical ideas’ are detached from the bodily action. In other words, the notion indicates that the mind produces an idea which is subsequently executed by the body.

6.5.1 Reassembling the body and the mind

Merlau-Ponty is one of the main critics of the cognitivist approach presented in the above. According to Merlau-Ponty, our perception and our behavior are founded in our body. The world is understood and experienced through our body and our body interacts with the world without the interference of an intellectual control tower.

In far as I have hands, feet, a body, I sustain around me intentions which are not dependent upon my decisions and which affect my surroundings in a way which I do not chose. (Merlau-Ponty, 1962, p. 440)

Phenomenology bases the perception of the world and the reaction to the world on the innate structures of the body, general skills, like walking, and cultural skills, like playing an instrument (see also Dreyfus and Dreyfus, 1998, pp. 2-3). Hence, the world affords the body the ability to do something, e.g. the floor affords walking, and the guitar affords playing a chord (see also Gibson, 1977). In order to describe such types of affordance, Merlau-Ponty refers to the notion of equilibrium. From this perspective the body will seek to maintain or archive equilibrium with the surrounding world.
Whether a system of motor or perceptual powers, our body is not an object for an ‘I think’, it is a grouping of lived-through meanings which moves towards its equilibrium. (Merlau-Ponty, 1962, p. 153)

A related approach is found in Sennett’s *The Craftsman*. Sennett’s perspective is rooted in Polanyi’s and Merlau-Ponty’s phenomenology of embodiment. However, he presents a philosophical investigation explicitly concerned with art and craftsmanship. According to Sennett, craftsmanship is an indispensable part of a creative process. Thus, art without craftsmanship simply doesn’t exist (Sennett, 2008, p. 65). The point is that mind and body are combined. The artist or the craftsman ‘thinks’ with his body. Thus there are no borders between technique and expression (Sennett, 2008, p. 155). In the chapter about ‘the hand’, Sennett attempts to describe the ‘unity of head and hand’.

From a phenomenological point of departure, Sennett argues that the craftsman somehow gets absorbed in the process of creating and thus stops being self-aware; ‘we have become the thing on which we are working’ (Sennett, 2008, p. 174). However, in other parts of the book, he describes creative processes as something that includes reason, ‘it is reasoning, but not of a deductive sort’ (Sennett, 2008, p. 212). Furthermore he seems to establish a difference between intellect and body, even though he still attempts to unify them, e.g. when he describes the ‘intelligent hand’ as a kind of coordination between hand, eyes, and brain (Sennett, 2008, p. 174). Accordingly, it still seems somewhat unclear how to understand the integration and division between mind and body.

Typically for the above discussion is that the debated writers all seem to argue against some kind of superiority of the mind over the body. Needless to say, such criticism of a cognitivist approach to human behavior seems appropriate. For instance, when Sennett quotes Immanuel Kant for writing that ‘the hand is the window on to the mind’ it seems pretty obvious that such a notion is too simple. However, the question is whether Sennett’s approach becomes to ideological. For instance, when Sennett stresses that the hand is not ‘the servant’ he seemingly draws on a political discourse preoccupied by the distribution of power. Actually, in many respects, Sennett’s agenda is similar to Schön’s in the sense that they both attempt to emphasize the value of professional tacit skill and thus change the balance of power between craftsmanship and intellectualism (e.g., Sennett, 2008, pp. 144-146). In other words, by arguing that the hand is not the servant of the mind, they equally argue that the craftsman or the professional does not need to serve the intellectuals or the scientists. At least, this is an obvious way to interpret the two authors.
Accordingly, their attempt to understand expertise turns into an ideological project. This might not be a problem. However, the fusion of mind and body leads to some unanswered questions. Most importantly, Sennett, as is the case with Merlau-Ponty and Polanyi, might neglect individual accounts that support a division between mind and body: that is, people who, for instance, feel that they need to take a break from the manual process of creating in order to reflect upon the manual strategy and subsequently return to the manual process with a changed perspective (reflection-on-action, reflection-in-action). In my view, it seems unclear what constitutes such a reflective process if it is not ‘the mind’.

In the light of the above, the argument against a cognitive rational approach might lead to a perspective from which the mind is totally neglected. Rather, we need an approach that includes processes of unity between body and mind as well as division between body and mind. Accordingly, the divergent approaches outlined might prove productive in order to understand different perspectives of creative processes in the present study.

### 6.5.2 Reflection and consciousness

The body-mind dichotomy is related to notions about reflection in the sense that the mind is often associated with deliberate thinking through which the body can be controlled. However, in the light of the previous sections it seems like the definition of reflection is indistinct. This epistemological problem seems to be related to the ambiguous interpretation of consciousness. Thus, the role of consciousness will be discussed briefly in the following.

During the twentieth century the privileged role of consciousness has been challenged by developments within different fields of study. In the book *The User Illusion* (1998) the Danish journalist of science, Tor Nørretranders, sums up and elaborates upon the many scientific contributions to the field. Primarily from a traditional positivistic and experimental point of departure he argues that consciousness must primarily be understood as a kind of secretary of the nonconscious (Nørretranders, 1998, p. 303). The argument falls in several parts. First of all, Nørretranders refers to experiments indicating that decisions we believe are made consciously are apparently made nonconsciously (Nørretranders, 1998, pp. 219-221). Second of all, Nørretranders refers to experiments indicating the limited bandwidth of consciousness compared to the amount of sensory data input (Nørretranders, 1998, p. 126). Moreover, he refers to experiments indicating the
slow speed of consciousness compared to the relatively fast speed of nonconsciousness (Nørretranders, 1998, p. 128). Finally, Nørretranders refers to experiments with split-brain patients, indicating that consciousness is inventing arbitrary explanations in order to explain nonconsciously initiated actions (Nørretranders, 1998, p. 283). Such evidence, apart from a substantial amount of supplementary experiments, reflections, hypotheses, and approaches, leads Nørretranders to conclude that:

Consciousness is a peculiar phenomenon. It is riddled with deceit and self-deception [...] the conscious I is happy to lie up hill and down dale to achieve a rational explanation for what the body is up to [...] when the consciousness thinks it determines to act, the brain is already working on it [...]’

(Nørretranders, 1998, p. 286)

This description of the consciousness is of course highly controversial in the sense that consciousness is denied a privileged position and is first of all understood as a kind of slow working imposter. Accordingly, the notion has met substantial criticism for varied reasons and from different positions (see also Appendix S). However, the relatively unclear role of consciousness seems difficult to deny.

So, what really is the role of consciousness, besides making up idiosyncratic stories about what is going on? According to Nørretranders, consciousness is a kind of secretary, manager or boss that initiates different kinds of processes. For instance, when learning a skill, the consciousness initiates the process of practice. However, when the practice starts, the nonconscious takes over (Nørretranders, 1998, p. 303). I find such suggestions a bit problematic. According to the empirical data Nørretranders presents, one can easily suggest that all types of decisions are in fact done nonconsciously. Thus, there seems to be some inconsistency in the theory offered by Nørretranders.

It is not the point of this thesis to present a complete discussion of the phenomenon of consciousness. Rather, the point is to demonstrate the problematic distinction between consciousness and nonconsciousness. As previously indicated, it seems to be a general notion that reflection is a conscious process that contains the ability to change behavior and strategy, whereas nonconsciousness are associated with the automation of body functions as well as intuitive processes based on former experiences, not leaving room for change in a degree similar to
conscious processes. However, the above perspective questions such assumptions. What if conscious reflection is just a kind of rational explanation of actions initiated nonconsciously? Then, general notions of the phenomenon of reflection seem problematic.

6.6 Tracing intuition, body, and reflection

In the light of the first part of this chapter there seem to be a number of contradicting viewpoints and unanswered questions regarding the role of reflection, consciousness, intuition, and body. In the following, I will address these issues from an empirical angle through the discussion and analysis of a case selected from the third phase of the case studies.

6.6.1 Cecilie: a case study

Cecilie is 22 years old. Cecilie began playing the piano when she was seven years old. She attended classical piano lessons on a regular basis until she began high school. After a year playing classical music at high school she started playing rhythmic music, mainly jazz. She has focused on jazz ever since and has attended several jazz courses outside the high school context. Furthermore, she has sung in several choirs, within which the repertoire has been both classical and rhythmical. During high school she participated in a school project where she composed music to be played by the Oslo Philharmonic. The students received instructions in order to write for an orchestra. At the moment she listens to jazz, soul and pop music, Bill Evans, Esperanza Spalding, Thomas Dybdahl, Jarle Bernhoft. Besides, she also listens to classical music, for instance music including choirs, e.g. Faure’s requiem, or piano music, e.g. Debussy.

In the final interview with Cecilie, reflectivity, knowledge, and intuition become a central theme. On the one hand Cecilie was very explicit when it came to describing the musical theory and rules that apparently work as a kind of flexible guideline in the process of composition. On the other hand, she repeatedly stressed that in order to get ideas she has to abstain from thinking. Early in the interview, Cecilie describes how knowledge of music allows her to sense what might sound good, without having to think explicitly about it. Thus, her explanation seems to fit with the notion of expert behaviour suggested by Dreyfus and Dreyfus. In other words, she might have an extensive knowledge of music, based on experiences as well as rules that she applies intuitively in the process of composition. However, there still seem to be some ambiguities in terms of reflection and
intuition, which calls for further investigation. In the following, I will seek to explore this ambiguity (part of the interview and the process of composition can be watched on the following address, http://youtu.be/9tYKiLRA5LM)

Initially, Cecilie briefly described the process of composition as something that includes the body as well as some kind of disconnection of the brain. However, she still described the manifestation of some kind of explicit music-theoretical reasoning.

*I sat by the piano all the time. I had to do so because it’s like my instrument. And it was just after I had practised something else, and I just stayed there. It was a bit like a coincidence. I tried different stuff and found some chords that I liked. I had the time, so I brought in the equipment. And then...I sat down and played with sound and stuff. And because I had the key note – or the key harmonies – then the melody was kind of the result of improvisation. You hear something inside your head. And then you try not to think. Just do something. Almost like, let the fingers...just disconnect the brain.*

(Interview, 2014)

According to Cecilie, the disconnection of the brain is highly important in order to promote ideas. Equally it seems like the creative process is based upon some kind of tacit embodied knowledge. This is reinforced by the fact that Cecilie uses the piano, which she considers her main instrument in terms of musical expression. At other occasions in the interview she emphasized that the piano is like ‘her voice’ in music, indicating a certain embodied derived intimacy with this instrument. However, she explains that she occasionally hears something in her head, indicating that her fingers alone are not always the point of departure when a new idea is conceived. Furthermore, she refers to musical concepts and norms of tonality, indicating that norms or rules also play a specific role in the process of creation. Thus, concepts like ‘the intelligent hand’, ‘tacit knowledge’, etc. seem insufficient to describe the various integration and separation of mind and fingers. In other words, Cecilie’s explanation indicates that reflexivity and conscious deliberate thinking are intertwined with - as well as separated from - the body and the tacit knowledge.

When studying the video recordings, it seems clear that the connection between hand and mind vary throughout the process of composition. Thus, sometimes Cecilie listened to the music that she had
composed by the use of computer. In these situations, she often closed her eyes. On other occasions, she simply sat down with her eyes closed without listening to music (watch the movie on the following address, \url{http://youtu.be/9tYKtLRASLM}). In the interview she often referred to a kind of reflective moment. In these moments, the fingers are apparently not part of the process. On other occasions, she played at the piano, apparently improvising, presumably relaying on her fingers to do the job.

_Cecilie:_ And next it is ‘Listening’ as I wrote – that’s a stage, which is both – how to put it – technical – because you think chords, and this has to be a minor third, etc., and so on, but you just listen [she is closing her eyes], also trying not to think, but just listen for something, for instance counter-movements, if the melody goes up, I hear something going down, or answers or...something like that.

_Interviewer:_ When you say that, I think; it sounds as if some kind of musical thinking is lying behind, you know, something to do with musical counterpoint. When something goes up something goes down. But you describe it more like it is something that you sense. Previously, you have told me that you have a theoretical as well as an intuitive approach. And now you say that when something goes up and something goes down then it is based on intuition. Is it understood correctly?

_Cecilie:_ Yes, in some situations it is.

_Interviewer:_ Because to me it sounds like a musical...

_Cecilie:_ But of course it is. It might be a conscious thought. But when I listen, I try not to think, e.g. this melody is going up and then I have to find something that goes down, you know, du du du [Cecilie sings a descending figure]

_Interviewer:_ Okay, I understand...

_Interviewer:_ Can I ask you, Cecilie, why even think about the minor third? As I understand you, you would like to, say, put in a minor third in the bass or...you know, like that, right? Why do you need to think that? If you can just do it by intuition? Do you understand what I mean? What’s the point, even thinking about it?

_Cecilie:_ Well, to ensure the overall consistency... In order to...If I just played a lot of melodies going in different directions [she is pointing her fingers in different directions]. I must have the entire work [she holds her hands as she is holding a ball] – well the ‘entire work’, it is not that big [she is laughing].
Interviewer: I think I understand you, I am just trying to search a bit deeper. It sounds as if your intuition could manage to secure the wholeness in the piece. You know, when something goes up something might need to go down. So the question could be. In what way do you think the theoretical approach has contributed to the composition?

Cecilie: Well, the progression of the chords was there. But given that I newer recorded a complete chord. Then the chord is divided in different instruments. Accordingly, several instruments create the chord together. But at the same time it is not meant to be...I want the single instrument to move forward.

Interviewer: Okay – now I understand. When you think a melody you do it intuitively...you think, where does the melodic line lead me...?

Cecilie: Yes – compared to the other melodies

Interviewer: Yes – in relation to the other melodies, but if we for instance remember to include the minor third in the overall sound scape. It might be forgotten.

Cecilie: Yes – no [looking a bit hesitant]

Interviewer: So the risk is – I am only trying to understand it – I work intuitively with some melodies – they develop in different directions – they might move in a satisfying way in terms of each other. But in the end I might have forgotten to include the minor third.

Cecilie: Yes

Interviewer: This is where the theoretical approach...

Cecilie: [interrupting] But the minor third doesn’t have to be included if the music sounds good.

In the interview the interviewer, that is, me, might establish an unfortunate contrast between deliberate thinking and intuition. Anyway, it seems like Cecilie is somehow driven into some kind of dilemma. First of all, she holds that musical rules and norms do not determine or influence directly or consciously the creation of the music. Rather, the music is based on intuition that might of course, according to Cecilie, be based on explicit musical rules as well as musical experiences, but is not the result of rational thinking. However, she still emphasizes that explicit conscious knowledge helps coordinate the musical integration and consistency. In the interview I present this as a paradox. What is the point in applying rules explicitly, if the fingers or the ears can easily do the job without reflective interference?
Cecilie’s answers might be understood in various ways. First, knowing something is not necessarily the same as being determined or controlled or even guided by such knowledge. This seems to be the point that Cecilie makes when she stresses that knowledge about musical counterpoint might be ‘a conscious thought’ even though it is not the main reason for actually composing music that follows such rules. She repeats this, stressing that the fingers, the ears and the intuition form the dominant actors in the process of composition. The music doesn’t have to follow rules if it sounds good, ‘the minor third doesn’t have to be included if the music sounds good’. Thus, rules and norms might be part of the intuitive point of departure and therefore part of the ‘fingers that search’, the ‘ears that listens’, ‘the sudden melody in the head’ and simultaneously a declarative musical knowledge that she is familiar with on a reflective level.

Secondly, the explicit knowledge about musical norms might work as a kind of guide that somehow provides a path, a guide or a frame of reference. As I understand Cecilie, some stages of the composition process can only succeed if rational thinking is put aside, e.g. when she composes a melody. However, other processes might include rational thinking, e.g. when she is working with the musical accompaniment and structure, orchestrating the music in order to integrate the different instruments and melodic lines on a horizontal level while still building up harmonies on a vertical level. Thus, rules and norms might help coordinate musical elements but they are still not goals or criteria of success in themselves, and therefore it is legitimate to put them aside if it turns out that such norms are not needed in order to make the music sound good. Thirdly, it might be suggested that intuition is actually the primary actor and that Cecilie’s conscious reflections primarily works as a kind of post facto rationalization, maybe reinforced by the questions asked in the interview.

When examining the final composition, it seems likely that Cecilie, as she says, follows rules but not in a consistent manner. The musical form applied might be described as a repeated sequence, including eight bars comprised of the harmonies F, Am, Dm, C, Bb, Am, Gm, and C. Accordingly, the piece is clearly following common tonal traditions, equally reinforced by the descending bass-line, reflecting traditional norms in Baroque and Classical music (see e.g., Boyd, 1999). Now, what is interesting in terms of the above discussion is how Cecilie orchestrates the melodic material with respect to the constructed chords. In the interview, she stresses that on the one hand musical theory helps her to distribute the tones of every single chord among the different instruments, and on the
other hand such norms don’t matter if the music sounds good. In the following table, the harmonic material in the last part of the musical piece is presented in order to investigate this explanation.

<table>
<thead>
<tr>
<th>Bar number</th>
<th>25</th>
<th>26</th>
<th>27</th>
<th>28</th>
<th>29</th>
<th>30</th>
<th>31</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>The chord</td>
<td>F</td>
<td>Am</td>
<td>Dm</td>
<td>C</td>
<td>Bb</td>
<td>Am</td>
<td>Gm</td>
<td>C</td>
</tr>
<tr>
<td>Main notes in the bar</td>
<td>A</td>
<td>C</td>
<td>A</td>
<td>D</td>
<td>E</td>
<td>C</td>
<td>D</td>
<td>A</td>
</tr>
<tr>
<td>Descending figure</td>
<td>F</td>
<td>E</td>
<td>D</td>
<td>C</td>
<td>Bb</td>
<td>A</td>
<td>G</td>
<td>C</td>
</tr>
<tr>
<td>Lowest note</td>
<td>F</td>
<td>E</td>
<td>D</td>
<td>C</td>
<td>Bb</td>
<td>A</td>
<td>G</td>
<td>E</td>
</tr>
<tr>
<td>Number of instruments playing</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Model 6.1 The harmonic material in the last part of Cecilie’s musical piece

In the last six bars, four instruments are playing simultaneously. Accordingly, if the attempt is to build up traditional triad chords, then it should be possible. However, according to the table, Cecilie chooses momentarily not to follow strict rules in terms of harmonizing. For instance, in the beginning of bar number 28, Cecilie doubles the key note as well as the third, leaving the fifth aside. On the other hand, she consequently incorporates the third and the keynote, which are the two most fundamental notes with respect to harmonizing within this genre of music (see, e.g., Lauesen, 2002). In the interview, she also primarily mentions the third. Thus, it seems like Cecilie in general is following the rules that she sketches in the interview.

### 6.6.2 Christian: a case study

Cecilie argues very specifically that rules don’t matter if the music sounds good (see above). This point of view is essentially supported by the experienced musician Christian (from the third phase of the case studies). Yet, it seems like the rules are not easily ignored. In the music course, Christian
made a song based on a bass-riff. However, this bass-riff seemed to produce some structural problems, especially with regard to the chorus. Thus, it seemed like the chorus began in the middle of a bar instead of in the beginning. To me, this musical detail sounds great and original. In the evaluation groups the opinions were varied. However, Christian seemed to be struggling with different perspectives:

*Christian: It doesn’t fit perfect but is has to be like this. Because if you change it, then it will sound even more strange. Later when I started to make the lyrics I became more satisfied. I just reckon that I was influenced too much by rules and music-theory. That was the reason why I was not really satisfied. If you just listen, then it actually sounds good. Besides, there are a lot of other mistakes in the song.*

*Interviewer: Mistakes? What do you mean?*

*Christian: For example the chorus. Normally, you would divide a section in two, four, or eight. But this chorus is divided in three. Well, you don’t notice it. It works. It is not necessarily a bad thing. But when you know a song is not supposed to be built like this, it is somehow frustrating.* (interview, Christian, 2014)

In the video recording it is possible to follow the creation of the song from the emergence of the initial bass-riff to the creation of the chorus (watch the movie on [http://youtu.be/Fr-vjN20luI](http://youtu.be/Fr-vjN20luI)). Accordingly, it seems like the process is partly blind in the sense that Christian apparently was a bit confused about the metrics of the bass-riff. The riff was finished really fast in the process. However, after having composed the bass he changed the drums a bit and when he returned to the bass he had some problems finding the melody again. He managed to find it, but apparently there was something unclear about the metrics. It seemed like Christian was a bit confused as to where the riff actually began. Later on this seemed to have a deep impact on the composition process and the final outcome, first of all the metrics of the chorus (in the screenshot below it is possible to see how the chorus was divided into three parts instead of four or eight).
Naturally it is a question of interpretation whether or not this unusual musical detail sounds good or not. However, Christian seemed to be in an internal conflict. On the one hand, he held that the rules were unimportant. On the other hand, he seemingly found it uncomfortable to break the rules. Accordingly, it seems like declarative knowledge influences the process of creation rather explicitly after all.

Christians approach to music making might be related to his relatively limited amount of musical experience. Christian has played guitar for six years and he has worked with different types of computer software for four years. Besides, in the Gymnasium he chose to study music at the highest level (level A). Thus, even though Christian has substantial experience within the field of music, one might argue that he explicitly refer to declarative rules because he is still not an expert within the field of music. In other words, from the perspective of Dreyfus and Dreyfus, one might argue that he is at a stage of learning where he still needs to lean on declarative rules. Yet, the case of Christian exemplifies how declarative knowledge might limit the production of unexpected outcomes.

### 6.7 How to avoid an entrenched perspective

Based on the above discussions it seems like expertise might also inhibit new perspectives. In other words it seems reasonable to support the suggestion referred at the beginning of this chapter, ‘[t]he expert can become so entrenched in a point of view or a way of doing things that it becomes hard to see things differently’ (Sternberg, 1996, p. 347). However, this view is strongly criticized by K.A.
Ericsson, who states that, ‘the common belief that expert performance is fully automated is completely false’ (Ericsson, 1998, p. 90).

K. A. Ericsson is one of the main researchers within the field of expert performance and has for instance edited the book *The Road to Excellence* (1996) that includes chapters written by prominent researchers like Robert Sternberg and John Sloboda. He recognizes that practice in some cases might lead to an entrenched perspective, but holds that expert performance is the result of a process that deliberately avoids automated behavior. Thus, the main tool to avoid an entrenched perspective is ‘deliberate practice’ that includes some kind of reflective monitoring of the training and working process: ‘[T]he key challenge for aspiring expert performers is to avoid the arrested development associated with automaticity and to acquire cognitive skills to support continued learning and improvement’ (Ericsson, 1998, p. 90). Ericsson is not only connecting deliberate practice to expert performance, but also to creativity in general.

*Training does not stifle creativity but rather provides the tools and knowledge to empower the experts to be more successful and effective in their daily work and facilitate their search for innovative ideas, especially those rare ones that go beyond the current knowledge and practice.* (Ericsson, 1998, p. 95)

Accordingly, people that are able to perform ‘deliberate praxis’, might reach the level of expert performance. However, if ‘deliberate praxis’ is not applied, then an entrenched perspective, including automatic behavior, might be the consequence.

Ericsson is focused primarily on training and performance. For instance, one of his key examples is the violinist Paganini, who developed a new playing technique through a process of deliberate praxis (Ericsson, 1998, p. 95). However, this approach to training seems to be equally relevant with respect to other types of creative processes. In other words, deliberate praxis might also be relevant in regard to music-making and improvising. Thus, some composers might deliberately choose to compose in new ways in order to develop new ideas. According to Ericsson’s theory, that would partly explain why some composers are able to be creative while others are not.
Ericsson’s main project is to show that training is the most important element on the road to excellence rather than talent or some kind of mysterious connection to a source of inspiration. From a methodological point of view, his approach might be criticized for at least two reasons. First, Ericsson might have confounded correlation with causation. The fact that successful performers, inventors and artists have spent many hours in training does not necessarily mean that this is the key reason behind their success. Second, Ericsson is first and foremost preoccupied by the recognized successful performers. In other words, performers who have trained all their life without gaining any form of recognition are not part of Ericsson’s investigation. In other words, he does not include a form of control group in his study.

Nonetheless, I find Ericsson’s account interesting and fruitful in the sense that it seems to correspond to the working methods of recognized creative people. As mentioned in the very first chapter artists like Lars Von Trier and the members of R.E.M. all seems to develop new working methods in order to escape a potentially entrenched perspective or automatic behavior. The same trend is evident in the empirical material produced in this study. In the interview with Cæcilie Trier about her upcoming album (see previous chapter) she states: ‘This time I make the lyrics as the first thing. I have newer tried that before. The melodies become quite different’. Equaly, Sandra Boss describes how she intentionally promotes mistakes in order to facilitate new sounds and compositions. Similarly Louise Nipper describes how she participates in different workshops in order to try out new methods of composition. And in the below, the professional composer, Nicklas Schmidt, explains how he sometimes invents new ways of composing in order to escape from automated behavior and develop new ideas.

In order to get new ideas I often improvise on the piano. I let my fingers work. I try to find something with my fingers. I turn of my brain. However, sometimes the problem with improvisation is that you just produce the same kind of material over and over again. Therefore, I sometimes invent new ways of playing. For example, I cross my arms so I am playing with my right hand on the lower keys and on the left hand on the upper keys. Or, I decide that my left hand is only allowed to play on the black keys and the right hand is only allowed to play on the white keys. Or both hands have to play two
octaves simultaneously. I am not doing these kinds of experimentations to create strange music. I only want to search for new ideas. (Interview, Nicklas Schmidt, 2013)

6.8 Summing up

In this chapter, different approaches to expertise have been presented in order to understand the role of experience and knowledge in creative processes. In that respect, a number of key terms have been discussed, including reflection, intuition, consciousness, and embodiment. In the chapter I constructed a distinction between approaches that seemingly highlight the role of conscious reflection and approaches that emphasize the role of body and intuition. Further, I constructed a distinction between theories that reinforce a body-mind dichotomy and theories that try to put aside this dichotomy. Finally, I discussed how expertise can lead to an entrenched perspective and how such entrenched perspectives may be avoided.

In the chapter, empirical material was presented, and it was argued that neither the mind-body dichotomy nor the holistic approach to behaviour may be rejected, but rather combined. However, the discussed phenomena still represent paradoxical elements and seem difficult to comprehend and describe sufficiently. In Part Five these issues will be discussed further.
Chapter Seven: A social perspective on learning

7.1 Introduction

Dreyfus, Schön, Polanyi, Sennett, and Merlau-Ponty are primarily preoccupied by expertise from an individual point of departure. Thus, such thinkers and researchers have been criticised for ignoring the social perspective of learning (e.g., Andersen 2011, p. 23). In the following, I will seek to examine creativity and expertise from a sociological/social perspective. Primarily, the theory of ‘communities of practice’ will be the centre of the discussion. There are several reasons for this. First, the theory holds a key position within the field of learning. Second, Klaus Nielsen has done a very relevant investigation of the Royal Academy of Music based on the theory of communities of practice that seems to correspond to a number of issues addressed in this study. Besides, I have had the chance to discuss the theory of communities of practice with Etienne Wenger, one of the founders of the theory, which has given me a unique opportunity to explore the potential of this specific approach to expertise and creativity.

The chapter falls into two parts. First, the implications of communities of practice are discussed with respect to the reproduction and production of practises and norms. Next, identity and communities of practice are discussed with respect to the facilitation of creativity. Finally a case study is presented.

7.2 The theory of communities of practise

Apprenticeships and communities of practice are often considered quite conservative. In a seminar about innovation, held 30. January, 2013, the head of the research department at UCSJ, Niels Henrik Helms, stated that: ‘A pedagogical institution is a traditional community of practice. The point is that the novices have to learn how to imitate the expert. Thus, this very construction does not facilitate innovation’. Similarly, Martin Bayer describes how trainees move from a peripheral position to a centre position by imitating and overtaking the norms and behaviours of their masters.
A similar point is made by Schön, who emphasizes that apprenticeships might not leave room for reflection-in-action and thus hardly promotes changes (Schön, 1987, p. 37).

The summed up reservation seems reasonable considering the general and inherited understanding of apprenticeship. Traditionally, apprenticeship has been associated with rather stable processes taking place in rather stable communities within rather stable professions, e.g. the baking profession, the tailoring profession, and the carpentry profession. Of course, change and innovation are also part of the history of such professions. However, from a historical point of view, it is reasonable to suggest that a relatively high degree of stability has actually been the case in such professions over long periods of time (see e.g., Bishop, 2001).

7.2.1 An introduction to the theory
In a current learning-theoretical context, the concept of apprenticeship was efficiently relaunched by Etienne Wenger and Jean Lave. As their main point of departure, Wenger and Lave were critical towards the objectification and externalization of knowledge often implied in the field of learning studies (Lave & Wenger, 1991, p. 84; Wenger, 1998, p. 3). Wenger unfolds this argument by drawing attention to the library as a supposed ‘body of knowledge’, and argues that what is missing in this scenario is the humans and their practices (interview with Wenger, 2014). Accordingly, Wenger and Lave set out to study knowledge and learning as it appears in practice. Subsequently they chose tailoring apprenticeships in West-Africa as their main field of study.

As a result of their study of the tailoring community, Wenger and Lave suggested a new description and interpretation of apprenticeship. First, they found that apprentices quite often learned from other apprentices instead of the master, and that their process of learning might be more properly explained as a journey from a legitimate position to a central position in a working community. Accordingly, they considered the dual relationship between master and apprentice unsuitable to describe the complex networks of interaction taking place, and suggested that ‘community of practice’ might be a more suitable term. Secondly, they found that notions of apprenticeship as somewhat uncreative, non-reflective, homogeneous, and conservative were inadequate. Rather, such a form of informal learning was complex, inventive, heterogeneous, and multidimensional (Lave 1999, pp. 40-41).
7.2.2 Does communities of practice promote reproduction?

In spite of Lave and Wenger’s descriptions of communities of practise, the periphery metaphor might indicate that such communities contain a conservative element, in the sense that newcomers are not full participants before they have acquired certain skills (see e.g., Jespersen, 1999). However, Wenger and Lave emphasize that such an interpretation is misleading:

*Given the complex, differentiated nature of communities, it seems important not to reduce the end point of centripetal participation in a community of practice to a uniform or univocal ‘center’, or to linear notion of skill acquisition. There is no place in a community of practice designated ‘the periphery’, and, most emphatically, it has no single core or center.* (Lave & Wenger, 1991, p. 36)

As I read Lave and Wenger, their explanation of a social community seems a bit ambiguous in the sense that they reject the existence of a core or a center of the community but still imply the existence of a volume of skills and knowledge that have to be learned. In a conversation with Etienne Wenger at Campus Slagelse on May 6, 2013, I had the chance to discuss the issue further. As the point of departure, Wenger applied a metaphor of landscape in order to explain issues of learning: the (learning-)landscape consists of hills, mountains, valleys, fields, etc. A hill represents a community of practice. If you want to be part of the community of practice, you have to climb the hill. In other words, you have to engage in the community, participate, and learn, and eventually you might approach the top of the hill. Some types of communities of practice might be very elitist, e.g. when only few experts actually are able to engage properly in the community and it takes many years of hard work to acquire a central position. Such communities may rather be described in metaphorical terms as an extremely high and pointed mountain, almost like a needle. According to Wenger, such members of the community might stand on the top of the needle looking down on all the potential newcomers, and with a ‘satisfied grin on their face inviting the newcomers to try to climb the hill’ (interview with Wenger, 2014). On the contrary, some communities of practice do not demand elitist competences. Such communities may be depicted as flat hills. It is important, though, that the landscape is understood as changeable. The communities of practice are transformative, although they represent some kind of ‘historical resistance’ (interview with Wenger, 2014). In other words, small hills can be built upon other hills, hills can vanish, etc.
The metaphor of landscape appears reasonable. However, it seems to be slightly in conflict with Wenger and Laves’ suggestion that a community of practice is without a specific center and without a specific measurable domain of knowledge that must be acquired. It seems reasonable to ask, why a hill is applied as a metaphor for something without some kind of a center? Or why is the term ‘peripheral’ applied if there is no such thing as a periphery? Lave and Wenger actually address these questions rather thoroughly, but the explanation seems somehow insufficient in the sense that it remains unclear why the term peripheral is applied and why it is not possible to imagine some kind of core knowledge that has to be acquired (Lave & Wenger, 1991, pp. 34-37).

The implied internal inconsistencies in the theory of communities of practice are also addressed by Ejgil Jespersen (1999, pp.171-175). Jespersen’s main argument is that Lave and Wenger neglect the fact that many newcomers actually learn from observing, imitating and being taught by old-timers. With references to interviews with amateur gymnasts, he demonstrates that novices acquire certain skills through some kind of imitation of the experts. Accordingly, he argues that a certain type of hierarchy exists. Further, he suggests that Lave and Wenger downplay the potentially asymmetrical relation between novices and experts, simply because they are eager – on a normative level - to preserve the newcomer’s right and ability to negotiate meaning (Jespersen, 1999, pp.172 – see also Lave & Wenger, 1991, p. 51).

7.2.3 Why communities of practice are not conservative?

As implied in the above, Lave and Wenger stress that communities of practice do not lead to reproduction. Still, as implied, the model of learning seems to contain conservative and reproductive elements. Further, apprenticeship is frequently associated with a bodily-derived form of imitation that leaves minimal room for negotiation and reflection (Nielsen, 1999, pp. 161, 214). Thus, for various reasons it seems essential to ask the question appropriately formulated by Klaus Nielsen: ‘We are all part of communities of practice, but why do we not become ‘the same’ so to speak. How do we maintain a social perspective and still address issues of human differences?’ (Nielsen, 1999, p. 40).

Klaus Nielsen adopts the notion of ‘trajectories of practice’ to answer this fundamental question. The term was initially suggested by Jean Lave (1996), and is further developed by Nielsen among others. Nielsen defines the terms as ‘how the individual changes his participation in a particular
historical practice’ (1999, p. 56). Accordingly, ‘rather than focusing on the teacher’s, the master’s or the institute’s influence, the perspectives of a trajectory focus on how the learner uses, connects or disconnects his or her participation in a social practice’ (Nielsen, 1999, p. 56). Nielsen applies the concept in his analytical strategy and demonstrates how students at the Academy follow very different paths. In other words, the students may participate in many different communities of practice and might participate in very idiosyncratic ways. Thus, Nielsen can finally conclude that ‘…we do not all become ‘the same’ - due to the student’s personal histories, the different modes of participation in communities of practice and the ways of combining the participation at the Academy of Music with modes of participation in other communities of practice (Nielsen, 1999, p. 97).

Another key point regarding questions of reproduction is the role of the master and the apprentice. It may be suggested that an apprentice who only relies on one master ends up recreating instead of creating (Dreyfus & Dreyfus, 1999, p. 70). In reply, it is stressed that an apprentice typically learns from several masters and thereby combines inspirations and inputs in an idiosyncratic way (Dreyfus & Dreyfus 1999, p. 70; Jespersen, 1999). Furthermore, it is assumed that imitation might not be understood as a transmission but rather a kind of a transformation where the novice builds up meaning based on the interactions with the more experienced (Schön, 1987, p. 108; Nielsen, 1999, p. 154). Thus, it is claimed that imitation doesn’t lead to reproduction.

7.3 Participation and identity

One of the main points in the theory of Wenger and Lave is that learning is connected to identity. In other words, by participating in communities of practice you become another person. In the following, the aim is to explore how this changed identity might influence creative performance.

7.3.1 To change identity

In the investigation of the Academy of Music, Klaus Nielsen describes in detail different students’ trajectories of participation (1999). In general, he identifies two different categories that seem to be dominant in regard to how the students see themselves and behave at the Academy. The first category contains students with ambitions of becoming concert instrumentalists. The second category contains students who want to become music teachers. According to Nielsen’s
investigation, becoming a concert pianist is valued more highly than becoming a music teacher (Nielsen, 1999, pp. 62-63). To become a concert pianist is only possible for a limited group of students. Thus, many students hope and believe that they will become concert instrumentalists but end up as music teachers. Such trajectories of participation are described in detail partly through the investigation of the wunderkind, Grethe, who ends up as a music teacher.

*Grethe felt that she was being evaluated by the critical audience and had a hard time accepting the life form and values of the prevailing culture. Grethe was ready to give up the Academy, but succeeded in finding other ways as a musician. She began to work as a music teacher which gave her great satisfaction [...]*. (Nielsen, 1999, p. 96)

According to Nielsen’s interview with Grethe, the other students at the Academy played a key role in terms of the trajectory Grethe chose to follow. Grethe did not feel supported and praised as a concert pianist by her fellow students. Eventually, she gave up her ambitions of becoming a concert pianist.

The story about the Academy of Music mirrors my own experiences, described in Chapter One. Further, the story mirrors the content of the interview with students and former students of the Royal Academy of Music carried out in this study. (e.g., interview with Mette Lind Lauritsen, 2013). First of all, it seems like a general assumption that being a concert instrumentalist is considered the most valuable outcome of learning there. Secondly, it seems like the negotiation of who deserves a place among this privileged group is very visible. Therefore, people very clearly feel that they don’t fit in, if they are not supported or encouraged by their peers.

This perspective is quite relevant in regard to this study for several reasons. First, it seems like students’ ambitions of being outstanding, so to speak, are levelled down because of the social judgement which takes place in the community of practice. From a creativity perspective, you might question such a judgement in the sense that the students’ potentials would perhaps have been judged differently in another community (see Chapter Two). In other words, it might be possible that such students would be considered outstanding in another context. Second, the courage to perform and create might be very dependent on the level of support in the community. Therefore, the judgement and negotiation in the communities of practice might in some cases inhibit individual’s outstanding
qualities and their ambitions in terms of being creative. Such a mechanism might be the case in the following example from the third phase of the case studies.

7.3.2 Henrik: a case study

Henrik is 25 years old. He started playing the piano at the age of 11. He received formal training the following four years. He began playing drums and guitar at the age of 14. At the age of 11 he began making music though the use of musical software, firstly Ejay. During the following years he worked primarily with Fruity Loops. Finally, he began working with Reason. Henrik has been making music through the use of musical software for at least eight years. He has been active in the online music communities Myspace and Bandbase. Some of Henrik’s music has been played on the radio.

Although Henrik is not part of a formalized community of practice, for instance an institution for education in music, he often referred to different communities and how participation in these communities had affected him. When he started to play the drum and the guitar he was partly trained by his big brother’s friends. When he started listening to heavy metal, it was because he was introduced to this genre by his new classmates at the Academy of Sorø. When he started composing music he was active on different online platforms, interacting with peers. This comes as no surprise. The question is how he describes these communities according to his own artistic development and performance.

*Interviewer: When did you start making computermusic?*

*Henrik: Ejay, when I was 11. Where you got all the preproduced melodies. You know it, right? Moving around with boxes. What sounds good. I started with that. And my classmates...I used Ejay until the seventh or eighth grade... And my classmates they were like ‘Wow, that’s amazing’. Then it became a sport. I began to DJ and so on. And then I thought ‘okay’, and then I became a bit more serious. Then, I downloaded something called Fruity Loops. A very simple program compared to Reason. I worked with that until the age of 16 or 17. Three years I guess. Then I was told...I was a part of Myspace – the same as Bandbase today...I hooked up with a lot of people there. There were communities where you wrote to each other and you talked about each other’s music and what was good and what was not good and so on. And there was someone*
who told me that 'you have to download Reason because the sound is much better', and it was. Fruity Loops is amateurish compared to Reason. And then I was a bit like ‘aarhg...it’s a bit tough’. Because I couldn’t do anything with Reason. I mean, just to get started. I think I spent half a year on that. And then I started to master it and then I began to produce reasonable music.

Interviewer: That is actually a rather long period of time...

Henrik: Yes, and it’s the same with Fruity Loops. It also took me half a year to learn how to use it properly. Conversely, Ejay, everybody can work with that. It’s all about trying and listening. And it’s about putting up boxes. And then Fruity Loops, it’s about making your own melodies. Like Reason. Fruity Loops is just more amateurish.

Mikkel: What do you mean, amateurish?

Henrik: The sounds are tacky and the number of sounds is not that comprehensive. With Reason, you can do everything. I still haven’t mastered the program. I can walk around in it. I know where the stuff is placed. But when I look at the net and meet people who really know how to use the program, I just sit down and think ‘yes, they are much better than me. They have spent much more time on it’. I have been working with Reason for five years now approximately.

From my perspective Henrik’s story is significant for several reasons. First, even though he does not participate in a formal community, the descriptions of the online communities seem to mirror traditional education in the sense that, (1) Henrik’s music and talents are frequently being judged, (2,) he is introduced to new methods by more experienced musicians, and (3) there seems to be a rather clear distinction between novices and experts. Secondly, Henrik is constantly referring to questions of hierarchy and authority. Finally, Henrik is placing himself in a peripheral position compared to the experts in the field.

Accordingly, Henrik’s story seems to mirror Nielsen’s descriptions of trajectories of participation presented in the above: seemingly, Henrik’s participation in the online community entails a devaluation of his own competence. Thus, instead of highlighting his own qualities, he repeatedly emphasizes how the more competent composers are capable of doing things that he is not. This is for example the case when Henrik described how he comes up with musical ideas: ‘People who are
really competent, they can just put in sounds and notes and they will know exactly how it will sound. I am not nearly that good. I have to try it out.’

Henrik’s notion of how the experts work creatively might in some cases be right and in some cases be wrong (see Chapter Five and Chapter Six). Nevertheless, it is interesting that he devalues his own level of competence and his own accomplishments in a way that seems to limit his ambitions in terms of producing something extraordinary. Needless to say, you might argue that Henrik is simply not sufficiently talented or competent. Still, it seems clear that communities of practise might ultimately reinforce or limit participant’s motivation and abilities for creative work.

The interview with Henrik might also be interesting for a fourth reason. In the quote, Henrik emphasizes that producing valuable music is first and foremost a question of learning how to use the software. According to Henrik, the computer does not represent a shortcut to creativity but have to be learned like an instrument. Of cause, a half year of training is still a short period of time compared to the years you have to invest in order to learn how to play a traditional instrument. Nevertheless, Henrik’s description seems to question utopic notions of technology as a direct shortcut to musical expression. I will look more closely into this topic in the following chapters.

7.4 Summing up

In this chapter, learning, expertise, and creativity are addressed from a social perspective. The focus of the investigation has been the theory of communities of practise and the different implications of apprentiship. First of all, the key question addressed is whether communities of practice might lead to reproduction rather than production. In this chapter different perspectives have been presented and discussed. First of all, it has been emphasized that questions of production-reproduction depend on the specific community and the individual’s trajectory of practice. In that respect, it is argued that the theory of communities of practice might in some cases explain how learning might inhibit creativity. Equally, it is argued that the theories presented, including the theory of trajectories of practice, might explain why communities of practise promote creativity. Finally, a case study has been presented in order to demonstrate how notions of hierarchy may influence the creator’s identity and approaches to music-making.
Part Four: Creativity, expertise and technology
Chapter Eight: Combinatorial creativity and new aesthetics

8.1 The story about Mozart and the three young men

Above we see two pictures of young men in different settings making music. To the left we see Mozart next to his piano. To the right we see three young contemporary men surrounded by digital studio equipment. Imagine that the three boys are working on a musical piece. They want to make some kind of dance music. They boot up the computer, launch the music programme Logic and start searching for different drum loops. They find a loop that they like and continue to search for different types of loops. They choose a bass and some horns. It sounds great in combination with the chosen drum loop. One of them improvises on the MIDI keyboard. They cut up the recording and add a reverb effect so that the original sound is changed completely. They throw in some breaks, and a variety of other sounds. Finally they mix it down and distribute it to some local DJs. In the evening the DJs blend the music into the chosen playlist. The audience like the music and dance to it with great joy, performing all kinds of dance moves.

If we assume that the above scenario somehow represents creativity, the question might be; who is creative? Is it the drummer who played the original loop? Is it the producer who cut up the recorded drum in a specific way? Is it the producers of Logic who enable this type of music production? Is it the DJ who blends the music in a specific way? Is it the dancers? Or is it the three young guys combining different pre-recorded loops. Who is really the centre of creativity in this case? The
answer might be full of contradictions. On the one hand, the three young men are intentionally creating something and must accordingly be credited for playing a vital role in this process. On the other hand, it is reasonable to conclude that a process like this depends explicitly on many different events and actors, including the material such as computer, software, keyboards, etc. Thus, it might be more appropriate to talk about a network within which creativity is distributed among human and non-human actors.

According to the above, it might be suggested that such a creative process first of all is related to historical environments filled with digital hardware and software. On the other hand, Mozart’s processes of creation might equally be understood as distributed: Mozart used his piano as part of the process of composition. The piano is not a neutral tool. The piano enables the production of certain types of melodies, harmonies, etc. He wrote down the music using a notation system, which permits a certain type of music and excludes other types of music, for instance music not measured in time. Additionally, he was of course influenced by colleges, musicians, other people’s work and more. Accordingly, what is usually recognized as the unmistakable work of Mozart might rather be understood as creativity distributed in a network of human and non-human actors. However, this might also be a too simplistic conclusion, in the sense that creativity unfolded in a modern technological setting probably still differs from previous forms of creativity in significant ways.

This is one of the challenges with regard to the discussion about technology and creativity. On the one hand it seems reasonable to suggest that creativity within a technological setting actually differs from previous forms of creativity. In that respect the discussion is primarily an ontological one. On the other hand, one might argue that technological settings make visible specific elements of the creative process. Accordingly, the study of creativity and technology enhances a specific understanding of creativity that changes our general interpretation of creativity on a generic level. In that respect, the core of the discussion is primarily epistemological.

The balance between these two levels of approach resembles the discussion of hypertext, intertextuality, and digitally-derived forms of reading and writing. On the one hand, intertextuality is a theory about how a text must be fundamentally understood as a ‘multi-dimensional space’ and ‘a fabric of quotations, resulting from a thousand sources of culture’ (Barthes, 1986, p. 52). Accordingly, digital technology might illuminate parts of the processes of creation associated with
intertextuality, but do not cause this intertextuality (Landow, 1992, p. 72). On the other hand, it may be argued that digitally derived forms of hypertext reinforce the level of multi-dimensionality (Lanestedt, 1994). Hence, the discussion is twofold. First, it is a question of how to understand the construction and reading of a text in general. Second, it is a question of whether digitally-derived texts might differ from previous forms through an enhancement of specific characteristics (see also Dyndahl, 2002, pp. 208-210). In other words, general notions of the text as phenomenon seem to melt with attempts to identify the specificities of digitally-derived hypertexts.

In the following the attempt is to avoid unintentional confusion of the outlined approaches. However, both perspectives must be present in the sense that an investigation of creativity within a technological context naturally involves a discussion of previous forms of creativity as well as creativity in general. In other words, assumptions about ‘digital creativity’ become a double proposition, in the sense that suggestions about a specific form of creativity taking place in a technological context, equally involve implicit or explicit assumptions about a presumed form of creativity unfolding in a context without the use of digital technology.

8.2 An ontological perspective: Is this a new form of creativity?

While previously the great text of culture from which the artist created her own unique ‘tissue of quotations’ was bubbling and shimmering somewhere below consciousness, now it has become externalized (and greatly reduced in the process) – 2-D objects, 3-D models, textures, transitions, effects available as soon as the artist turns on the computer […] One does not have to add any original writing; it is enough to select from what already exist. Put differently, now anybody can become a creator by simply providing a new menu, that is, by making a new selection from the total corpus available. (Manovich, 2001, p. 127)

The chosen quote is picked out from the famous book The Language of New Media by Lev Manovich. In many ways the quote represents general notions about digital technology. Firstly, Manovich suggests that technology enables and facilitates certain types of processes, including
copy-paste procedures, searching and selecting, combinatorial creativity, the connecting to globalised databases, etc. Secondly, he suggests that these new procedures generate a new type of aesthetics characterised by a lack of original creation. Thirdly, he suggests that traditional forms of skills and training are no longer necessary. Fourthly, he suggests that a certain kind of operation typical for creative processes has now become externalized.

The first suggestion is relatively harmless and appropriate in the sense that it corresponds to present empirical studies of technology and creativity (Sørensen, 2002; Field, 2007; Pennycook, 2011). Nevertheless, it is important to note that Manovich might be dealing with a specific kind of aesthetics not necessarily applicable to all kind of digitally derived processes, e.g. algorithm-based musical composition (Breinbjerg, 2006, pp. 28-29). The second suggestion might intuitively appear appropriate in the sense that most empirical studies show how pre-produced materials are combined and result in new outcomes. However, the notion that this type of work is somehow less original might conflict with general notions of creativity, in the sense that the very combination of well-known material seems to be a fundamental part of creativity theory (see Chapter Five). The third suggestion is somehow unclear, in the sense that Manovich seems to be a bit critical of the quality of the processes and the products, when no skills are present. In other words, Manovich is addressing the question of whether or not this is a truly legitimate way of being creative. The fourth notion is extremely radical if the suggestion is understood literally. Manovich is obviously adopting a specific notion about the nature of creativity in general as something to do with combinations of ‘quotations’. According to Manovich, this combination is now done externally through the use of digital software rather than internally through the use of the creator’s mind and memory. I find the suggestion that internal psychological invisible processes have been exchanged with external visible processes quite interesting but also quite radical.

The four outlined issues are essential in terms of the investment of creativity and technology and will be pursued and discussed in the following chapters. In this chapter I will primarily discuss new forms of digital aesthetics and how they are related to notions of creativity. In chapter nine, I will discuss the role of expertise in a digital setting.
8.3 Interfaces and its implications for composition

In the article ‘Musikken interfaces’ [The Interfaces of Music] Breinbjerg explains how interfaces are built upon existing models and paradigms (Breinbjerg, 2006). In other words, interfaces are not neutral but represent a specific historical inherited understanding of music and music-making (see also, Knakkergaard, 1994; Bolter & Grusin, 2002; Dyndahl, 2002). Accordingly, Breinbjerg is adopting an approach similar to Latour’s actor-network theory and the theory of mediation, in the sense that non-human actors are included as important parts of the process of creation.

The historical inherited understanding of music is implemented in the software by the adoption of specific references to former media, e.g. drum machines, effect machines etc. Breinbjerg draws a distinction between two types of musical software, which reflect different musical paradigms, the sequencer paradigm and the synthesiser paradigm. The first paradigm is built upon principles inherited from multi-track recording machines, records, and turntables. Pieces of software like Logic, Cubase, and GarageBand may be seen as representing this paradigm. The editor-window of this type of musical software is built as a sequencer. The samples are placed vertically, looking like cut-up pieces of tape. You can push buttons similar to a multi-track recorder, e.g. ‘play’, ‘stop’, and ‘record’. You can cut the regions like you can do with scissors when cutting a tape. The parallels between the software and the multi-track recording machines are substantial. The synthesiser paradigm, on the other hand, reflects the traditional synthesiser through the sounds which may be modulated by the use of different algorithms, also known as filters (i.e., algorithmically generated music). Accordingly, this paradigm is closely connected to mathematical principles. Hence, in software like Music V and MaxMSP the user creates music by determining different mathematical values like frequency, volume, waveform, and phase (see also, Gertzo, 1992; Bravo, 2013).

Breinbjerg argues that the two different paradigms are related to and result in different aesthetical principles and working processes. The sequencer paradigm is primarily connected to the principle of selection and composition. The creator selects different samples and combines them in different ways. Thus, this type of software is closely related to what Manovich describe as ‘the language of new media’. As opposed to making something from scratch, the creator composites existing material. Within the field of music this software facilitates operations that seems to be connected to avant-garde musical principles, e.g. presented by Pierre Schaeffer, Steve Reich, and John Cage, in the sense that cut-up technics and montage are widely used in this tradition (Dyndahl, 2002, pp. 28-31).
However, the musical approach is equally widespread within popular music such as techno, dance and electronica (Negsus, 1993; Jensen, 2001; Marstal & Jaeger, 2003; Smith, 2013). The synthesiser paradigm, on the other hand, promotes a type of creation through which sound and music is produced more or less from scratch. The historical heritage of this type of approach to sound and music composition includes the pioneering synthesiser-constructors and composers in the fifties, sixties, and seventies, as well as the sound laboratories in universities of the same period (Marstall & Moos, 2001). According to Breinbjerg the creators within this paradigm are ‘both instrument builders, musicians and composers’ (Breinbjerg, 2006, p.39). In other words, Breinbjerg is adopting the notion that such music is composed from scratch.  

![Model 8.1](image)

In the pictures above the difference between the GarageBand interface (upper left) and the MaxMSP interface (upper right) are quite obvious. The GarageBand interface includes pictures that represent past and present hardware technology, in this case an amplifier (left column).

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5 The notion that something can be made from scratch is problematic in the sense that creativity essentially might be understood as a novel combination of well-known elements (see Chapter Five). In Appendix L this issue is discussed further.
Furthermore, bits of sound are placed on every single track resembling a tape recorder (left column). On the contrary, the MaxMSP interface is full of changeable numbers and lines that connect different components. The interface primarily resembles synthesiser diagrams, computer diagrams, and the internal parts of a computer (right column). Accordingly, the interface may be associated with digital programming, computer science, etc. Furthermore, the interface may also generate the notion that something can be made ‘from scratch’ in the sense that the creator apparently can manipulate and control basic components and basic connections in order to create sound.

### 8.4 The sequencer paradigm

The sequencer paradigm forms the point of departure in this dissertation in the sense that GarageBand is used as the main software technology. According to Breinbjerg this paradigm is characterised by four main principles, all reinforcing the associations to previous forms of media.

First, the clear separation of control and data: in the interface you are able to see the data that represents the sound and you can control this data, change it, play it, turn it around, etc. Thus it resembles a glockenspiel, an instrument at least 800 years old (Roads, 1996, p. 662). Second, the repetition as a general structuring principle: in most sequencer-software the opportunity to do repetitions is highlighted, for example, through the application of loops. Of course, the principle of repetition is well-known in music in general. However, Breinbjerg further argues that the principle of repetition is also related to historical technical matters in the sense that the analog synthesiser had limited memory, which meant that looping principles were necessary (Breinbjerg, 2006, p. 23).

Third, the presentation of media objects as discrete elements that you can move around: in other words, sound is an object that you can see, touch, carry around etc., like a piece of tape or a record.

Fourth, organization of sound through time and synchronisation: in sequencer software the music is on a detail level structured in time. Thus, it resembles the notation system. Breinbjerg is arguing that historical examples indicate that synchronisation tools are related to specific types of music, in the sense that the introduction of the notation system meant that complex polyphony was now possible. Equally the introduction of digitally based synchronisation means that many hundreds of musical layers can be controlled and synchronised in a very precise matter. Breinbjerg argues that such new possibilities result in new music where they are explored (Breinbjerg, 2006, p. 25).
The outlined affinities between a sequencer and previous technology seems obvious, especially from an actor-network point of view, in the sense that the important role of non-human actors is stressed. In the following, I will elaborate further on this interconnection between technology, history, musical genres, and human agency.

8.5 **New musical practices and genres**

From the perspective of ANT, different practices of music-making are related to technological innovation in various ways. In other words, musical software, technology, musical practices, and musical forms are intertwined in complex networks. In the following section, the point is to exemplify connections between the GarageBand interface, different types of music-making, and musical genre. Most importantly, I will describe a number of aesthetic principles that are connected to the principle of looping, because this feature seems to have an essential impact on the creative work in the case studies. However, most sequencer software is comprised of several platforms that might represent different musical traditions and aesthetic principles (see Chapter Nine). Accordingly, although the loop section appears to be a central feature in GarageBand, one may choose to work on other platforms whilst still using the software.

In the following I choose to focus primarily on rap music. Naturally, the musical principle of looping and sampling is also connected to other genres and traditions, e.g. musique concrète and aleatoric music (Dyndahl, 2002, pp. 28-29). However, rap music represents one of the most widespread and influential musical traditions in the western world (Krims, 2000, pp. 1-2) Thus, this genre is chosen as an example in order to exemplify specific connections between musical traditions and the GarageBand interface.

8.5.1 **The sample-technology**

The emergence of hip hop and rap music is one of the main historical precursors to the sample technology and practices we know today. The first phases of the genre are well described by David Toop (1984/2000), Tricia Rose (1994), Dick Hebdige (1987), and Keys (1996) among others. According to these writers, the appearance of the DJ in New York/Bronx in the early seventies represents a key point in the history of rap music and in the history of music in general. Toop, basing his narratives on comprehensive interview material, highlights three DJs who dominated this
initial development of the musical style and technique, Afrika Bambaataa, Kool DJ Herc, and Grandmaster Flash. Kool DJ Herc is presented as the inventor of the breakbeat technique. Grandmaster Flash is described as the developer of many DJ tricks and innovations. Finally, Bambaataa is primarily depicted as a master when it comes to blending all kinds of different musical styles.

Breakbeats designates a technique where a piece of music, usually a one-bar drum beat, is repeated in an unlimited way. In the initial phase, breakbeats are mainly conducted with two separate turntables. However, through the invention of sample technology, this technique was subsequently elaborated in the sense that the single breakbeat was supplemented by other layers of breakbeats, eventually producing a rather complex musical texture. These different layers might contain very diverse musical material; one layer might consist of a repeated sample of a piece of music containing horns, drums, and bass; another layer might consist of a repeated sample of a siren; a third layer might consist of a repeated one-bar sample of a piece of a drum solo; etc. Eventually, the word ‘breakbeat’ was partly substituted with the word ‘loop’ or ‘sample’, which makes sense, because the ‘breakbeat’ now contains many different types of musical material, not only beats.

In the history of rap music, the employment of samples has developed in diverse directions. However, it is possible to outline some sort of general trends, at least from the seventies and up to the early nineties. Firstly, the degree of complexity evolved, meaning that the number and diversity of samples playing simultaneously increased. According to writers such as Rose (1994), Keyes (1996), Walser (1995), and Krims (2000) this lead to musical polyrhythms and a thick and complex musical texture. Artist like Public Enemy and Ice Cube are in general highlighted as pioneers within this tradition.

One of the most dense and cacophonous raps to date, ‘Night of the Living Baseheads’ [Public Enemy 1988], used nearly forty-five different samples in addition to the basic rhythmic rhythm tracks. (Rose 1994, p. 80)

Next, the genre introduced a new way of mixing different musical styles. This comprehensive mishmash may, according to some writers, primarily be understood as plain eclecticism, whereas other writers emphasises the specific Afro-American heritage inherent in the choice of samples (see Appendix P). Thirdly, the sample-technology was used to implement sound effects, references to
movies, samples from political speeches, etc. This style is often referred to as documentarism (Boysen, 2002, p. 72). Fourth, the combination of different layers often results in atonality and bitonality. Finally, the structure of rap music is often relatively repetitive (Walser, 1995; Keyes, 1996; Krims, 2002). Accordingly, rap music is frequently constructed as a comprehensive amount of repetitions of the same bar rather than longer and hierarchical organized sequences consisting of harmonic shifts, melodic development, and refrain and verses (Walser, 1995; Keyes, 1996; Krims, 2002, pp. 97-122; Boysen, 2002, pp 75-85). Thus, the musical form in rap music departs from the musical form in other types of popular music that is often described as sectional and includes forms such as the strophic form, the thirty-two-bar form, the verse-chorus form, and the twelve bar blues form (see also Middleton, 1990, pp 64-93; Jensen, 2001; Marstal & Jaeger, 2003; Caplins, 2009, pp. 25-30).

8.5.2 The GarageBand interface interrelation to traditions within the field of rap music

Basically, the loop section in GarageBand and similar software promotes musical structuring principles also found in rap music. However, on certain points these musical principles are supplied or changed. First of all, the loop-section naturally promotes the incorporation of loops. The loops consist of single instruments, e.g. drums, as well as recordings of several instruments playing together. Thus, the loops within GarageBand resemble the loops found in rap music. Normally, the loops are quite short; one or two bars long. Yet, some loops are four bars long, six bars long, eight bars long or even sixteen bars long. The relatively comprehensive loops promote a sectional rather than a repetitive musical structure. Further, the many loops are indexed according to genre. Accordingly, the user might or might not decide to mix different genres.

Besides the characteristics sketched in the above, the GarageBand interface is in various ways both related and not related to specific traditions within the history of rap music. In the following table, the loop section in GarageBand is compared to the principles outlined in the previous section.
Table 8.1 The loop section in GarageBand

<table>
<thead>
<tr>
<th>Structuring principles related to rap music</th>
<th>Departure from structuring principles typical for rap music</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Loops</strong></td>
<td></td>
</tr>
<tr>
<td>One bar loops comprised of single</td>
<td>Four bar loops, eight bar loops, sixteen bar loops</td>
</tr>
<tr>
<td>instruments or ensembles.</td>
<td>containing harmonic shifts.</td>
</tr>
<tr>
<td><strong>Layering</strong></td>
<td></td>
</tr>
<tr>
<td>The editor window is structured in different layers placed underneath each other promoting a layering structure.</td>
<td></td>
</tr>
<tr>
<td><strong>Repetitive structure</strong></td>
<td></td>
</tr>
<tr>
<td>One bar loops that promote a repetitive</td>
<td>Longer loops promoting a sectional structure.</td>
</tr>
<tr>
<td>structure. Furthermore, a device in the editor window makes it very easy to produce a section with a repetition of the same loop.</td>
<td></td>
</tr>
<tr>
<td><strong>Vertical focus</strong></td>
<td></td>
</tr>
<tr>
<td>Short loops promoting a vertical focus</td>
<td>Longer loops promoting a horizontal focus.</td>
</tr>
<tr>
<td></td>
<td>Groups of loops with a single instrument or an ensemble that contains variation, e.g. different melodic lines, drum fills etc.</td>
</tr>
<tr>
<td><strong>Mix of genre</strong></td>
<td></td>
</tr>
<tr>
<td>The various genres represented promotes a mix of genres.</td>
<td>The many loops belonging to specific genres promote the production of music belonging to a specific genre.</td>
</tr>
<tr>
<td><strong>Affirmation of heritage</strong></td>
<td></td>
</tr>
<tr>
<td>The prefabricated loops make it difficult to use loops in a specific affirmation of heritage.</td>
<td></td>
</tr>
<tr>
<td><strong>Dense musical texture</strong></td>
<td></td>
</tr>
<tr>
<td>The possibility to combine many loops</td>
<td>The many loops containing only single instruments promote a musical texture similar to music played by traditional instruments.</td>
</tr>
<tr>
<td>comprised of many instruments promotes a dense musical texture.</td>
<td></td>
</tr>
<tr>
<td><strong>Polyrhythmic</strong></td>
<td></td>
</tr>
<tr>
<td>A number of features prevent the production of polyrhythm. The loops match each other in a conventional way. Furthermore, the default version includes a rhythmical net that helps the user to place the loops according to the timeline.</td>
<td></td>
</tr>
<tr>
<td><strong>Atonality</strong></td>
<td></td>
</tr>
<tr>
<td>A number of features prevent the production of atonality.</td>
<td></td>
</tr>
<tr>
<td><strong>Documentary</strong></td>
<td></td>
</tr>
<tr>
<td>Loops comprised of sound-effects – for instance, laughter, claps.</td>
<td></td>
</tr>
</tbody>
</table>

To sum up: GarageBand is related to and promotes a certain type of creativity and aesthetic. On the one hand the loop section in GarageBand promotes musical complexity, a dense musical texture, combination of different genres, and a repetitive musical structure. On the other hand, GarageBand may also be used to create music that is characterised by a sectional structure, homogeneity in terms of genre, and a transparent musical texture. Further, the GarageBand interface inhibits to a certain degree atonality and polyrhythm. I will return to this issue in Chapter Nine.
8.6 The GarageBand interface and notions of creativity

In the above, I have tried to exemplify how the GarageBand interface is related to specific technology, musical traditions, and aesthetics. In the following, I will discuss, how musical software is seemingly related to different notions of creativity.

According to Koestler, creativity might be described as a novel combination of ‘previously unrelated dimensions of experience’, that is, what Koestler understands as ‘bisociation’ (see Chapter Five). Accordingly, there seems to be an obvious similarity or affinity between musical software (and digital literacies in general) and the notion of bisociation, in the sense that digital interfaces allow the creator to combine different materials by the use of cut-and-paste functions. Furthermore, the possibility to combine very remote matrices, materials, ideas, symbols etc. might be enlarged because of the comprehensive access to online materials provided by digital distribution on the World Wide Web.

Lev Manovich seems to rely on this affinity between digital software and theories of creativity. In the beginning of this chapter, he was quoted as suggesting that ‘[w]hile previously the great text of culture from which the artist created her own unique ‘tissue of quotations’ was bubbling and shimmering somewhere below consciousness, now it has become externalized’ (Manovich, 2001, p. 127). The suggestion by Manovich is extreme, in the sense that it appears a bit simplistic to assume that our accumulated experiences or memories is now exchanged with an external memory such as the World Wide Web. On the other hand, according to some media theorists, such as Marshall McLuhan (1964) and Walter Ong (1982), a new media partly overtakes functions previously conducted by human memory (Finnemann, 2005, pp 58-60). Further, it seems reasonable to suggest that digital technology might provide new opportunities that influence on the creative process. Thus, the proposal made by Manovich is partly taken seriously in this section.

It may be questioned to what degree creativity can be understood as an unconscious act (see Chapter Five and Weisberg, 1986, pp.15-34). Nevertheless, the notion that creativity relies on a kind of combination between a person’s accumulated experiences is widespread within the field of creativity research (see Chapter Five, section 5.4). Thus, it seems obvious to compare the theories of creativity and the principles inherited in digital software. If we follow the suggestions made by
Manovich, our memory is now partly supplemented with external sources. Furthermore, digital interfaces enhance the ability to select and combine these sources:

*The practice of putting thing together a media object from already existing commercially distributed media elements existed with old media, but new media technology further standardized it and made it much easier to perform. What before involved scissors and glue now involves simply clicking on ‘cut’ and ‘paste’. (Manovich, 2001, p. 130)*

According to the above you might end up with a rather provocative statement about the seeming benefits of digital technology in terms of creativity. The argument relies on two assumptions. First, creativity is understood as combinations of remote associations. Two, the interface and the distribution of digital material support such combinations of remote associations. Hence, digital technology promotes creativity.

Naturally, there are several problems with such an argument. First of all, what about the user’s intention, his ability to select a successful combination, his ability to search fruitful places, etc. (see Chapter Five, section 5.3 and 5.5) Further, it seems counterintuitive that people today should be more creative than people in the past. On the other hand, if creativity is understood as something distributed in a network, the suggestion seems more appropriate. Accordingly, it is not the individual’s autonomic creative competences that are enhanced but rather the network’s ability to generate creativity. Such a notion might be supported by studies demonstrating that diverse urban communities seem to promote creativity (Florida, 2002; Csikszentmihalyi, 1994, pp. 145-153). However, creativity is essentially a construction and not an objective phenomenon. Hence, a reinforcement of remote associations does not necessarily result in more creativity according to the system model described in Chapter Four (section 4.4). In other words, technology might promote remote associations but not necessarily promote creativity.

In line with the above, there seems to be an affinity between musical software related to the sequencer paradigm and the theory of BVSR (see Chapter Five). In the below, two screenshots from GarageBand are presented. In the first one, it is possible to see how loops can be selected among many different variations. In the second screenshot, it is possible to see how the loops can be combined in various ways. When the user combines different loops the processes are partly blind, in
the sense that it is not possible to know exactly how the music will sound. This trend is reinforced because the loops often consist of many sounds. In other words, the complexity is amplified. Thus, it may be argued that the GarageBand interface in some ways promotes blind processes of creativity. However, the GarageBand also prevents specific types of blind processes in the sense that atonality and polyrhythm are avoided (see above).

The essential point is that the GarageBand interface seems related to some of the notions about creativity presented in Part Two. Thus, it is understandable why Manovich suggests that digital technology is somehow externalising creative processes. As discussed earlier, I find this assumption a bit bold and speculative. Nevertheless, from my perspective two issues are relevant to stress. First of all, as suggested by Latour, human and non-human actors are intertwined. In other words, the way humans think is intertwined with the way software works (Latour, 1999b, pp. 176-179). So, even though digital technology might not represent an externalization of creative processes, it still tells something about the merchansim of creativity. Thus, technology might be very relevant to investigate in order to understand the phenomenon of creativity. Second of all, I find it reasonable to assume that software related to the sequencer paradigm promotes a certain type of creativity. This will be discussed further in the analysis of the case studies in Part Five.

8.7 Summing up

In the chapter I have discussed digital technology in order to demonstrate how the GarageBand interface promotes a certain type of creativity. Further, I have discussed how the GarageBand interface seemingly is connected to specific notions of creativity, musical traditions, and aesthetics. Thus, the investigation has been inspired by actor-network theory in the sense that different human
and non-human actors have been identified and connected. However, the balance between human agency and the agency of non-human actors represents an essential question. In other words, what is the role of human intention, autonomy, and expertise if the human is essentially embedded in a network? And may technology promote creativity if the human actor only plays a limited role in the process of creation? These issues are the main topics in the following chapter.
Chapter Nine: Autonomy and expertise

9.1 Technology as a tool for personal creativity

In a thorough analysis of Norwegian educational politics, Petter Dyndahl identifies two main discourses representing a positive and a negative notion of technology (Dyndahl, 2002, pp. 172-173). Dyndahl associates the two categories with, respectively, a utopian discourse comprised of so-called technophilia and a dystopian discourse comprised of so-called technophobia. According to his analysis, technology is often understood as ‘a tool for personal creativity’ within the utopian discourse (Dyndahl, 2002, p. 180).

Dyndahl’s analysis reflects conceptions within the field of music technology in general. Thus, technological developments during the last 40 years within the field of music production are often associated with a complete new area in terms of musical creativity: ‘The advent of digital technology in the early 1980s marks the beginning of what is the most fundamental change in the history of Western Music since the invention of music notation in the ninth century’ (Taylor, 2001, p. 3). According to this viewpoint, digital technology enables people without specific musical skills to be creative:

*Powerful computers and fast Internet connections have become affordable and widely available. The technology’s ability to manipulate audio has meant that many people, who up until now did not perceive themselves to be musicians, can handle, create and communicate music using their computers. They employ inexpensive music software and hardware, which does not require ‘traditional’ musical skills or conceptual understanding.* (Crow, 2006, p. 123)

The notion is equally reinforced by the industry of musical software. Thus, it is typical to emphasize that the use of musical software don’t require any musical skills (see advertising for eJay below).
Further, the notion forms the point of departure in various projects preoccupied by the development of new technological equipment meant to enhance creativity and expression among adults and children without formal musical training. The construction of ‘RoboMusicKids’ by Danish scientists represents such an example. In the project, Bærendsen, Jessen, and Nielsen constructed robotic building blocks, by means of which the user can combine different musical elements, ‘regardless of their prior experience with instrumental music tuition’ (Bærendsen, Jessen & Nielsen, 2009, p. 405). Thus, this group of scientists is advocating the idea that musical creativity might be enhanced among musical novices through the application of new technological designs:

The RoboMusicKids project is based on the notion that technology, when used in a specific manner, can serve as a gateway into musical expression, experimentation and play, with the possibility of bypassing obstacles which may stand in the way of this in the more traditional musical contexts, such as the need of a certain type of craftsmanship, specific aptitudes or abilities. (Bærendsen, Jessen & Nielsen 2009, p. 400)

The optimistic viewpoint discussed above, is presented in various versions by authors preoccupied with the study of aesthetics and digital technology, including Folkestad (1996), Sefton-Green (1999), Manovich (2001), Buhl & Hemmingsen (2004), and Pennycook (2011), among others. However, opposed to such notions, new forms of music-production are equally being criticized for generating minimal musical quality, superficiality, and doubtful music-pedagogical settings. According to this pessimistic, or dystopian perspective (Dyndahl, 2002), musical productions by novices must primarily be regarded as unreflective and unintentional combinations of prefabricated material. Hence, the ‘composers’ are not really composers in a traditional sense, given the absence of craftsmanship as well as intention (see e.g. Sefton-Green & Buckingham, 1998; Keen, 2007;
Furthermore, the pedagogical potential of technology is questioned, in terms of facilitating creative competences (Crow, 2006, pp.122-124). In the present chapter the implications of music technology will be discussed with respect to the different discourses outlined.

9.2 Digital technology and freedom of choice

According to the previous chapter, sequencer software in general is characterized by features that may be understood as paradigmatic, facilitating a specific kind of aesthetic. However, different types of sequencer software program exist. In the following, I will argue that software may be characterized according to different degrees of freedom of choice from the perspective of the user. Thus, some sequencer programs only allow the user to conduct few types of operations, whereas others offer a substantial number of parameters to choose between. In the following the attempt is to discuss and categorize different types of software, how they is related to different levels of expertise, and how this may influence the creative process, freedom of choice, and levels of autonomy.

9.2.1 Software and music pedagogy

The fabrication of musical software is related to pedagogical traditions within the musical field in general (Boysen, 2015b). Most obvious are the similarities between musical software designed for children and the so-called Orff Instruments. The Orff Instruments are mainly designed in order to facilitate improvisation and ensemble-play among children (Orff, 1932, 1964). The instruments embody a limited number of notes and the selected notes belong to a specific musical scale. Thus, the children are not allowed to break with predefined musical norms. No matter what, the music will sound fairly acceptable (Orff, 1964; Boysen, 2015b). The parallel to musical software is significant. Thus, software designed for children equally offers the user a limited number of choices. Banja Band may represent such type of software. In this program, the user is only allowed to turn on and off five different loops. If the user plays the loops together, the music will sound acceptable according to traditional musical norms. Other examples are the Lego Music Composer and RoboMusicKids (see above, section 9.1).
9.2.2 Rules and freedom

The freedom of choice implemented in musical settings is seemingly related to questions of subjective autonomy. In the article *Creative thinking in the context of music composition*, Maud Hickey discusses the question of choice in relation to different types of pedagogical settings. She suggests that there exists a specific connection between the musical outcome, the task, the implementation of musical rules, and the number of parameters provided. This basic connection is further explicated through the construction of a diagram that is presented below (Hickey, 2003, p. 43). It should be mentioned that the way Hickey uses the diagram resembles the way positional maps are used within situational analysis in order to facilitate reflections (see Chapter Two). Accordingly, the diagrams play a key role in this chapter as they do in my memos (see Appendix M).

### Diagram 9.1 Rules, parameters, and musical outcome (borrowed from Hickey)

<table>
<thead>
<tr>
<th>Maximum Craftsmanship/rules</th>
<th>‘Rule-bound’ Composition</th>
<th>Creative Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Craftsmanship/rules</td>
<td>Non-musical exercise</td>
<td>Chaotic ‘noise’</td>
</tr>
<tr>
<td>Closed task</td>
<td></td>
<td>Open task</td>
</tr>
<tr>
<td>Few parameters</td>
<td></td>
<td>Many parameters</td>
</tr>
</tbody>
</table>

On the vertical line, the amount of craftsmanship and musical rules are outlined. As far as I interpret Hickey, this is a question of task formulation as well as a question of the skills of the student. Thus, the student may be asked to follow specific musical rules. However, this is only possible if the student is able to follow these. On the horizontal line the degree of openness of the task is outlined, with respect to the number of instruments, notes, sounds, etc. Thus, a closed task involves a number of specific parameters chosen a priori, whereas an open task involves no parameters. In other words, the horizontal line outlines numbers of possible choices.

According to Hickey, four scenarios may be identified based on this diagram. First, the ‘non-musical exercise’ is explained as a result of a closed task with minimal musical rules involved, e.g.
the distribution of notes in a bar without any musical norms and rules: ‘A closed musical assignment that has several parameters, yet is bound by no traditional craftsmanship guidelines, will most likely result in an exercise that is neither musical nor creative’ (Hickey, 2003, p. 42). Second, ‘chaotic noise’, which is explained as the result of ‘an open musical assignment with no parameters given (‘compose anything you want’) and devoid of any guidance or understanding of craftsmanship’ (p. 42). Third, the ‘rule-bound’ composition, that ‘results when the assignment is bound by too many parameters (e.g. key signature, time signature, length, style, and notes) and strictly follows prescribed past-writing rules’ (p. 42). Finally, the ‘creative composition’ is understood as the result of a ‘room for variety and uniqueness, while teaching techniques for good composition practice will encourage the production of truly musical creative compositions’ (p. 42). In other words, ‘creative composition’ is the result of a balance between too few and too many musical rules/norms, as well as a balance between too many and too few choices/parameters.

Hickey’s diagram reflects general notions about pedagogical settings and creativity in the sense that too many strict instructions and too many attempts to follow rules are considered inhibiting for the creative process (e.g., Amabile, 1996, pp. 91-96). On the other hand, no involvement of rules results in meaningless noise (see Appendix O for further discussions of Hickey’s model).

9.2.3 Rules and freedom and musical software

Hickey is primarily adopting a pedagogical approach without specific focus on materiality and mediation (see Chapter Eight). Thus, the teacher is described as the main coordinator of the musical setting, and questions of mediation, e.g. the notation-system and different forms of instruments, are not explicitly considered. In other words, what Hickey describes as a musical setting without any rules and with endless parameters involved might still be rather filled with rules, norms, and prescribed parameters, in the sense that such elements are represented in the applied media/instruments. Hence, it seems reasonable to include the aspect of technology more explicitly in the diagram drawn by Hickey. In the following, Hickey’s model will be applied in order to discuss how different musical software might be understood in regard to freedom of choice, implementations of rules, and parameters involved.

If the role of technology is implemented in the outlined diagram, the vertical axis represents different degrees of rules and norms represented by the software (see diagram 9.2). According to
Hickey’s model, the continuum also includes the craftsmanship represented by the user. However, what is central to musical software is that the outcome does not necessarily depend on the user’s musical competence. In other words, human craftsmanship is partly substituted by non-human craftsmanship. Thus, by adopting a specific kind of musical software, the outcome will be characterized by well-known musical norms almost regardless of the user’s actions: Banja Band is an example of such a type of software. On the contrary, Logic represents few rules, in the sense that the user can create different types of music that break with common musical norms. Further, algorithmic-based software such as MAX might be considered even less rule-bound. Yet, such musical software is still based on a certain paradigm and promotes a specific type of music (see Chapter Eight, section 8.3).

The horizontal axis in the diagram below outlines the number of parameters and choices represented in the software. Thus, software like Banja Band represents few choices and parameters, whereas Logic represents many choices in the sense that you can do many things with the software. In the below, different types of musical software are incorporated in the diagram.

<table>
<thead>
<tr>
<th>Maximum Craftsmanship/rules</th>
<th>Banja Band</th>
<th>Lego-music composer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Craftsmanship/rules</td>
<td>GarageBand</td>
<td>Logic</td>
</tr>
<tr>
<td>Non-musical exercise</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td>Closed task</td>
<td>Open task</td>
<td></td>
</tr>
<tr>
<td>Few parameters</td>
<td>Many parameters</td>
<td></td>
</tr>
</tbody>
</table>

### 9.2.4 Positioning musical software on the basis of freedom of choice
One of the problems of placing different types of software in the constructed diagram is that they operate with several platforms. Thus, GarageBand, Logic, Cubase, etc. can be used in very different ways. You can record acoustic instruments and use the software basically as a tape recorder. You can apply the MIDI features and primarily use a MIDI keyboard for composition. You can work
with samples and loops. Furthermore, you can supply these platforms with more sounds and effects, etc. found online. Accordingly, the musical software is flexible and cannot be unambiguously placed on a scale with respect to rules and number of choices. Nevertheless, by splitting up the different platforms it is possible to draw a map somehow portraying the overall freedom of choice within these types of software.

<table>
<thead>
<tr>
<th>Few rules Implemented</th>
<th>MIDI-recording</th>
<th>MIDI-recording, loop, And audio-recording combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many rules implemented</td>
<td>Online-sequencers For kids</td>
<td>Loops and Garage-band</td>
</tr>
<tr>
<td>Few sounds and choices</td>
<td>Many sounds and choices</td>
<td></td>
</tr>
</tbody>
</table>

MIDI-recording represents relatively few constraints (few rules implemented) in the sense that you can play many notes and you don’t have to follow a specific tempo. Still, musical norms are of course implemented through the adoption of the MIDI keyboard that only allows the user to play twelve different notes, etc. The number of choices between different sounds and effects depends on the musical software within which the MIDI feature is embedded. Thus, software such as Fruity Loops and the loop platform in GarageBand represent many different choices in the sense that you can choose between many loops. However, there are still many rules implemented. Finally, sampling and audio recording represent many choices and few rules. GarageBand includes all the described platforms simultaneously. Thus, GarageBand may be used in a manner whereby many constrains are imposed (the loop section) or few rules are imposed (sampling, audio recording, MIDI)

### 9.3 Expertise and freedom of choice

Clearly, the software compensates for limited musical competences in the sense that it is possible to put together different loops and they will still belong to the same key, etc. Accordingly, the ‘chaotic noise’ of Hickey’s model may be avoided. However, this compensation comes with a price; less freedom of choice means fewer opportunities to break with predefined rules, norms, and forms. Consequently, the composition might easily be described as ‘rule-bound’ (according to Hickey’s
model). Equally, a piece of software that is meant to be used by a musical expert might result in ‘chaotic noise’ when utilized by novices.

The latter is seemingly the case in a study I did among children aged from seven to eight during the first phase of the case studies (case study number two, 2009, see table 3.2). In the study, the children were asked to bring selected songs to the music studio. In pairs, they were encouraged to sample pieces of music from their selected repertoire, e.g. a sound of a violin or a drumbeat. Finally they were encouraged to combine the music in new ways. In other words, they were invited to apply a copy-paste strategy as described in Chapter Eight. However, this method might ultimately require a great deal of competence in the sense that you often have to put musical pieces together that might differ in terms of harmony, rhythm, etc. Basically, this also means that the level of freedom of choice is relatively high, in the sense that no rhythmical or harmonic constraints are imposed by the software. In other words, the software doesn’t compensate for the users’ lack of musical competence.

In the study, the majority of the compositions might be interpreted as ‘chaotic noise’ as well as rather original in the sense that musical norms are put aside. Accordingly, it seems reasonable to suggest a relation between different types of musical software, level of expertise, and possible outcomes. In the diagram presented in the below, such connections are depicted.

**Diagram 9.4 Expertise, constrains, software, and musical outcomes**

<table>
<thead>
<tr>
<th>Expertise</th>
<th>Meaningless?</th>
</tr>
</thead>
<tbody>
<tr>
<td>No expertise</td>
<td>Frutti loops, the loop section of GarageBand = bound to basic rules but still possibilities to create original outcomes and break musical norms</td>
</tr>
<tr>
<td>Many constraints</td>
<td>Few constraints</td>
</tr>
</tbody>
</table>

According to the above, some musical software imposes rules to a degree where there seems to be minimal space for the user to break or interact with the predefined rules. Thus, one might question
the level of the user’s autonomy. For example, when producing music with Banja Band, there are no ways to change the predefined music. The same applies partly to loop platforms such as the loop section in GarageBand. Although the user can combine the loops in endless ways, they are still forced to follow rhythmical and harmonic predefined musical norms. On the other hand, software like MaxMSP might allow the user comprehensive freedom. As described in the section about the synthesiser paradigm, it is a widespread belief that MaxMSP allows people to make music from scratch (see section 8.3 and Appendix L). Thus, the use of such software might be related to a higher degree of autonomy. As described in Appendix L, this notion might be questioned. Nevertheless, it seems reasonable to suggest that different types of software are related to different degrees of freedom (see diagram below).

Diagram 9.5 Levels of Autonomy

<table>
<thead>
<tr>
<th>Maximum Autonomy</th>
<th>Minimal Autonomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIDI-recording, sampling, audio-recording, and MAX.</td>
<td>‘Fruti loops’, the loop section of ‘garage band’</td>
</tr>
<tr>
<td>Online-sequencers for kids, e.g. ‘Banja Band’</td>
<td>Many constraints</td>
</tr>
</tbody>
</table>

The question of autonomy was frequently addressed by the participants in the case studies. In the following interview, the two participants from the third phase of the case studies, Henrik and Mikkel discuss the question of autonomy. Both are skilled musicians. Besides, Henrik has worked with different kinds of music software for at least eight years (see Chapter Seven). They had just finished group session number three when the following interview took place.

*Henrik:* I am not into the type of thing where you take something, which is already made and put it up.

*Mikkel:* No, I see your point.
Henrik: It reminds me of the time when I worked with eJay, when I was twelve years old.
Mikkel: Ååå, I remember that...
Henrik: When you could take different boxes with a loop or a melody or something – and put it up in a way that fitted. Then I feel very restricted. That doesn’t interest me. It needs to be created by ME [Henrik emphasizes the word ‘me’]. You have to make it yourself – otherwise it is not fun.
Mikkel: It was also my first thought, when we began; we were going to make the melody above, and then make the thing beside – but then I thought, it is actually a bit ambitious.
Henrik: Yes, yes, of course. We should rather just have grabbed some loops and made something out of it. That is also kind of fun. It is how you begin, if you don’t create it from scratch, and if you don’t have the skill to do so. Then you begin with eJay, where you can use stuff that is created for you. And then you can put it together like a piece of sound puzzle game, actually. And then you have to make it fit, etc. (Interview with Henrik and Mikkel, the third phase of the case studies, session number three, 2013)

It is evident that Henrik was referring to some kind of hierarchy that involves different composition methods, level of expertise, and level of freedom and autonomy. Based on Henrik’s own experience he established a continuum, going from novice to expert performance. As a novice, you can work with musical software such as eJay. You combine musical material ‘that is already made’ and the point is to ‘grab some loops’, ‘put it up’ and ‘make it fit’. Thus, it is possible to create something reasonable in a short length of time with a minimum of skills. However, the composer is very ‘restricted’. Eventually, as you become more skilled, it is possible to create your own melody and accompaniment. According to Henrik, this process is much more interesting in the sense that the restrictions are not predominant. Thus, it is possible to make a much more personal product. As Henrik describes it, the music has to be ‘created by ME’. Thus, the question of autonomy appears to play a crucial role in terms of Henrik’s motivation and approach to music-making. In the following model the continuum described by Henrik is depicted.
Model 9.1 Minimum and maximum autonomy

According to the case studies, it seems like Henrik’s approach to music-making is quite exemplary for the experienced participants. First of all, participants with prior experience in terms of musical software frequently refer to a kind of hierarchy between different forms of music software. This is evident when they talk about their musical background, which typically includes a journey from novice to expert, involving the employment of different pieces of software (as was made visible to me in my final interview with Kristian, Emil, Casper, and Henrik, third phase of the case studies, 2013-2014).

Further, it seems evident that the experienced participants in general prefer working on a platform that is considered to provide maximum autonomy. In the case studies the participants all have the opportunity to work with loops as well as keyboards or other instruments. However, in the final exercise the majority of the novices decided to work with loops and the majority of the experienced musicians and the experts decided to work with MIDI keyboard or another instrument. In the interviews, they explained this choice by referring to the apparently higher level of control that the use of traditional instruments entails (the connection between autonomy and the use of traditional instruments will be discussed further in Part Five and Part Six).

9.4 Is the computer taking over control?

In Chapter Eight I argued that different types of software promote specific types of processes, aesthetics, and musical outcomes. In this chapter, I have argued that some types of software provide the user with a limited number of choices. Thus, it seems obvious to ask whether the computer is
simply taking over control. This question is connected to the issue of transparency. In the following I will discuss this issue with reference to Dyndahl and Folkestad, two of the most influential Scandinavian researchers in the field of music technology.

**9.4.1 A dispute between Folkestad and Dyndahl: Levels of transparency**

In an investigation of computer-based music-making, Folkestad discusses the question of transparency (1996). According to Folkestad, software and hardware guide the user in specific directions. Thus, the technology is not understood as neutral or transparent. Nevertheless, based on his investigations, Folkestad still argues that the influence of the technology might be rather limited.

> Although the technology to some extent mediates ideas of how to create music, the computer seems to have had the function of a tool for realising musical ideas, and thus being more or less transparent in the creative process. (Folkestad, 1996, p.203)

Further, questions of transparency played a key role when Folkestad was choosing specific musical software to be used in his research. Folkestad seems to be suggesting that some type of musical software is more manipulative than other types of software.

> One important issue is the information and implicit instructions given by the sequencer program, by the way its interface is designed. As the sequencer program itself may direct the user to compose in a certain way, the goal is to find software that steered the user’s thinking as little as possible. One of the advantages with the selected program as compared with other sequencer programs is that the design of the interface is very clear [...] The user starts with a blank sheet, merely displaying a multi-track recorder, and only the absolutely essential symbols and icons are shown. (Folkestad, 1996, p. 203)

Dyndahl adopts Folkestad’s study as a platform upon which the question of transparency can be discussed. Dyndahl’s general approach to technology is that technology is a discursive medium. Thus, technology is not neutral, but influences the act of creation. Although Dyndahl does not explicitly refer to actor-network theory, he is suggesting an approach similar to theories with a focus on materialisation. According to Dyndahl, Folkestad wrongly concludes that his produced
empirical material indicates that the applied technology is not determining the act of creation and therefore must be understood as relatively transparent. According to Dyndahl, the relation between humans and technology is much more subtle and complex in the sense that ‘det eksister ingen oversiktelige og entydige en-til-en-relasjoner hva gjelder årsak og virkning i dette feltet’ [‘there exists no clear and unambiguous one-to-one relationships in terms of cause and effect in this field’] (Dyndahl, 2002, pp. 203-204).

In the light of Dyndahl’s critique, it is essential to stress that Folkestad is actually not rejecting the directing force of technology. Still, Dyndahl might have a point in the sense that Folkestad is possibly underestimating its role. However, I do find Dyndahl’s argument problematic for several reasons. Dyndahl criticises the idea that some types of software might be less directing than others. Instead he emphasizes that humans and material are essentially intertwined. In that respect, it seems to me that different levels of discussion are confused. Dyndahl’s general notion about the complex connections between material, social, and mental elements reflects general notions of materiality and these will not be questioned here. However, this general macro-perspective hardly legitimises the rejection of a more detailed and empirically-based discussion of how different types of technology influence the user in any specific case. It seems obvious that some types of technology strongly direct the user, whereas other types of software do not do so to the same degree (see section 9.2). Furthermore, it seems obvious that users may interact with the computer in different ways. In other words, on a general level, questions of autonomy and subjectivity might be complicated to answer in the sense that a subjective action will always be intertwined with complex networks of a cultural, social, mental, and material nature (Barthes, 1986; Latour, 1999b, see Chapter Eight). However, this doesn’t mean that it is impossible to investigate a specific interaction between a human and a piece of software.

In order to approach questions of technology and transparency, it might be relevant to refer to the discussion of user-centred designs. One of the major motivational factors behind this innovative strategy is the empirically-based knowledge of users’ diverse and heterogeneous applications of manufactured designs. Thus, Eric von Hippel writes in his book Democratizing Innovation: ‘Meta-analysis of market-segmentation studies suggests that users’ needs for products are highly heterogeneous in many fields’ (Hippel, 2005, p. 6). Furthermore, empirical studies indicate that users develop idiosyncratic ways to apply designs and products. This suggestion is convincingly
presented by Anne Mette Thorhauges in her PhD dissertation, *Computerspil som Kommunikationsform* [Computergames as communication] (2007), in the sense that it is demonstrated how users invent autonomous ways to apply different designs. In the light of such studies, it appears reasonable to suggest that users of technical software are capable of forcing the process in different directions, in spite of the specific discourse the software represents.

Conclusively, I agree with Dyndahl in the sense that it does appear a bit hasty for Folkestad to claim that the computer is ‘more or less transparent in the creative process’ (Folkestad, 1996, p.203). However, subjective agency cannot be ignored. Equally, the specific degree and type of influence in regard to specific types of software must be recognized. In the present thesis, the empirical material strongly indicates that on the one hand users are strongly influenced by the software they are using, and on the other hand users are still applying very diverse compositional strategies (see Chapter Eight and Part Five). Thus, it seems rather obvious to suggest that the interaction between human and non-humans can take many different forms. Of course, this doesn’t mean that the entire network of connections between human and technology can be uncovered. In other words, suggesting that a user is able to force the technology in different directions is not the same as suggesting that the user is acting outside the influence of technology. The user is of course still under the influence of other actors, humans as well as non-humans.

### 9.4.2 Case studies: Questions of transparency

Although the loop section in GarageBand promotes specific musical principles, the user is still able to choose to apply loops in very different ways. The following examples demonstrate the various ways in which loops can be employed.

*Linea is 22 years old and is a musical novice. She composes a song primarily adopting different guitar-loops. The loops contain different melodic variations played by the same guitar. The guitar-loops are placed after each other on the same track, constructing a sixteen bars long melodic phrase, indicating a sectional structure. In the interview she explains how she would prefer working with voices but that she couldn’t find anyone that satisfied her. She is, according to herself, mainly preoccupied by the melody. In the editor window she has placed the bright instruments in the top and the deep instruments in the*
button, imitating the structure of a score. (Video observation, second phase of the case studies, case study number three, 2011, see table 3.2)

Martin is 22 years old. He sings in several bands, plays the guitar and composes pop/rock music. He has applied rhythm guitar-loops, solo guitar-loops, bass-loops and drum-loops. He has placed different loops successively on the same track, constructing different sections. Martin describes the form as an ABABA form. Accordingly, the structure may be understood as sectional rather than repetitive. In the subsequent evaluation his classmates emphasise the fact that Martin has created a piece of music that sounds like a professional rock/pop song. (Video observation, second phase of the case studies, case study number three, 2011, see table 3.2)

Laura is six years old. She chooses a loop containing piano and drums. She utilizes the loop button, in order to make a long-term loop section. She chooses a second loop and does the same. Finally she has four different loops placed beneath each other. The structure is clearly repetitive. Laura is apparently not trying to materialize an inner vision. The process seems rather coincidental (Video observation, DBR study, 2013)

As demonstrated in the above, the adoption of loops seems quite different from case to case. However, there seems to be a correlation between age and the interaction with the software. Accordingly, young children might primarily construct music that is repetitive, whereas adults produce music that contains more sectional elements (see Boysen 2013b). It seems reasonable to suggest that this might have to do with their levels of musical and computer-related competence. Thus, young children engage immediately on the terms of the software, applying the most obvious or easiest features in order to build up music. In other words, the young children seem to be strongly influenced by the technological affordances offered by the software. Conversely, the adults seem to push the outcome and the ability of the software in certain directions based on their aims and visions.

The reflections above might benefit from a reference to the concepts of installation and constellation (Qvortrup, 2006, pp. 35-37). From this point of view, a process might be understood as an installation if the creator is using the surroundings to materialize her inner vision, regardless
of the resistance of the material. Conversely, a process might be understood as a constellation if the creator is interacting with the material and responds to the characteristics of the material. In other words, one might use the musical software in order to create a specific idea, regardless of the sounds and features provided by the software. Or, one might proactively explore and incorporate the sounds, features, and possibilities provided by the software. Further, according to the example with Laura presented above, you might also include a third category which I have labelled ‘absorption’ in the model below. This category refers to processes where the non-human actor seems to be dominating and determinative rather than the human actor. In other words, the human actor seems to get absorbed in the sense that they are responding to the affordances of the software without trying to install any specific idea or vision. The label might seem too radical, but the basic point is to demonstrate that the interaction between human and non-human seems to include different types of scenarios and balances of power. Thus, the computers’ transparency is not a question of yes or no but rather a question of how and how much.

| Absorption: The non-human in command | Constellation: A dialog between non-human and human | Installation: The human in command |

Model 9.2 The interaction between human and non-human actor

In Qvortrup’s point of view the category constellation represents the most successful form of creativity (Qvortrup, 2006, p. 36). However, I find this statement a bit simplistic in the sense that an insistently attempt to materialize an intrinsic vision naturally also can lead to creativity. Nonetheless, the analysis conducted in Chapter Ten and Chapter Eleven indicates that following a plan consistently might inhibit creativity.
9.5 Summing up

In the chapter, musical software and questions of autonomy have been addressed. Accordingly, it has been demonstrated how musical software is designed to address different levels of expertise and how, to various degrees, it imposes rules and norms on the user. In that respect, it has been argued that the software influences the processes and the outcomes, but does not determine them. Nonetheless, it has been exemplified how novices, especially children, might be influenced more explicitly by the software. Finally, it has been demonstrated how questions of autonomy play a substantial role for the experienced musicians and experts participating in this study. Thus, musical instruments are in general associated with a high degree of autonomy, whereas the employment of loops is associated with minimum autonomy. Questions of autonomy will be discussed further in the next parts of the thesis.
Part Four: The case studies
Chapter Ten: Two case studies

10.1 The focus of the analysis: what am I looking for?

In the following analysis a number of specific issues are addressed. These points of focus are inspired by the theoretical framework outlined and research within the field of creativity. However, most importantly, the focus points are formed by the empirical material provided by the first and second phase of the case studies, the fieldwork, and the interviews with professional artists. In Appendix J, the results of the case studies in the first and second phase are sketched out. Further, the results of the empirical investigations in general are published in Boysen 2013b, 2014, and 2015b.

The focus points are roughly divided into three intertwined categories; the creative product, the creative process, and the assessment of the products conducted by the evaluation groups.

<table>
<thead>
<tr>
<th>Table 10.1 The focus of the analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The product</strong></td>
</tr>
<tr>
<td>• Codes and norms applied</td>
</tr>
<tr>
<td>• Musical form and structure</td>
</tr>
<tr>
<td>• Craftsmanship and originality</td>
</tr>
<tr>
<td><strong>The process</strong></td>
</tr>
<tr>
<td>• Explorative work, contra plans and strategy</td>
</tr>
<tr>
<td>• Sighted and blind creativity</td>
</tr>
<tr>
<td>• Body and mind</td>
</tr>
<tr>
<td>• Reflection and intuition</td>
</tr>
<tr>
<td>• Coincidence and mistakes</td>
</tr>
<tr>
<td>• The interaction between human and non-human</td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
</tr>
<tr>
<td>• How is the music judged and interpreted</td>
</tr>
<tr>
<td>• What constitutes craftmanship and originality</td>
</tr>
<tr>
<td>• What is the connection between the sender and the reciever</td>
</tr>
</tbody>
</table>

The main question of the thesis is addressed within every category outlined. Thus the implications of expertise are studied through an investigation of product, process, and evaluation. In the analysis below, I focus on two participants: the expert, Jonas, and the novice, Casper. These two participants were mainly chosen because they represent the first circles of case studies in the third phase. Besides, Jonas’ level of expertise is relatively high, which is important when trying to explore the
differences between novice and expert behavior (see Chapter Three, section 3.3.2). Further, they are comparable in terms of gender and education. However, they are not more representative than the other participants.

The movies about Jonas and Casper and the processes of composition may be watched on YouTube:

- *Jonas – an idea is born*: [https://www.youtube.com/watch?v=R_BmqVmvNCA](https://www.youtube.com/watch?v=R_BmqVmvNCA)
- *Casper – an idea is born*: [https://www.youtube.com/watch?v=hHyU9WpXz-w](https://www.youtube.com/watch?v=hHyU9WpXz-w)

### 10.2 Case study number one: Jonas

Jonas is 25 years old and grew up in the town of Fuglbjerg, not far from Slagelse. His mother is a school teacher and his father works in the oil refinery industry. His father does not play any musical instruments, but his mother plays guitar and piano to a reasonable level. His brother plays guitar and his elder brother plays the drums. They had a guitar and an old piano at home when Jonas was growing up.

Jonas was educated at the HTX and has worked in schools and kindergartens as a pedagogical assistant. He is now studying pedagogy at University College Zealand. Jonas began playing piano in second grade, and has played ever since. He was taught piano for approximately ten years and he has played in several blues and rock bands. Furthermore, he has played music from the classical repertoire, including Beethoven and Mozart. He has considered studying at the Royal Academy of Music in Copenhagen. He has played computer games quite a lot, but has no comprehensive prior experiences with musical software.

Jonas listens to many different genres, including rock, classical music, heavy metal, dance, etc. However, he listens primarily to rock, particularly from the eighties, or ‘rock with hammond organ’, as he puts it.

### 10.2.1 The composition: structure, form and genre

The music composed by Jonas consisted of five layers (see screenshot 10.1 below). Four of them were created using a MIDI keyboard. One of the layers consisted of a prerecorded sample, which
was looped throughout the entire composition. The MIDI-sounds applied resembled analog instruments: this includes the sounds of electric organ, electric guitar, electric bass and acoustic drums. Thus, the orchestration resembles a traditional rock/blues-band ensemble.

The adoption of the blues genre is equally reflected in the choice of harmonies, melodic substance, and musical form (see Jonas’ description of form in drawing 10.1 below). Thus, the composition may be described as a c-major twelve-bar blues comprised of traditional blues ingredients such as organ-themes repeated in tonics and subtonics, and electric guitar improvisation.

In addition, the melodic material consists of a traditional blues-scale. For instance, Jonas applies frequently the flattened 7th in the main motif of the organ (see screenshot 10.2 below).
On a horizontal level, the instruments complement each other throughout the composition. In other words, the melodic inputs provided by the different instruments are placed along a horizontal line. In that respect, the content of the main theme may be described as a musical dialog between the organ and the electric guitar (see organ motif above, screenshot 10.2, and guitar motif below, screenshot 10.3). The two instruments are not playing melodic motifs simultaneously but complement each other. Accordingly, the organ’s melodic motif is placed in the first bar and the electric guitar motif is placed in the second, etc. In general this compositional disposition indicates a focus on the melodic horizontal line. Furthermore, the musical dialogs indicate inspiration from the genres of blues, rock, and jazz.

The focus on the horizontal musical elements is also evident in the way that every single instrument played during the composition. In the following screenshot, it is possible to see how a single instrument varied throughout the composition, e.g. the organ. The drums were the only instruments that did not vary throughout the piece. However, the drums were supplemented by the cymbals on the last track (see screenshot 10.4 below).
Conclusively, the composition appears to be an attempt to simulate a live blues-band in the sense that the music is based on improvisations, instrumental variations, musical dialogs, simulations of typical blues instruments, and the adoption of specific melodic scales and norms. This interpretation corresponds with Jonas’ explicit descriptions of the music (see Appendix G and Appendix H).

10.2.2 The process from a macro-perspective

The process leading to the final outcome may be described on a macro-level by the use of the saved GarageBand files. In general, the GarageBand files indicate a very straightforward composition process without any detours, false starts (see Chapter Five, section 5.4), or changes of direction. In below, the screenshots from every round of work are placed in order (the expression ’round’ is used in order to describe every time Jonas is working on the composition).

![Screenshots 10.5 The eight rounds of composition](image)

When comparing the very first saved GarageBand file with the last one, the similarities are substantial. The orchestration consisted of classic rock organ, fingerstyle electric bass, drums and electric tremolo guitar after the first round of work. This is exactly the same orchestration as in the last version. Furthermore, the sounds were identical, apart from the drums, which were replaced in the second round of work. Additionally, many musical elements were already in place in the first round of work, e.g. the main organ theme, the main harmonic shifts, and parts of the applied accompaniment, etc. Thus, the expansion from round to round primarily happened on a horizontal level. This extension is evident on a macro-level, in the sense that the length of the song simply expands in every round. Furthermore, this expansion consists of a precise number of bars, namely twelve. Thus, the composition is simply extended in every round of work with a twelve-bar blues period.
Table 10.2 The extension of bars in every round of work

<table>
<thead>
<tr>
<th>Round</th>
<th>one</th>
<th>two</th>
<th>three</th>
<th>four</th>
<th>five</th>
<th>six</th>
<th>seven</th>
<th>eight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bars</td>
<td>36</td>
<td>48</td>
<td>50</td>
<td>72</td>
<td>84</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Extension</td>
<td>36</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The macro-analysis reveals a process of composition by which the musical idea, form, and structure is settled very early in the process and pursued subsequently. Thus, the composer is apparently following specific strategies and formulas in order to reach their goal (see also Appendix H).

10.2.3 The process from a micro-perspective

In the interview I asked Jonas to choose a musical detail in his composition which he was particularly happy about. This research strategy was driven by an ambition to explore creativity on a micro-level (see Chapter Three, section 3.3.9). Further, by asking Jonas to point out a successful detail I was trying to capture evidence of little-c creativity (see Chapter Four, section 4.5). In the interview, Jonas chose the bass-solo and the guitar-solo. Besides, he stressed that he was satisfied with the fact that he ‘hit the right musical form’.

> Well, I also think that I have created a satisfying piece of music in general. I mean, I think the piece of music sounds exactly like what I had in mind from the very beginning.

(Final interview with Jonas, 2013)

The fact that Jonas is satisfied with the composition because the final result resembles the initial intention is interesting for several reasons. First, it indicates that Jonas had a rather specific idea of the final outcome, even at the beginning of the compositional process. Second, it indicates that Jonas was able to carry out and materialize emergent ideas. Third, it indicates that Jonas actually considered it a good quality that initial ideas were brought to life.

10.2.3.1 The creation of the guitar solo

In the interview, I chose to focus on the creation of the guitar solo, even though Jonas emphasized a number of different musical elements (see above, section 10.2.3).
Jonas: Well, first of all I’ve got an idea of how the guitar must sound – and some of it is inspired by a guy I played with in Svenborg, for instance…
The interviewer: Who played the guitar?
Jonas: Yes, he played the guitar…I am inspired by the music I’ve heard from different bands and the people I’ve played with…and then I have tried out different stuff …as you describe it…I have tried out different things…and when recording it, I think the result has been very good… or at least okay…and then I have made some editing afterwards and in the end, I was really satisfied. (Final interview with Jonas, 2013)

Again Jonas stressed that he had a rather concrete idea about the final outcome before he started playing and recording. However, he still tried out different things which indicate that the initial idea was not concrete on a detailed level. Rather, he had an idea of ‘how it must sound’ (see quote above). Furthermore, he described how he is influenced, not only by specific genres, but also by specific musicians. Accordingly, the connection between Jonas’ composition and his musical training, upbringing, and former experiences becomes very explicit. Finally, Jonas tried to simulate a traditional instrument, namely a guitar. Again, Jonas was explicitly influenced by a specific musical tradition. In the interview, he described how it was crucial that the guitar sounded like it was being played in a specific way:

Jonas: I have adjusted the notes in order to make them sound less ‘plims’-like. Which word did I use? To make it sound more stable – so that it does not sound like I am playing a wrong note.
The interviewer: I think you used the word ‘unconfident’.
Jonas: Yes – exactly ‘unconfident’, like you are playing a wrong note. Thus, I have edited the solo by extending some of the notes in order to make it sound more stable. So it is not just a tone played by mistake – I intend to play this tone – and I have deleted it if I have played a wrong note. (Final interview with Jonas, 2013)

According to Jonas, the guitar solo may signal specific things to the listener depending on how it sounds. This is of course not a surprising statement. What is interesting is that Jonas applied the computer to simulate traditional instruments, and, additionally, transfer the rules and codes from
this tradition into the computer-based compositional process. Accordingly, the guitar-solo must be interpreted, heard, and understood, as if it were being played by an instrumentalist.

When I listened to it, the sound sounded like a guitar, and the very solo sounded like...like a real guitar. I listened to what I played. There is a difference between a keyboard-solo...you can tell that it is played on a keyboard... and a real guitar playing. I listened to that many times. I think I managed to create a solo that sounded like a real guitar. There is a big difference between how you play a guitar-solo and a keyboard-solo. (Final interview with Jonas, 2013)

Consequently, the way the solo sounds may be associated with specific properties and intentions. Jonas pointed out that he was afraid that the solo may sound less confident, like he was playing a wrong note. Apparently, it was important that the listener got the feeling that the musician is competent and that the notes are intended. Thus, Jonas tried to avoid that the listener interpret the music as an indication of lack of instrumental skills, lack of control, and lack of intention.

10.2.3.2 The descending motif adopted from the Svenborg

In the interview, I asked Jonas to choose a musical detail within the guitar solo that he was particularly satisfied with. Jonas selected a four beat long descending motif (see screenshot 10.6 below)

It turned out that Jonas had partly borrowed the guitar motif from the musician from Svenborg that he had played blues with in the past (see above, section 10.2.3.1):

Jonas: Actually, the descending sequence is partly inspired by the guitar-player from Svenborg...he played the guitar really well...I used to play blues with him.
The interviewer: So…there is a reference…or you are drawing on something… anyway, you are partly inspired by a musician you have played with, who played these types of riffs?
Jonas: Yes, he was super-cool. (Final interview with Jonas, 2013)

All though Jonas in general stressed that he had an idea of how the music must sound before playing and recording, he did not explain the creation of the descending motif as the result of a linear movement from idea to final outcome:

The interviewer: When you began playing…did you know that you would create a sequence of this sort?
Jonas: No, when I began…I reckon that it was a coincidence on top of a coincidence…it just fitted together…maybe something suddenly sounds like…you know – I had played some guitar-solo…and I didn’t really know where I was going – I just used my ears – suddenly I felt inside myself that this sequence could fit in nicely – I think I may have had a Svenborg flashback when I heard it – somehow it just fitted…from some of the things that we had played together. (Final interview with Jonas, 2013)

Accordingly, Jonas explained the creation of the descending motif as a result of different circumstances. First of all, he used the word ‘coincidence’, implying that the outcome was not directly intended. Secondly, he stressed that he was specifically influenced by previous musical experiences and sources of inspiration. Thirdly, he stressed that the motif occured in the moment and that he was ‘using his ears’ in the process, somehow indicating that his finger was playing something and his ‘ears’ did the evaluation (see also Chapter Six, section 6.6). Finally, he emphasized that the descending sequence somehow ‘fit in’, implying that music must be appropriate as described in Chapter Four.

Jonas’ description of the compositional process reflects some of the main features normally associated with improvisation. Improvisation is often built upon models, formulas, and familiar material (Pressing, 1988, pp. 132-170; Christiansen, 1989, p. 43; Mouritsen, 1996, Knight 2011, pp. 48-49, Johnson-Laird, 2002, p. 430). This perspective might be supplemented by the view of systematic creativity (see Chapter Five, section 5.4) in the sense that Jonas’ development of new
material was closely connected to his former experiences. Furthermore the process may be described as a kind of dialog between intuitive, tacit operations and a more conscious ‘reflection in action’ (see Chapter Four). However, Jonas was not only improvising. He was also editing and forming the music into a specific final outcome. He was also composing.

10.2.3.3 The creation of the descending motif analysed by the use of video-observation

When Jonas began to create the guitar solo, the accompaniment was already established. According to Jonas, the solo section had been part of the musical masterplan right from the beginning. This is no surprise, in the sense that solos are an essential part of the blues. However, the specific content of the solo has not been created priori. Nevertheless, according to Jonas, he had an initial idea of ‘how the guitar must sound’ (see above, section 10.2.3.1). In the following analysis the point is to explore how the solo was created from a micro-ethnographic perspective.

The key categories of the process of creating the solo may be described as experimentation, improvisation, rehearsing, recording, listening, and editing (see also Appendix G). However, these categories are not completely distinct. Typically, Jonas was working by rehearsing and refining of a specific part of the solo while simultaneously improvising the following part. Thus, Jonas was working, most of the time, with closed-ended processes as well as open-ended processes. The monitoring and presentation of Jonas’ creation of the descending sequence illustrates this specific strategy.

Jonas has been working on the solo for eight minutes. He now plays the solo, accompanied by the soundtrack [17:15:00]. The first part of the solo is repeated unchanged. The last part consists of new material. He scrolls back and does the same again. The first part is unchanged. The latter part resembles the improvisation just made, but is not exactly similar. He does the same again. The first part is unchanged. The latter part resembles the previous improvisation but is not exactly similar. Towards the end of the improvisation, new musical material is created. The newly created figure resembles what is later to become the descending motif. Jonas immediately stops the music [17:16:40]). He plays the entire composed solo again until he reaches the descending motif. He plays the descending motif eight times in different versions. The
first versions he plays in slow tempo. The last versions he plays in fast tempo [17:17:51]. Jonas records the solo from the beginning. He stops. He deletes the solo. He records. The first part of the solo is played unchanged. The descending motif is slightly changed. He stops. He deletes the recording of the descending motif, but keeps the beginning of the solo. He listens. He changes the length of the section. He listens. He changes the length of the section. He listens. He changes the length of the section. He listens. He changes the length of the section. He listens. He practices the descending motif eighteen times [17:20:44]. The first part is now repeated unchanged, whereas the latter part still varies. He is trying to find the right place to start the recording [17:22:40]. He is playing the descending motif three times without recording. He records the descending motif. He listens. He deletes the last part of the recording. He keeps the main part of the descending motif. He plays the descending motif six times. He keeps starting with the descending motif followed by improvisation. It seems as if he is trying to find out how to begin the next section of the solo [17:25:00]. Jonas records the section after the descending motif. (Description of the video recording, 2013)

According to the course of events as presented in the above, Jonas was simultaneously working with musical parts characterized by diverse degrees of consolidation. Thus, before creating the descending motif in the second part of the solo, he has already composed the first part. However, the composed part is still not entirely finished. Rather, the material must be described as two different levels of consolidation. Accordingly, in the moment the first version of the descending motif arose, Jonas had created a musical platform consisting of an opening part repeated unchanged and a following part repeated with variation. Thus, Jonas was working simultaneously with three different levels; a fixed section, an almost fixed section, and a flexible section.

In the screenshot of the guitar-solo listed below, it is possible to get a sense of how Jonas was composing and recording the solo in steps. The entire solo consists of six sections. The descending motif forms the third section.

[Screenshot 10.7 The guitar solo]
It seems obvious to compare the process described in the above with the process of honing as suggested by Gabora (see Chapter Five, section 5.4.2), in the sense that Jonas was getting closer to the final result step-by-step. In other words, Jonas was slowly improving the music, rather than suddenly inventing a completely new idea. Accordingly, the descending motif was formed and modulated by Jonas until it fit. Yet, the first version of the descending motif (emerged 17.16.40 in the video recording presented above), seems to arise all of a sudden. This interpretation seems to correspond with Jonas’ description: ‘suddenly I felt inside myself that this sequence could fit in nicely, I think I may have had a Svenborg flashback’. Thus, I find it reasonable to make a distinction between processes of honing and moments where ideas arise more suddenly and explicitly. However, as demonstrated by the use of the video-observation, such sudden ideas may arise in the ongoing process of honing (see also Chapter Five, section 5.4.3).

10.2.4 The evaluation
The composition made by Jonas was assessed by evaluation group number one, two, three, four, and five (see next chapter). However, in this chapter I choose to focus qualitatively on the second evaluation group’s discussions. As described in Chapter Three, evaluation group number two contained four UCSJ students, Nynne (21 years old), Louise (22 years old), Mads (30 years old), and Fie (22 years old). Nynne, Louise and Fie do not play any instruments besides a few guitar chords learned during an eight-week long music/drama course within the UCSJ. Jonas has played guitar for ten years and has been part of several bands as a singer and a guitarist.

In general, the evaluation group found the music on the one hand anonymous and without any exceptional elements, and on the other hand ‘well-crafted’. This is equally reflected in the quantitative table presented below, in which every student has graded the piece’s ‘value/craftsmanship’ higher than its ‘originality’ (on a scale from one to ten). Thus, the evaluation may support the hypotheses that expertise leads to high degree of concordance with norms, and a low degree of novelty, whereas lack of expertise leads to the opposite (see also Appendix F).
### Table 10.3 Evaluation of Jonas’s composition by evaluation group two

<table>
<thead>
<tr>
<th></th>
<th>Mads</th>
<th>Louise</th>
<th>Fie</th>
<th>Nynne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Originality</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Value/craftsmanship</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Final judgment</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

However, although the students agreed on some points, there were also different opinions present. In general, Fie used phrases like, ‘the music fits together’ and ‘it is consistent’. Conversely, Nynne considered the music to be a ‘funny mix of this and that’. This became quite a discussion in the group. In the end, Nynne stressed that there may not be any contradiction between music that fits well together and music that sounds like a funny mix. In other words, the group ended up with a compromise, still leaving the dispute about ‘a musical mix’ and ‘music fitting well together’ somehow unresolved. Anyway, the other evaluation groups seem to support that the music is consistent in terms of genre (see Chapter Eleven, table 11.2).

In the description and the assessment of the music, the evaluation group frequently addressed questions of authenticity. First of all such questions are related to notions about how the music is created. Fie suggested that the music was made by the use of a single keyboard; ‘you know like a man who plays all the sounds on one single piano’. Louise associated the music with music for computer games. Finally, Mads described the music as something clearly played on a keyboard.

From the perspective of the evaluation group, the electronic simulation of traditional instruments minimizes the music’s authenticity. Mads in particular regreted the fact that the music seemingly is intended to sound like a blues band, even though it is not actually played by a blues band. In that respect, Mads criticized the guitar-solo for sounding like a keyboard.

In the discussion and the questionnaire, I asked the students to point out the most appealing musical detail. Louise chose the guitar-solo as her favorite part. She explained this choice with the words ‘something new happens’. On the contrary, Nynne found the guitar-solo the least successful musical detail. Among other things, she stressed that it sounded ‘too loud’. Nynne and Mads both chose the drums as the most appealing musical element. ‘It creates a god beat’, as Mads put it.
Mads’ and Louise’s choice is interesting because Jonas apparently was very displeased with the drums. In Appendix H it is possible to see how Jonas struggled in order to get the drums exactly how he wanted them to be. According to this analysis, Jonas finally chose to use prerecorded loops because he was not able to construct the drums himself by the use of MIDI. Thus, it is rather surprising that the drums were highlighted in such a positive way by Mads and Louise. One hypothesis is that it might have to do with the different perspectives from which the music is being evaluated. The composer, Jonas, constructed a specific distinction between music created by himself and music borrowed from the software (see Appendix H). However, the evaluation group does not know for sure what was homemade and what was not. Hence, they did not adopt the same distinction.

In general, Mads occupied a unique position in the group, partly related to his musical background. Thus, during the discussions, Mads frequently referred to his musical expertise. For instance Mads stressed that ‘this type of music I could easily have composed myself’. Furthermore, he often referred to genres and composers, for example stating that ‘Bent Fabricious is a giant within the field of music’. Finally, musical expertise was indicated with his body, for example when he played piano with his fingers on the table while he explained that ‘the guitar solo obviously is played on a keyboard instead of a guitar’. Thus, the role of expertise seems to be visible in the way that Mads approached the music. This specific position is also evident in the assessment of Casper’s music (see next section).

### 10.2.5 Final remarks

Jonas’ way of working seems sighted in the sense that he followed specific strategies and he knew how the music must sound a priori. However, in the process of creation, most importantly when he improvised, he seemed to work partly intuitively.

The interaction between Jonas and the technology might be described as an installation: Jonas was trying to make the computer sound like traditional musical instruments even though this was not fully possible (see Chapter Nine, section 9.4.2). Further, Jonas’ masterplan was not changed as a result of the interaction with the technology. Accordingly, he stayed on the same track throughout the process.
In general, in Jonas’ case, expertise seemed to promote appropriateness and craftmanship. Thus, on a reflective level he was relying on specific musical norms. Equally, when he worked more intuitively he seemed to rely on common musical traditions. Conversely, expertise didn’t seem to promote novelty or remote associations. Naturally, associations appear to be crucial, for example in terms of the guitarist from Svenborg. But the associations may hardly be considered remote. This interpretation is supported by the assessment of the evaluation group.

Jonas seems strongly related to specific communities of practice. Accordingly, he often referred to teachers and other musicians that he had been in contact with (see also Appendix H). The influence from the community appears to be important.

10.3 Case study number two: Casper

Casper is 22 years old. He grew up in Slagelse. He studied at the gymnasium. At the moment he is studying pedagogy at University College Zealand. His mother works as a warehouse employee. His stepfather rents out tractors and similar equipment. No one in Casper’s family plays musical instruments. Nor does Casper. However, music ‘plays a big role in his life’ as Casper put it. He listens primarily to electronic music, e.g. LMFAO, David Guetta, and Dada life. However, he also listens to other genres, for example, Cry Baby by Cee Lo Green.

In 2009, Casper watched a movie on YouTube, where a guy explained how to make music using the software Fruity Loops. Casper became inspired, downloaded a trial version of Fruity Loops and started making music. He explains that in the beginning he tried to imitate and copy electronic music that he admired. According to Casper, ‘copying other people’s music is a good way to start’. For example he played in real-time on the computer-keys, accompanying Party Rock Anthem by LMFAO.

10.3.1 The composition: structure, form and genre

The composition consisted of five layers, including piano (grand piano), synth (moonbeam), strings (orchestrated strings), synth bass (techno kit) and drums (hip hop kit) (see below). All the tracks were recorded by Casper, using the MIDI keyboard. The sounds/instruments applied may be described as a mix between western classical instruments (strings and piano) and sounds generally
adopted in electronic music and techno, although these types of sounds also appear frequently in mainstream pop music (Jensen, 2001; Marstal & Jaeger, 2003). Nonetheless, according to the way the sounds are named in the GarageBand (for example ‘techno kit’) it seems obvious that there exists a link between electronic music and these types of sounds.

The musical form may be described as an ABA form, in the sense that the main piano theme introduced at the beginning of the composition (track number one in screenshot 10.8, see above) is followed by drums, bass, and the ‘moonbeam-sound’, after which the piano theme returns. However, one can also describe the music as continuously developing, in the sense that the amount of the musical layers keep expanding. When Casper described the form, he emphasized how the music was based on dynamic movements. In the following sketch Casper drew these dynamic changes (drawing 10.2). Notice that the drawing before the vertical line represents the music composed and the drawing after the line represents his notions about the continuation and climax of the composition. Thus, according to Casper, the composition is not really finished but has to be followed by a dynamic development.
Basically, Casper's music was not divided into specific sections. Rather, Casper faded the different layers up and down by applying the volume feature frequently. Thus, the musical structure may be associated with club music, dance music, and techno music (Tagg, 1994). This reference may also be found in other parameters. Firstly, the music is highly repetitive. Thus, every layer is formed as a repetition of very simple musical elements, e.g. the moonbeam sound and the drum (see screenshots 10.9 below)

![Screenshot 10.9 The moonbeam sound and the drum](image)

Secondly, the composition was partly formed by soundscapes, e.g. established by the use of strings (see screenshot 10.10 below). This focus on the soundscapes is also indicated by the comprehensive use of effects on every musical layer.

![Screenshot 10.10 The strings](image)

Finally, the music did not shifting between different harmonies. Instead the music was based on a single harmony throughout the entire composition. This strategy is equally a typical indication of the genres referred to.

Nonetheless, the main piano theme contained melody as well as different harmonies. This theme was not composed by Casper. Instead, Casper borrowed the theme from the famous song *She Wolf*, composed by David Guetta (2012). However, Casper recorded the theme himself by the use of the
MIDI keyboard. The creation of the main piano theme is an important part of the story about the production of this musical piece and will be discussed more detail in the following.

10.3.2 The process from a macro perspective
An investigation of the GarageBand files reveals that Casper did not follow a specific idea or plan in the same way as Jonas, but seemingly still followed some kind of initially conceived idea. On the one hand Casper shifted direction throughout the process, in the sense that the differences between the sessions were substantial in terms of sound and melodic material (see screenshots 10.11 below). On the other hand, many elements from the first version were still part of the last version, e.g. the piano sound and the recorded bass-melody and drum-beat.

Screenshots 10.11 the six rounds of composition

As listed in the table below, Casper did not expand the composition with a precise number of bars within every round of work, as was the case with Jonas. On the contrary, Casper’s composition was expanded and reduced constantly (see table 10.4 below). Further, Casper did not base his work on a four-bar structure (see table 10.4 below), which is the common organization of bars in the majority of modern and traditional rock/pop music (Jensen, 2001; Marstal & Jaeger, 2003). Thus, Casper did not follow common norms within the field of music and equally did not follow a straightforward process as Jonas did.

<table>
<thead>
<tr>
<th>Round</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bars</td>
<td>55</td>
<td>38</td>
<td>48</td>
<td>43</td>
<td>48</td>
<td>47</td>
</tr>
<tr>
<td>Extension</td>
<td>55</td>
<td>-17</td>
<td>10</td>
<td>-5</td>
<td>3</td>
<td>-1</td>
</tr>
</tbody>
</table>
10.3.3 The process from a micro perspective
As with Jonas, I asked Casper to point out a musical element that he was particularly happy about. Casper chose a repeating melodic line that he played on the MIDI keyboard and combined with a sound, named ‘moonbeam’. Accordingly the musical element is referred to as the ‘moonbeam motif’ in the following discussions. During the interview Casper and I tried to unfold how the moonbeam motif came to life and which types of qualities the motif represented from Casper’s perspective. In the analysis Casper’s explanations are compared with the video-observations of the composition process.

10.3.3.1 The moonbeam motif
The creation of the moonbeam motif may be generally described by the following table based on the saved GarageBand files and the ongoing video-recordings. Every action directly associated with the construction of the moonbeam motif is listed.

<table>
<thead>
<tr>
<th>Round</th>
<th>Actions directly regarding the moonbeam motive</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>Casper records the melodic motive later to become the moonbeam motive. He is applying a bass sound, called Hip Hop Kit.</td>
</tr>
<tr>
<td>Two</td>
<td>The melodic Hip Hop Kit line is muted but not deleted.</td>
</tr>
<tr>
<td>Three</td>
<td>The melodic Hip Hop Kit line is muted but not deleted. Experimentations with the moonbeam sound but nothing is recorded with the sound.</td>
</tr>
<tr>
<td>Four</td>
<td>The melodic Hip Hop Kit line is muted but not deleted. The moonbeam sound still appears but nothing is recorded.</td>
</tr>
<tr>
<td>Five</td>
<td>The sound of the Hip Hop kit motif is changed through the use of different effects. The moonbeam sound is removed from the editor window.</td>
</tr>
<tr>
<td>Six</td>
<td>The Hip Hop Kit Bass motif is combined with the Moonbeam sound by accident.</td>
</tr>
</tbody>
</table>

The table shows that the development of the moonbeam motif happens primarily in the first and the last phases of the composition process. In the very first round of work, Casper experimented with the ‘hip hop kit’ sound and created what he referred to as a ‘bass-line’. At this moment in time, the musical structure and material was very far from the content of the final composition. However, the ‘hip hop kit’ bass-line was muted during the following rounds of work, until it was included again in a modulated version. The moonbeam sound was experimented with in the middle of the process. After that, the sound was not used in the following round of work. In the end, the moonbeam sound was combined with the recorded melody line, resulting in the moonbeam motif.
Accordingly, the moonbeam motif may be described as two elements, the melody and the sound, that lived two separate lives until they were united in the last phase of the composition. In the table below, I have tried to picture this development. The blue color represents the melody. The light blue color represents the muted melody. The yellow color represents the sound. The green color represents the union of blue and yellow, in other words, the union of melody and sound.

<table>
<thead>
<tr>
<th>Table 10.6 The union of sound and melody</th>
</tr>
</thead>
<tbody>
<tr>
<td>The sound</td>
</tr>
<tr>
<td>The melody</td>
</tr>
<tr>
<td>Round</td>
</tr>
</tbody>
</table>

In the following I will investigate in detail the two important moments in time that eventually resulted in the moonbeam motif.

10.3.3.2 The creation of the melody

In the first hour of the first round of work, Casper was working primarily on a piano theme, and a drum, and a bass, and a clap sound. He was using the MIDI keyboard a lot. Every time he recorded, he did a lot of editorial work afterwards because the recording was somehow out of sync. He tried to play and record different types of piano motifs, but he eventually deleted them. Subsequently he searched for a piano loop. He chose two piano loops, one of which played a major role in the composition. Besides, he tried out many different effects and sounds, including the ‘hip hop kit’ sound. He seemed frustrated and bewildered, searched in many directions, selected different drum-loops, recorded a handclap-sound, tried many different types of loops, saying to himself ‘this is not easy’, tried to improvise with a piano sound, combined a bass sound with the central piano theme without any obvious harmonic consistency, changed the tempo, changed it back again, moaned, stretched and said ‘autch’, recorded a drum with the MIDI piano, quantified the drum, etc. This is the moment were the rhythmical motif, later to become the moonbeam motif, starts to evolve:

*Casper has now been working for one hour and one minute. The sound Hip Hop Kit are chosen on track number two. He is playing a repetitive rhythmical figure on the MIDI keyboard. He is changing the sound. He is changing the sound to Dance Kit. He records*
a drum with Dance Kit [01:01:14]. He is editing the length of the recorded section. He listens. It sounds like it is out of sync. He stops. He quantifies into quarters. The notes are now off-beat. He is moving the section. The notes are now on-beat. He listens. He plays a double tempo on the MIDI piano. He opens up a new track. He selects a piano sound. He is improvising with the piano sound. He selects the Hip Hop Kit sound. He is playing a repetitive rhythmic motif with the sound. He records. Quantifies. Listens. Rewinds. Starts. Listens. Moves the recorded section. Starts. Listens. Stops. Rewinds. Starts. Listens. Stops. Shortens the section. Rewinds. Tries to shorten the section but is not able. Starts. Rewinds. Starts. Stops. Moans. Listens to track number two. Loops the recorded section on track number two [01:06:34]. Now the beginning of the section is on-beat but the looped part is off. He loops the recorded section on track number five. He listens. It sounds out of sync. He drums with his hands on the table. He changes track number two into Hip Hop Kit. He deletes the recorded section on track number five. He listens to track number two. He is playing a repetitive rhythmical figure with the sound of a clap. Starts the music. Listens again while playing the clap-sound [01:07:44]. He applies an effect. He edits the effect. Trying to change the effect but is not able. He says ‘why is this not possible’. [...] Casper is now working simultaneously on clap, beat, bass and piano for the next few minutes [01:14:08]. He tries to play a rhythmical bass drum figure combined with the recorded drum. It seems as if Casper is interpreting the off-beat drum as a drum on the beat, in the sense that he is now also playing the bass drum off-beat. He drums on the table [01:16:18]. He listens to the looped version of the recorded drum on track number two. It is very obvious – probably also to Casper – that the rhythm now changes in an inadequate way. Casper deletes the looped part of the section. Now the drum is on the beat in this section [01:18:22]. He loops the section again but now the rhythm doesn’t change [01:19:05]. He changes the quantification into eights. Now the rhythm is off-beat again and contains different rhythmical variations. The rhythmical motif, later to become the moonbeam motive is created [01:20:00]. He listens to the entire song and says ‘shit’. (Description of the video recording, 2013)

According to the description above, the rhythmical motif was formed through numerous actions and interactions between Casper and the software. The initial recording was modified through
quantification and effects, the sound changed many times, and the section shortened, extended, looped, and moved. Throughout the process, the motif changed character many times and in many ways. Thus, it seems like the final result was quite different from what Casper initially intended.

Let’s start with the beginning. First of all Casper recorded the music in a very atypical way. Casper did not listen to the tempo before he recorded the MIDI keyboard. He simply started recording at the same time as he started playing. Consequently, the recorded rhythm was often slightly out of sync. The same applied to the recorded drum, later to become the moonbeam motif. Initially this section seemed out of sync. But immediately Casper began to quantify the section.

Quantification of music is quite normal in a modern musical context (Jensen, 2001; Marstal & Jaeger, 2003). The point is that music, recorded with a MIDI piano, may be adjusted slightly in order to make it fit precisely into the metronomic system. Accordingly, you can play a sequence and afterwards modify it in order to make it fit the rhythmical structure. By quantifying the recorded section into semibreves, all the recorded notes will be placed on the first beat in every bar. By quantifying the recorded section into eights, the recorded notes will be placed on the nearest eight.

However, the problem is that if the recorded section is not very close to the metronomic structure, the result of quantification will sound strange, in the sense that the recorded notes will be moved to unintended places.

When Casper quantified the discussed section, the result was four off-beat notes in every bar. Subsequently, he moved the section, and the notes were on the beat. Several reasons imply that Casper preferred a motif to be on the beat. Firstly, he did not modify the rhythm immediately afterwards, indicating that he was provisionally satisfied. Secondly, it seems like Casper was trying to hit the beat when he recorded with the MIDI keyboard.

After fifteen minutes he looped the section. Again, it seems like Casper’s operations led to an unintended result. In general, when sections of music are being looped, it is necessary that the length of the initial section fits into a specific bar-structure. Otherwise, the looped sections will not fit into the musical structure in the same way as the original section. The length of Casper’s recorded motif did not fit into the specific structure. Consequently, the looped sections were suddenly off-beat, while the basic section was on the beat. Casper subsequently deleted the looped
sections, changed the length of the basic motif, looped again, and thereby managed to create a consistent loop on the beat. However, the minute after, Casper changed the quantification into eights, and the rhythmical motif was again off-beat. From there on, the rhythm didn’t change.

Several interesting points may be derived from the above: 1) The initial intention was changed through numerous experimentations. 2) The initial intention was changed through mistakes caused by lack of experience. 3) The problems that Casper encountered were caused by musical technical challenges as well as computer-based challenges. 4) Casper’s lack of musical competence influenced the process and outcome of the composition. Casper was frustrated by this. 5) Casper was not showing visible signs of satisfaction when he created what was later to become one of his most valuable musical details.

10.3.3.3 The combination of the sound and the melody
In the interview, Casper and I tried to capture why and how the sound and the melody were combined. The combination happened rather late in the process. Casper explained that it probably was an accident.

I don’t really remember what happened – I think I did it by accident – I moved the moon beam up there...and by accident I touched the play-button... and then I heard it... and then this thought occurred, ‘yes – I prefer this’. (Final interview with Casper, 2013)

There are several ways to interpret Casper’s formulation. Maybe he had simply forgotten what happened and what the intention was. Maybe the intention was not explicitly conscious. Maybe he had no intention of combining them but did it accidently. In the interview I instantly sought to get a confirmation of the last interpretation.

The interviewer: Thus, by accident you compose – no combine - the bass-melody you had recorded - the very thing you had recorded yourself - by accident you combine that with the moonbeam sound?
Casper: Yes
The interviewer: And it actually sounds good?
Casper: Yes – then I thought, ‘it sounds actually rather good’
In the following table the episode is described on a micro-level by the use of the video-recording. In the table, actions and behavior both inside and outside the computer screen are included. The left column represents the time. Thus, every box represents two seconds. Accordingly, it is possible to get a sense of how much time Casper spent on every action.

Table 10.7 The combination of the sound and the melody

<table>
<thead>
<tr>
<th>Time</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:46</td>
<td>He selects the moonbeam sound</td>
</tr>
<tr>
<td>6:48</td>
<td>He is playing the central motif in the composition with the moonbeam sound using the MIDI keyboard</td>
</tr>
<tr>
<td>6:50</td>
<td></td>
</tr>
<tr>
<td>6:52</td>
<td></td>
</tr>
<tr>
<td>6:54</td>
<td>He selects another sound than the moonbeam – but instantly selects the moonbeam again</td>
</tr>
<tr>
<td>6:56</td>
<td></td>
</tr>
<tr>
<td>6:58</td>
<td></td>
</tr>
<tr>
<td>7:00</td>
<td>He scrolls down and pushes the solo button so that you can only hear the recorded bass-line</td>
</tr>
<tr>
<td>7:02</td>
<td></td>
</tr>
<tr>
<td>7:04</td>
<td></td>
</tr>
<tr>
<td>7:06</td>
<td></td>
</tr>
<tr>
<td>7:08</td>
<td>He listens to one bar of the bass-line</td>
</tr>
<tr>
<td>7:10</td>
<td></td>
</tr>
<tr>
<td>7:12</td>
<td>He selects the moonbeam sound</td>
</tr>
<tr>
<td>7:14</td>
<td></td>
</tr>
<tr>
<td>7:16</td>
<td>He is pushing the play button</td>
</tr>
<tr>
<td>7:18</td>
<td>He plays the bass melody that is now combined with the moonbeam sound. He stops after a bar</td>
</tr>
<tr>
<td>7:20</td>
<td></td>
</tr>
<tr>
<td>7:22</td>
<td>He pushes the solo button – now all the tracks can be heard in combination.</td>
</tr>
<tr>
<td>7:24</td>
<td>He scrolls back to the beginning</td>
</tr>
<tr>
<td>7:26</td>
<td>He marks the ‘bass’ as the new software instrument (but he does not change away from the moonbeam sound – so he has not really made a change – maybe he is just checking something)</td>
</tr>
<tr>
<td>7:28</td>
<td></td>
</tr>
<tr>
<td>7:30</td>
<td></td>
</tr>
<tr>
<td>7:32</td>
<td>He starts the music</td>
</tr>
<tr>
<td>7:34</td>
<td></td>
</tr>
<tr>
<td>7:36</td>
<td>He stops immediately when the moonbeam motif begins</td>
</tr>
<tr>
<td>7:38</td>
<td>He selects ‘software instrument rediger’ for the moonbeam bass track</td>
</tr>
<tr>
<td>7:40</td>
<td>He turns turns off the EQ effect</td>
</tr>
<tr>
<td>7:42</td>
<td>He starts playing the music form the spot where he stopped before</td>
</tr>
<tr>
<td>7:44</td>
<td>He stops the music</td>
</tr>
<tr>
<td>Time</td>
<td>Event Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------------</td>
</tr>
<tr>
<td>7:46</td>
<td>He turns off effects</td>
</tr>
<tr>
<td>7:48</td>
<td>He starts the music from the spot where he just stopped before</td>
</tr>
<tr>
<td>7:50</td>
<td>While the music is playing he turns off three effects (you can’t really hear any difference)</td>
</tr>
<tr>
<td>7:52</td>
<td>While the music is playing he turns off three effects (you can’t really hear any difference)</td>
</tr>
<tr>
<td>7:54</td>
<td>While the music is playing he turns off three effects (you can’t really hear any difference)</td>
</tr>
<tr>
<td>7:56</td>
<td>While still playing the music he turns on two of the effects again (you still can’t really hear any difference)</td>
</tr>
<tr>
<td>7:58</td>
<td>While still playing the music he turns on two of the effects again (you still can’t really hear any difference)</td>
</tr>
<tr>
<td>8:00</td>
<td>While still playing the music he turns on two of the effects again (you still can’t really hear any difference)</td>
</tr>
<tr>
<td>8:02</td>
<td>While still playing the music he turns on two of the effects again (you still can’t really hear any difference)</td>
</tr>
<tr>
<td>8:04</td>
<td>While still playing the music he turns on two of the effects again (you still can’t really hear any difference)</td>
</tr>
<tr>
<td>8:06</td>
<td>While still playing the music he turns on two of the effects again (you still can’t really hear any difference)</td>
</tr>
<tr>
<td>8:08</td>
<td>While still playing the music he turns on two of the effects again (you still can’t really hear any difference)</td>
</tr>
<tr>
<td>8:10</td>
<td>While still playing the music he turns on two of the effects again (you still can’t really hear any difference)</td>
</tr>
<tr>
<td>8:12</td>
<td>While still playing the music he turns on two of the effects again (you still can’t really hear any difference)</td>
</tr>
<tr>
<td>8:14</td>
<td>While still playing the music he turns on two of the effects again (you still can’t really hear any difference)</td>
</tr>
<tr>
<td>8:16</td>
<td>He stops the music</td>
</tr>
<tr>
<td>8:18</td>
<td>He stops the music</td>
</tr>
<tr>
<td>8:20</td>
<td>He stops the music</td>
</tr>
<tr>
<td>8:22</td>
<td>For the first time he just looks at the screen without doing anything. He moans.</td>
</tr>
<tr>
<td>8:24</td>
<td>For the first time he just looks at the screen without doing anything. He moans.</td>
</tr>
<tr>
<td>8:26</td>
<td>For the first time he just looks at the screen without doing anything. He moans.</td>
</tr>
<tr>
<td>8:28</td>
<td>For the first time he just looks at the screen without doing anything. He moans.</td>
</tr>
<tr>
<td>8:30</td>
<td>For the first time he just looks at the screen without doing anything. He moans.</td>
</tr>
<tr>
<td>8:32</td>
<td>Casper says: ‘Why does that sound sounds so distorted’. Looks at the screen.</td>
</tr>
<tr>
<td>8:34</td>
<td>Casper says: ‘Why does that sound sounds so distorted’. Looks at the screen.</td>
</tr>
<tr>
<td>8:36</td>
<td>Casper says: ‘Why does that sound sounds so distorted’. Looks at the screen.</td>
</tr>
<tr>
<td>8:38</td>
<td>Casper says: ‘Why does that sound sounds so distorted’. Looks at the screen.</td>
</tr>
<tr>
<td>8:40</td>
<td>Casper says: ‘This is not working at all’</td>
</tr>
</tbody>
</table>

Bearing in mind Casper’s description of the ‘accident’, you would maybe expect Casper to make a more explicitly positive response to the sudden combination of the bass-melody and the moonbeam sound. However, Casper was apparently not completely satisfied. On the one hand, he did not split the bass-melody and the moonbeam sound again, which indicates that he actually see some potential in this new combination. Equally, he immediately tried out how the new combination sounds together with the rest of the music. On the other hand, he instantly sought to modulate the sound. He turned on different effects, turned them off again, etc. After working on this for 50 seconds he stopped, looked at the screen and spoke out loud, ‘why does that sound sounds so distorted?’, and after a short while, ‘this is not working at all’. Probably, Casper was trying to
remove a specific sound quality from the moonbeam sound, but had some problems reaching that goal. However, in the interview Casper didn’t mention this problem with the sound.

In general the video-recordings support Casper’s explanation of the process, in the sense that it may be interpreted as an accident (see table 10.7). However, it seems reasonable to suggest that such an accident doesn’t usually just happen out of nothing. A number of conditions facilitated the incident. First of all, Casper was working within a field where he was not competent: he does not know how to play music and he is not familiar with the specific musical software. This leads to a process characterized by exploration and minimal control, which seemingly promotes accidents. Second of all, the moonbeam motif was the result of Casper’s intentional choice. In other words, Casper chose to select and retain this musical variation (see Chapter Five, section 5.4). As Casper explained, the moonbeam sound was actually meant for something else. In other words, Casper was actually working with another strategy at the time. Still, he was able to pick up new ideas and change the plan.

10.3.4 The piano theme
In the final composition, Casper chose to play all the musical parts on the MIDI keyboard. The reason for this choice was apparently double. First, learning to play the MIDI keyboard represented a challenge to Casper. Secondly, Casper felt more like the genuine creator of the music if he himself played it. In other words, Casper was apparently addressing questions of autonomy as described in Chapter Nine.

> It is more myself. There a more of my own ‘touches’ in the music. Instead of just using the loops like, ‘it is perfect. It is easy’. When I have played it myself, it is mine. It is created by me. It has come out of my hands and my head. (Final interview with Casper, 2013)

As a central theme in the composition, Casper chose to imitate the piano theme from David Guetta’s She Wolf. As implied in the above, it was important to Casper that he learned how to play the piano theme himself. Accordingly, the rehearsal at the MIDI keyboard became an essential part of the composition process (see also Appendix G). However, the ambition resulted in some problems. Casper was not able to produce the exact theme that he has intended. Especially he
regreted a specific rhythmical instability at the end of the piano theme. According to Casper, he recorded it many times, still without success. Instead he tried to ‘close the gap’, as he describes it, by adding different kinds of effects and other instruments, including delay, reverb and strings. However, this only reduced the problem by ‘thirty percent maximum’, as he put it.

Casper’s explicit intention was to make the piano theme sound exactly like the original. Accordingly, it is possible to capture what went wrong in the process. Based on the video-recordings the problem seemed to be the result of at least three circumstances. First, Casper was recording readily without starting the metronome beforehand. Thus, Casper was recording without really being familiar with the tempo. This led to recordings that were simply out of sync. Secondly, Casper quantified the recordings afterwards, but as a consequence of the recording quality, the quantification only enhanced the problem. Thirdly, Casper, seemingly unintentionally, changed the rhythm of the bass and the drum so that it did not correspond the piano theme. Fourth, he designed the length of the recording so that it didn’t fit the length of the bars. Accordingly, when Casper looped the recorded piano, it didn’t fit the rest of the music.

Thus, it is obvious that the rhythmical problem was the result of a lack of traditional musical competence with regard to beat, bars, tempo, etc. In the screenshot below, the rhythmical problem is visible in the sense that the first chord is not placed on the first beat in the first bar, as it is supposed to be according to the original recording.

![Screenshot 10.12 The piano theme](image)

In the evaluation of Casper’s composition, the majority commented on the rhythmical instability that Casper regrets. In other words, it seems like the piano theme differs from musical norms in ways that the listener interprets as a kind of a mistake.
10.3.5 The evaluation group

The composition made by Jonas was assessed by evaluation group number one, two, three, four, and five (see next chapter). However, in this chapter I choose to focus qualitatively on the second evaluation group’s discussions. In general the evaluation group’s assessment of Casper’s music was more positive than the evaluation of Jonas’ music. However, that doesn’t apply to Mads’ evaluation, which was very negative. Thus, Nynne, Fie, and Louise graded Casper’s music more highly than Jonas’ on a scale of originality. Further, the three girls graded Casper’s music more positively than Jonas’ with respect to their final judgment (see table 10.8 below). Conversely, Fie and Mads graded Jonas’ music higher than Casper’s when it came to value/craftsmanship. Yet, conversely, Louise and Nynne graded Casper’s music more highly than Jonas’s music in terms of value/craftsmanship.

<table>
<thead>
<tr>
<th></th>
<th>Jonas</th>
<th>Louise</th>
<th>Fie</th>
<th>Nynne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Originality</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Value/craftsmanship</td>
<td>1</td>
<td>7</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Final judgment</td>
<td>1</td>
<td>6</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

According to the summary outlined in the above, it is interesting that the music in general was reviewed positively compared to Jonas’ music. Furthermore, it is interesting that Mads’ view departed quite severely from the others in the evaluation group. In the following I will investigate such issues from a qualitative point of view.

The group all agreed on one thing. Firstly, they were all very happy with the piano theme at the beginning of the composition. Secondly, they all noticed some rhythmical problems in this piano theme which became very visible when the piano was eventually combined with the beat. This rhythmical instability was apparently the same as that which Casper regreted (see above, section 10.3.4).

*Nynne:* It was like out of sync or something.

*Fie:* It was like it came a bar to late.

*Mads:* It didn’t really fit. It was not tight.
**Nynne**: It was like [Nynne jumps on the chair] it dropped down – it is like something I could have done.

**Mads**: I think the beginning was so great, but then... [...] It was like it came a bar too late. Like a film that doesn’t match the sound.

**Fie**: It didn’t really sound like a mistake.

**Mads**: No, because it was consequent.

**Fie**: Yes [...] it was irritating that it didn’t fit. [...] 

**Mads**: It was good in the beginning, but it was really bad that it did not fit the beat. It was badly cut.

**Fie**: There is something in the piano piece that is very irritating because it doesn’t hit spot-on like it should.

**Jonas**: The beats are great and the piano is great but they don’t fit together.

In the discussion it became a central theme whether or not the rhythmical instability was a mistake or not. In the questionnaire the members of the evaluation group wrote phrases such as ‘piano mistake’, ‘incoherent’, ‘not rhythmical’, and ‘piano plays too late or do not fall the right place’. Accordingly, the detail was partly defined as a mistake. This is important, in terms of the evaluation of the music. Thus, Nynne stressed that she granted the composition seven points, provided that the detail was intended and not a mistake. If the detail actually was a mistake she would have given the music only three points. Accordingly, whether or not something is intended does play a major role in interpretation, at least in this case. However, the other members of the evaluation group were not ready to change their decision in terms of points given. As Mads put it ‘if it is a mistake, it is just a matter of incompetence – if it’s not a mistake, it’s just stupid’.

In general it is obvious to suggest that Mads’ negative evaluation of Casper’s music was partly related to his musical expertise. Mads repeated many times that the rhythmical instability in Casper’s music was catastrophic. Further, he shook his head resignedly many times during the second playback. In the evaluation of Casper’s music, Mads underlined that ‘the music tries to sound like something it isn’t’. The same theme was addressed by Mads in regard to the evaluation of Jonas’ music. Apparently, questions of authenticity play a major role in Mads’ approach to music. Mads used phrases like ‘it sounds like electro-light’, stressing that the music was intended to sound like electro-music, but didn’t.
According to Mads, Casper’s music ‘sounds like a beautiful love-song in the beginning, but is subsequently ruined by the attempt to make it ‘electro-like’. Mads elaborated his argument by referring to an original Bryan Adams song, which was subsequently mixed into some dance-music. According to Mads, this strategy is damaging in the sense that it results in a mix that does not belong to any genre or tradition. However, Fie argued that Mads misunderstands the genre of electro-music and that Casper’s music actually adopts the codes from the electronic genre quite successfully.

According to the above, the interpretation and evaluation of the music is continuously related to notions about the composer’s intentions and the proper rules and codes within a domain. In that respect, the experienced musician Mads seemed to be the one who most explicitly addressed such issues. Thus, Mads apparently judged the music according to notions about what is allowed and what is not allowed according to specific traditions. I will further investigate this issue in the following chapters.

10.3.6 Final remarks
Casper’s way of working seemed partly blind in the sense that he did not follow specific strategies in the same way as Jonas did. Instead, the process seemed much more coincidental. Further, Casper’s way of working was mostly explorative.

The interaction between Casper and the technology might be described as a constellation, in the sense that Casper was interacting with the software (see Chapter Nine, section 9.4.2). Accordingly, Casper was frequently pushed in new directions as a result.

In Casper’s case, lack of expertise seemed to promote novelty instead of appropriateness. Most importantly, different sounds and rhythms were combined by accident or by coincidence. This might be interpreted as a remote association resulting in something novel. However, Casper’s lack of competence also resulted in limited appropriateness. From Casper’s point of view, this lack of craftsmanship was regrettable; especially in the cases where he had to give up master-plans as a result of lack of experience. The interpretation of craftsmanship and originality was supported by the assessment conducted by the evaluation group.
10.4 The two case studies: conclusive remarks

The results of the analysis of the two case studies are summarized in the table below. In terms of the evaluation, there are no straight-forward correspondances between the composers’ evaluations of the work and the assessment conducted by the evaluation group. However, obvious breaks with musical norms are underlined by the composers as well as the evaluation group. In general, the question of the composers’ intentions plays a key role in terms of how the music was valued.

<table>
<thead>
<tr>
<th>Table 10.9 Jonas and Casper compared</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explorative work contra plans and strategy</strong></td>
</tr>
<tr>
<td>Is adopting a specific musical form and a specific genre from the very start of the process</td>
</tr>
<tr>
<td><strong>Genre and traditions</strong></td>
</tr>
<tr>
<td><strong>Rules and craftsmanship</strong></td>
</tr>
<tr>
<td><strong>Installation or constellation</strong></td>
</tr>
<tr>
<td><strong>Coincident and mistakes</strong></td>
</tr>
<tr>
<td><strong>Vertical or horizontal</strong></td>
</tr>
<tr>
<td><strong>Value and originality</strong></td>
</tr>
</tbody>
</table>
Chapter Eleven: Fifteen case studies

11.1 *Introduction: is this a quantitative investigation?*

In this chapter the aim is to explore the general implications of the case studies in the third phase. In other words, the purpose is to find some general trends in the material. That is a dangerous road, because it indicates that there exists a simple or basic causal relation between expertise and creativity. It is not the intention to claim that. On the other hand, it seems reasonable to ask whether the case studies indicate some sort of pattern that might be relevant on a more general level. However, what constitutes a trend is something of a methodological problem. First of all, looking for trends may be more appropriate in truly quantitative studies (see for example Vaus, 2008, pp. 256-257). Secondly, it might be problematic in a basically qualitative study to decide what defines a trend.

I discussed this very dilemma with Professor Sonya Livingstone in a masterclass held at SDU (23. May, 2013). According to her, looking for general trends in qualitative case studies is perfectly reasonable. However, in her opinion, many qualitative researchers make the mistake of assuming that a trend has to be reflected in every single case of the investigation. From a quantitative point of view that is unreasonable, in the sense that a trend naturally doesn’t have to apply to every case. For instance, men are in general taller than women, but that doesn’t mean that every man is taller than every woman. Accordingly, a trend might be advocated in a qualitative study as well as in a quantitative study, even though the trend doesn’t appear in every case.

Thus, in the following, the aim is look for general patterns in the material and, equally, to emphasize where no patterns are found. The point of departure in this chapter are the iterative circles of analysis done so far, including the analysis of the case studies in the first and second phases of the study (see Appendix J). Thus, one of the important issues addressed in this chapter is how the findings developed so far apply to the total number of cases conducted in the third phase. However, it should be noted that Casper and Jonas are part of the case studies in the third phase. Accordingly, the chapter also includes references to the two cases discussed in the previous chapter.
The chapter mirrors the structure of the previous chapter. Thus, firstly, the final compositions are discussed. Secondly, the processes of composition are analyzed. Thirdly, I examine the processes that result in the musical elements that the composers highlight as the most successful. Finally, the assessment done by the evaluation groups is addressed systematically.

### 11.2 The participants

As described in the very first chapter the participants recruited in the final case study were divided into three groups, the novices, the experienced, and the experts. This distinction was simply based on the amount of experience that the participants possessed. In the following table, the participants’ background and musical preferences are briefly presented. The first five rows represent novices (white color). The next six rows represent experienced (light gray color). The final four rows represent experts (dark gray color).

<table>
<thead>
<tr>
<th>Table 11.1 The participants and their musical experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>Katrine</td>
</tr>
<tr>
<td>Trine</td>
</tr>
<tr>
<td>Steffen</td>
</tr>
<tr>
<td>Casper</td>
</tr>
<tr>
<td>Julie</td>
</tr>
<tr>
<td>Emil</td>
</tr>
<tr>
<td>Jonas (Vig)</td>
</tr>
<tr>
<td>Christian</td>
</tr>
</tbody>
</table>

223
<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Playing</th>
<th>Level</th>
<th>School</th>
<th>Musical Preferences</th>
<th>Family Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laura</td>
<td>22</td>
<td>Piano: 5 years</td>
<td>level A</td>
<td>School of Music, Vig</td>
<td>Jeff Buckley, Susanne Sundfør, CocoRosie</td>
<td>Nothing significant</td>
</tr>
<tr>
<td>Martin</td>
<td>19</td>
<td>Guitar: 6 years</td>
<td></td>
<td>School of Music, Vig</td>
<td>The Beatles, Bob Dylan, Bruce Springsteen, Pulp.</td>
<td>Mom and sister sing in choirs</td>
</tr>
<tr>
<td>Mikkel</td>
<td>22</td>
<td>Violin: 2 years, Guitar: 10 years</td>
<td></td>
<td>Social Education, UCSJ</td>
<td>Blues, Jazz, Techno, Gorillaz, Massive Attack, Joe Satriani</td>
<td>Mom and both brothers play instruments</td>
</tr>
<tr>
<td>Henrik</td>
<td>24</td>
<td>Computermusic: 8 years, Piano: 4 years, Guitar: 7 years, Drums: 7 years</td>
<td>Social Education, UCSJ</td>
<td>Electronic music, Heavy Metal, Metalcore, Melodic Heavy Metal, rock from the seventies, Avicii, Culture Beat, Electric Light Orchestra, Haddaway, Black Sabatth, and The Who.</td>
<td>Both parents play the piano</td>
<td></td>
</tr>
<tr>
<td>Cecilie</td>
<td>22</td>
<td>Piano: 15 years, Gymnasium music-level A</td>
<td></td>
<td>School of Music, Vig</td>
<td>Bill Evans, Esperanza Spalding, Thomas Dybdahl, Jarle Bernhoft. Faure’s requiem, Debussy.</td>
<td>Father plays the flute in classical orchestra. Elder sister plays piano.</td>
</tr>
<tr>
<td>Kristian</td>
<td>23</td>
<td>Piano: 15 years</td>
<td></td>
<td>The Royal Academy of Music</td>
<td>Many different genres, Jazz, Pop, Electro, Aleatoric Music, Steve Reich,Stockhausen</td>
<td>Elder brother is a teacher at the Royal Academy of music. Sister is a singer and a student at the royal Academy of Music.</td>
</tr>
</tbody>
</table>

### 11.3 An initial remark: the adoption of instruments

As discussed in Chapter Nine, the novices apply loops first and foremost (except for Casper, see previous chapter), whereas the experienced and the experts first and foremost record the music themselves, by audio or MIDI recording. The different procedures seem to be related to the characteristics of the final compositions, as I will demonstrate in the following sections. However, the question is how such relations must be interpreted. From an ANT perspective, the material applied in the process of composition will severely affect the outcome. The musical instruments or the computer are not only tools, they are actors influencing the process. From a perspective of affordance, the same argument may be applied (see Chapter Six, section 6.5.1 and Chapter Nine, section 9.4). Thus, one might suggest that the different outcomes are caused by the different non-human actors involved. On the other hand, it would be unreasonable, also from an ANT perspective, to forget the human actor, that is, the composer. The composer chooses to do
something that is not predetermined by the non-human actors. Thus, the human will, reflections, competences, and aims naturally influence the outcome very much (see also Chapter Nine section 9.3 and section 9.4). The balance and interaction between human and non-human represents a key issue in this chapter.

### 11.4 The product: structure, form and genre

The analysis of the musical structure, form, and genre is based on (1) the composer’s own description, (2) the description of the evaluation groups, (3) and finally my own description based on an analysis of the music. Naturally, there might be inconsistency between these different approaches. Further, there might be internal disagreement in the evaluation groups. Such differences will be emphasized in the following if they are considered important.

In the two tables below, the description of the music is shortly summed up. In the first table, a general description of the music, done by the composer, the evaluation group, and me, is presented.

<table>
<thead>
<tr>
<th>Table 11.2 The compositions according to the composers, the evaluation group and me</th>
</tr>
</thead>
<tbody>
<tr>
<td>The music described by the composers</td>
</tr>
<tr>
<td>Katrine</td>
</tr>
<tr>
<td>Trine</td>
</tr>
<tr>
<td>Steffen</td>
</tr>
<tr>
<td>Casper</td>
</tr>
<tr>
<td>Julie</td>
</tr>
<tr>
<td>Emil</td>
</tr>
<tr>
<td>Jonas (Vig)</td>
</tr>
<tr>
<td>Christian</td>
</tr>
<tr>
<td>Laura</td>
</tr>
<tr>
<td>Martin</td>
</tr>
<tr>
<td>Mikkel</td>
</tr>
<tr>
<td>Henrik</td>
</tr>
<tr>
<td>Jonas</td>
</tr>
<tr>
<td>Cecilie</td>
</tr>
<tr>
<td>Kristian</td>
</tr>
</tbody>
</table>
The next table presents a description of the different compositions according to musical layers/tracks, sounds, instruments, form, and musical material. The table is based on my own analysis of the music and contains, apart from my identification of the musical form, informations that may be considered rather objective from a positivist point of view.

<table>
<thead>
<tr>
<th>Table 11.3 The compositions: a short characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of tracks</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Katrine</td>
</tr>
<tr>
<td>Trine</td>
</tr>
<tr>
<td>Steffen</td>
</tr>
<tr>
<td>Casper</td>
</tr>
<tr>
<td>Julie</td>
</tr>
<tr>
<td>Emil</td>
</tr>
<tr>
<td>Jonas (Vig)</td>
</tr>
<tr>
<td>Christian</td>
</tr>
<tr>
<td>Laura</td>
</tr>
<tr>
<td>Martin</td>
</tr>
<tr>
<td>Mikkel</td>
</tr>
<tr>
<td>Henrik</td>
</tr>
<tr>
<td>Jonas</td>
</tr>
<tr>
<td>Ceclie</td>
</tr>
<tr>
<td>Kristian</td>
</tr>
</tbody>
</table>
11.4.1 The genre

One of the main hypotheses addressed in the thesis is that the experts follow norms according to specific musical traditions and genres, whereas the novices are less likely to follow such norms and rules. This picture is partly reinforced through the analysis of the case studies of the third phase. Among the experienced and the experts there are several examples of genre-specific compositions. Martin composed a well-defined country song in which the instruments applied resembled a traditional country band. From the very beginning he declared that he intended to compose a country song and in the evaluation group there were apparently no doubts that this song belonged to the genre of country (see table 11.2 above). The same tendency applied to Christian, Jonas (Vig), Cecilie, and Henrik (see table 11.2).

Among the novices the genres are less easy to define. Julie and Steffen both declared initially that they intended to make ‘a mix of many genres’. Likewise, the music composed by Katrine and Trine was apparently not easy to define for the evaluation group (see table 11.3). However, the music composed by some of the experienced participants was also described in ambiguous terms by the evaluation group. Accordingly, some listeners described Emil’s music as a ‘mix of many styles’.

Finally, there is also one clear example of disagreement between me, the composer, and the evaluation group in terms of how the music must be interpreted: the expert Kristian described how his composition was inspired by people like Steve Reich and John Cage. Nonetheless, in the evaluation group such musical references were not noticed. Accordingly, in Kristian’s view, the genre of the composition was somewhat clearer than it was according to the evaluation group. Despite such disagreements, I have tried to sum up the clarity of genre based on the different perspectives included (see table 11.4 below). In the table, Kristian’s composition is placed in the category ‘somewhere in between’, partly because he did not explicitly describe the music as belonging to a specific genre and partly because the evaluation group did not consider the music as part of a specific genre.

| Table 11.4 Clearness of genre: according to the composer, the evaluation group, and myself |
|-----------------------------------------------|-------------------------------|-------------------------------|
| Clear genre                                  | Novice                        | Experienced                   | Expert                        |
| Clear genre                                  | Martin, Christian             | Jonas, Cecilie, Henrik        |
| Somewhere in between                         | Casper, Katrine               | Jonas, Emil, Laura Mikkel     | Kristian                      |
| Not clear genre                              | Julie, Steffen, Trine         |                               |                               |

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11.4.2 Form and structure

The distinctions between novices and experts are even more explicit when considering musical form and structure. Thus, the experienced and the experts were apparently following specific traditional musical forms. Laura, Martin, Christian, Jonas, and Jonas (Vig) were composing music that included common musical norms within popular music, including well-defined musical sections, verses and choruses, and a clear focus on the horizontal melodic structure (see table 11.2). Equally, Cecilie followed musical norms typical of baroque music, such as well-defined sections and harmonic sequences. These well-defined structuring principles are also evident when looking at the composer’s own drawings and descriptions of the musical form (see drawings 11.1 below, from the left, Christian, Laura, Martin, and Cecilie). Thus, Christian described the form as something like intro-A-B-C-B-outro; Laura describes her music as following an A-B-A form; Martin divides his music into the sections of intro-A-bridge-B-A-bridge-B-C-solo-A-bridge-B-C; and Cecilie describes the music according to an A-B-A form.

![Drawings 11.1 Musical form according to Christian, Laura, Martin, and Cecilie](image)

The well-defined sectional structure appears to be further reinforced when examining the screenshots of the participant’s final compositions (see below, from the left, Christian, Laura, Martin, Cecilie, and Kristian). Thus, the screenshots reveal that the music is typically divided into different sections that are repeated several times throughout the composition according to common musical norms (see Chapter Eight, section 8.5).
Conversely, the music composed by novices seems less well-defined in terms of form. Most of the novices simply resisted describing a form because they didn’t see a form. The music as it appears in GarageBand supports this description. Evidently, the music did not follow common sectional principles in terms of form. On the other hand, the music did not follow repetitive principles either in the sense that the composition consisted of a comprehensive amount of repetitions of the same bar (see Chapter Eight, section 8.5). Some of the most evident characteristics were; (1) many different loops applied; (2) the loops were not repeated more than two or three times and often they were not repeated at all; (3) the music was constantly developing and not returning to previously introduced motifs, etc. In the screenshots 11.2 below this is evident (from the left, Julie, Trine and Steffen – Steffen’s music is divided into two screenshots because of the many loops applied).

Steffen’s composition may be taken as an example of the characteristics described in the above. Steffen described his music as ‘a trip around the world’. The music falls into many sections that are rather different. The different sections fade in and out, somewhat resembling the work of a DJ in the sense that seemingly different types of musical material are placed sequentially. According to Steffen the idea of making ‘a trip around the world’ represents the basic structuring principle in the
song. The result is obviously very fragmented. This musical strategy is similar to many of the case studies conducted with other musical novices. For example, two girls from the Little School of Holbæk composed a song they called *Jumping from island to island* (second phase of the case studies, 2012). And two boys from the fifth grade at the School of Tuse composed a song called *Journey to China, Africa, and India* (field study, 2012).

However, the clear division between novices and experts was also challenged. Mikkel composed music that was less well defined with respect to form. He called his music, *A Number of Thoughts and Ideas*. The composition consisted of four different parts that succeeded each other. In his own interpretation, this was described as an A-B-C-A form (see drawing 11.2 and screenshot 11.3 below) (in my own analysis of the music I interpret the composition as an A-B-C-D-A form, see table 11.3 - however, that’s a minor inconsistency that makes no difference in terms of the questions addressed here). Although the music didn’t follow a clear sectional form there were still sectional elements present in the sense that the composition finished with a repetition of the first part of the song. Further, the title, *A Number of Thoughts and Ideas* indicates that the music may not have been considered a finished piece of work.

![Drawing 11.2 and screenshot 11.3 Mikkel’s composition](image)

Emil’s composition represents equally some ambiguity (see drawing 11.3 and screenshot 11.4 below). Emil’s musical piece was not strictly sectional, in the sense that he did not divide his music into sections that corresponded with a typical number of bars within rhythmic music (sections of the length of four, eight, sixteen, and thirty-two bars) and he did not return to a section throughout the composition. On the other hand, he divided the music into three parts that were instead related in terms of the melodic and rhythmic material applied. Further, the music relied on strict repetitive elements in terms of rhythm and harmony.
Among the novices, it is also possible to find cases that might challenge the general picture outlined. Katrine composed a piece of music that didn’t rely on a strict sectional form but still incorporated some repetitions of a specific melodic material (see screenshot 11.5 below). Further, there were clear repetitive elements in the composition. The same applies to Casper’s composition as described in the previous chapter.

I have tried to sum up the clarity of form based on the discussions above. Even though the general picture I have presented might be challenged, it seems reasonable to suggest that musical form is apparently related to levels of expertise.

<table>
<thead>
<tr>
<th>Table 11.5 Clarenss of form</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Novice</strong></td>
</tr>
<tr>
<td>Clear structure</td>
</tr>
<tr>
<td>Somwere in between</td>
</tr>
<tr>
<td>Not clear structure</td>
</tr>
</tbody>
</table>
11.4.3 The musical tracks

One of the findings in the case studies from the first phase was that novices usually incorporate many musical tracks/layers compared to the experts (Boysen, 2010b). However, according to table 11.3, such a trend in not visible in the case studies of the third phase. Kristian, Casper, and Jonas only applied five layers, whereas Mikkel and Steffen employed fourteen and seventeen layers respectively. Thus, there is seemingly no connection between the number of layers and the level of experience. Nevertheless, there is a clear connection between the sort of layers applied and the level of expertise. Most of the novices incorporated layers that consisted of loops containing many sounds and instruments (except for Casper, see Chapter Ten). Conversely, the more experienced participants primarily recorded instruments themselves, using either MIDI or audio recording. Thus, most of the layers applied by the experts only contain a single instrument.

This outlined difference results in very different musical outcomes. Firstly, the musical texture in the novices’ compositions was very dense, complex, and compacted, whereas the music composed by the experienced and experts was less dense, and first and foremost resembles a traditional instrumental ensemble in which it is possible to identify the different instruments. Secondly, the novices’ compositions were more eclectic in the sense that a huge amount of instruments and sounds derived from different musical traditions were incorporated. Accordingly, they seemed to be influenced by the GarageBand affordances, as described in Chapters Eight, section 8.3, 8.4 and 8.5, and Chapter Nine, section 9.4.

11.4.4 To make the music sound like a real orchestra

Among the experts and the experienced it is a somewhat usual procedure to attempt a simulation of a live orchestra. Cecilie adopted the model of a traditional classic orchestra, including strings, obo, flute etc. Martin put in drum fills in order to make the music sound ‘a bit like it is played by a real drummer’. In other words, he used the same technique as Jonas did, as described in the previous chapter (see also Appendix H). Christian described how he usually composes music on the computer in a way that fits a real orchestra. Jonas (Vig) described how he placed the instruments on different tracks in order to simulate a score meant for a real orchestra. Mikkel tried to simulate a jazz orchestra. Conversely, the novices, Julie, Stephan, Casper, and Katrine, made no implicit or explicit attempt to make the music sound like a real orchestra (see table 11.6 below).
Table 11.6 Simulation of an orchestra

<table>
<thead>
<tr>
<th></th>
<th>Novice</th>
<th>Experienced</th>
<th>Experts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real orchestra</td>
<td>Trine</td>
<td>Martin, Christian, Mikkel</td>
<td>Cecilie, Jonas</td>
</tr>
<tr>
<td>Something in between</td>
<td>Laura, Emil, Jonas</td>
<td></td>
<td>Kristian</td>
</tr>
<tr>
<td>Not a real orchestra</td>
<td>Julie, Stephan, Casper, Katrine</td>
<td></td>
<td>Henrik</td>
</tr>
</tbody>
</table>

However, it should be noted that sounds of instruments might be applied without the intention of simulating a traditional orchestra or ensemble. Thus, in the case of Henrik, sounds of traditional instruments were applied, but according to Henrik the instruments were not meant to sound as if they are played by an instrumentalist:

*Henrik:* I thought, I want to use a piano, because I like the sound of piano. I do not know how to play it myself but...And naturally it doesn’t sound like it’s more like...some kind of electronic piano thing...You know, if you played piano for real, it obviously doesn’t sound anything like this. But I had a pretty good idea about how I wanted it to sound.

The interviewer: Would it be better, if it had been a real piano?

*Henrik:* Not the sound itself. It is more like, the way it’s played. Well, I do not suspect anyone would play like this on a real piano. [he laughs]. The interviewer: But do you think that [the electronic piano] is a bad thing?

*Henrik:* No – just different. (Final interview with Henrik, 2013)

Henrik is an expert both with regard to computer-music and musical instruments (see table 11.1). However, most of the music he has composed in the past is computer-based. In other words, computer-music is his domain rather than ensemble play. Therefore, it seems reasonable to argue that Henrik was not trying to install the codes and procedures from ensemble playing into the domain of computer-music, because he normally works with this type of technology.

In Chapters Nine and Ten, I argued that simulation of an ensemble might be understood as an installation. The point is that the composers have an explicit notion about how the music must sound and they try to use the software to materialize that vision regardless of the softwares properties and potential. As described in the above, many of the experienced players and experts
followed this strategy. Conversely, the novices’ work may be described as a constellation, in the sense that they explored and used the potential of the software. However, installation and constellation is not only a question of simulation or otherwise. In general these concepts refer to the dynamic between the creator’s intention and the properties of the material. In the following sections, these types of processes will be investigated.

11.4.5 Summing up

- The experts and the experienced record the music using audio recording or MIDI recording. The novices apply loops.
- The music composed by experts and experienced players is more genre-specific than the music composed by novices.
- The music composed by novices is more fragmented and eclectic than the music composed by the experts and the experienced.
- The music composed by experts and experienced players relies more on sectional as well as repetitive musical principles than the music composed by novices.
- The experts and the experienced implement and refer to specific musical forms. The novices do not refer to such forms to the same degree.
- The experts and the experienced are apparently using musical forms as a way to predict or plan the composition. The novices do not rely on such plans. Instead, they invent other plans that seem less specific and traditional, but nevertheless exist.

11.5 The process

The analysis of the process is based on the saved GarageBand files, the video-observations, and the interviews. The analysis is triangulated in the sense that different types of empirical material are investigated throughout the analysis. Even so, in the below, the GarageBand files are used mainly to examine the process on a macro-scale, whereas the video-observations are used primarily to investigate the process on a micro-scale. The interviews are utilised throughout the analysis.
11.5.1 The process from a macro perspective

In the following, the point is to investigate how the compositions developed. Did the composers follow a specific plan? Did they moving in a specific direction or did they make false starts and detours? Did they have a master-plan or not?

11.5.1.1 The composition step-by-step

In the former chapter I argued that Jonas’ working process seemed somewhat straightforward compared to Casper’s. The question is whether this mirrors some general differences between experts and novices. The implications of the GarageBand files are inconclusive. First of all, it is important to note that most of the compositions accumulated straight forwardly from session to session, on a vertical as well as a horizontal level (see Appendix D). Of course this might be related to the fact that the participants only worked for approximately ten hours on the composition, which might reduce the room for detours, revisions, and false starts. However, there were also exceptions.

The novice Trine worked for four days on her composition. Every single day, she started all over again. According to Trine there were several reasons for that. First of all, she managed in the second session to make something that she liked. However, she was not able to finish the composition, because she ‘cannot find anything equally good’ (final interview, Trine, 2013). Trine kept emphasising that she ‘doesn’t think’ she ‘just do something’, and when she thought, ‘everything stops’. In the final interview, she chose the music made on the second day, not the last.

Another exception is Martin who worked with some specific harmonies in the very first session, but discarded the idea after 20 minutes. Besides, Julie explained that she felt like starting all over again in the final stage of the composition process, because she suddenly found a sound she really liked:
‘when I found that sound I felt like deleting it all and start all over again with this sound as the starting point’ (final interview, Julie, 2013).

11.5.1.2 Different types of development

Even though the compositions in most cases expanded on a regular basis from one round to the next, there seems to be a significant difference between the content of that expansion. Among the novices, the composition typically moved in a new direction from round to round (e.g., Steffen and Julie). In other words, from a musical point of view, it was mainly new musical material that was incorporated every time they worked on their composition. Thus, it seems like the novices did not have a specific master-plan. This suggestion is supported by the interviews in which Trine, Julie and Katrine state that they did not have a plan. On the contrary, most of the experienced and the experts continued the work straightforwardly and linearly from round to round. In other words, they were working on and elaborating the same musical material.

However, there were also exceptions. The novice Casper was working basically with the same musical material throughout the sessions (see the previous chapter). Furthermore, the experienced participant, Mikkel, was seemingly moving in a new direction every time he worked with the composition. However, Mikkel explained in the interview that his initial intention was to compose a melody that he would orchestrate in different styles. But when he realised that he didn’t really possess the adequate competence, he changed the strategy. Accordingly, his initial strategy was to follow a specific plan.

11.5.2 The process from a micro-perspective

In the following, the video-observation will be used in order to explore how the novices, experienced players, and experts generate musical ideas and produce music on a micro-scale. When doing so, a number of differences seem to be evident. These differences are indicated in table 11.7 below.
Table 11.7 Different strategies when working in order to generate ideas

<table>
<thead>
<tr>
<th>Novices</th>
<th>Experts and experienced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply loops</td>
<td>Apply instruments</td>
</tr>
<tr>
<td>Combining sounds</td>
<td>Generating sounds</td>
</tr>
<tr>
<td>Listening and putting things together</td>
<td>Listening and playing</td>
</tr>
<tr>
<td>Action and listening is separated</td>
<td>Action and listening happens simultaneously</td>
</tr>
<tr>
<td>Using partly well-known harmonies</td>
<td>Using well-known harmonies</td>
</tr>
<tr>
<td>Not improvising but applying specific scales</td>
<td>Improvising and applying specific scales</td>
</tr>
<tr>
<td>Using partly well-known forms and structures</td>
<td>Using well-known structures and forms</td>
</tr>
<tr>
<td>Mixing many different genres, instruments and sound-effects</td>
<td>Improvising according to a specific genre and tradition</td>
</tr>
<tr>
<td>Combining many layers, each of which contains many instruments</td>
<td>Combining layers, each of which contains only one instrument</td>
</tr>
</tbody>
</table>

I will argue that the differences depicted in the table above are related to questions of control, autonomy, and explorative processes. In other words, the experts and the experienced seemed to be in control of the process. The novices did not seem to be in control of the equipment and the situation. The novices work was first and foremost explorative.

11.5.2.1 Experienced and experts: Adopting instruments

All the experts, except for Henrik, applied traditional instruments in the process of generating new ideas. Conversely, the novices were exclusively using the loops offered by the software, except for Steffen who managed to produce a two-bar long intro on the MIDI keyboard (and Casper as discussed in the previous chapter). Thus, playing a musical instrument became a crucial part of the composition process among the experienced and the experts. This method seems to entail, or be related to, a number of other significant characteristics, typical of the work of the experienced/experts when they generated ideas.

As indicated in table 11.7, the experienced/experts were adopting a specific musical tradition when they improvised (see, for example, the movies on YouTube with Martin, https://youtu.be/U137EJL5TZE, Cecilie, https://www.youtube.com/watch?v=GwmEckLOoI8, and Christian, http://youtu.be/Fr-vjN20luI). For example, when Cecilie improvised and composed, she was obviously trying out different notes and melodic phrases. However, the notes all belonged to a specific scale (see also Chapter Six, section 6.6). The same applies to Jonas, Christian, Kristian, Martin and Laura etc. The perspective is supported by the interviews, such as when Laura explained...
that she ‘experiments with the notes that fit into the harmonies’ (see Appendix E). Accordingly, there seems to be a connection between the adoption of an instrument and the adoption of musical traditions. However, there are also examples of the opposite: Martin applied a specific, self-developed technique, in order to find surprising harmonic connections:

\[ I \text{ like to use many harmonies. This is what I normally do when I make songs. I just sing and play and try to change harmonies coincidentally.} \]  

(Interview with Martin, 2014)

According to Martin, this procedure resulted in a partial break with musical norms in his composition: ‘The kind of shift between chords is unusual within the genre of country music’ (interview with Martin, 2014). In the video-observation it is possible to follow Martin’s experimentation with unusual shifts between chords (see video on YouTube, https://youtu.be/U137EJL5TZE). Martin wrote down this apparently unusual harmonic sequence on a piece of paper (see drawing 11.4 below).

![Drawing 11.4 An unusual harmonic shift according to Martin](image)

Nevertheless, in general the experienced/experts seemed to follow specific musical norms when they generated musical ideas. Conversely, the novices broke with musical norms on a regular basis: Julie put all kinds of musical material together. Based on the video-observation it is possible to see just how many experiments she made that seem to be rather blind (see section 11.5.2.2 below). Of course, musical norms might not be broken in the sense that GarageBand is designed in a way that facilitates the reinforcement of musical norms (see Chapters Eight and Nine). So even though Julie’s experimentation seemed blind it was also to a certain degree a sighted process because of the non-human actor involved. Still, it is partly possible to break norms in terms of genre, form, structure, and harmony when using GarageBand. Accordingly, even though the loops are part of the same key, it is still possible to combine loops in a way that results in bitonality (see, for example, video-recording with Steffen on YouTube, http://youtu.be/BzaZbBfBhUE).
The adoption of musical norms might also be related to the role of the body. In Chapter Six, the internalization and automation of musical rules and norms were discussed. In that respect, the experienced/experts in this inquiry often referred to ‘intuition’. Furthermore, they used phrases like, ‘my hands are doing something’, ‘it is better not to think’, etc. Thus, it was implied that their hands worked somewhat independently of reflective thinking. According to Schön and his discussion of expertise, such actions might involve a significant proportion of ‘knowing-in-action’. In other words, when the hands are working on their own it might be reasonable to suggest that rules and norms are partly adopted automatically. This might also be a bold conclusion because it indicates that the hands are less able to promote development. Consequently, the typical hierarchy between mind and hand, that Sennett and Schön among others try to eliminate, is reinforced. I will return to this discussion in Chapter Twelve.

11.5.2.2 The novices: working with loops

Another general difference between the two ways of generating ideas is the relation between listening and action. When the experts played on an instrument in order to generate ideas, they were listening and acting simultaneously. Conversely, the novices separated action from listening when they used the computer to combine loops. Hence the first method could be seen as reflection-in-action whereas the second could be interpreted as reflection-on-action (see also Folkestad, 1996 p. 140). The question is how this difference affects the process of composition. First of all, it is a matter of feedback. The musician who plays an instrument will get immediately feedback. Conversely, when applying loops, the feedback happens a while after the action.

According to Sennett’s interpretation of the craftsman, the hand and mind are inseparable (Chapter Six, section 6.5.1). Thus, the hands act on the basis of constant feedback from the material. If the material is acting in an unforeseen way, the creator can change the action accordingly without the need for deliberate or reflexive thinking. However, without this constant feedback, the action results in an outcome that is less predictable and less controlled. When Julie puts three loops together and presses play, the result is a very complex combination of sounds that is not formed in a constant feedback circle between her and the material. Therefore, it seems reasonable to suggest that the separation of action and feedback somewhat facilitate the occurance of unexpected things.
The suggestion above might explain some of the accidents in the case studies. Thus, when the participants referred to ‘happy accidents’ it was almost always limited to cases where listening and action were separated (except for Emil, see Appendix E). I am not suggesting that ‘happy accidents’ do not happen in general when using an instrument (see Chapter One, section 1.3.4). Rather, the suggestion is that the separation between listening and action facilitates unexpected outcomes in the sense that the composer’s control and predictability is minimized. Further, the time for reflection on such happy accidents is maximized, which might leave room for another type of consideration. In the composition process of Casper (see Chapter Ten) it seems like time for reflection was an important parameter in the creation of what Casper describes as a happy accident (section 10.3.3). Apparently, Casper was not satisfied instantly with the accident but eventually he changed his mind and the accident became a happy one. In other words, time for reflection became an influential factor in the process of composition. Finally, the accidents were often saved immediately when working with software. Thus, due to the characteristic of digital software, as identified by Breinbjerg (Chapter Eight, section 8.3), it is simply possible to retain the accidents. Conversely, when making an accident while playing an instrument, the exact mistake will be more difficult to reproduce if it is not recorded (see also interview with Cæcilie Trier, Chapter Five, section 5.5.3).

11.5.2.3 The computer used as a traditional instrument
As an alternative to the cases discussed above, Henrik used the computer more like a traditional instrument. He played and looped a number of bars, and simultaneously he put in notes in specific places (see video on YouTube, https://youtu.be/M1FFApIKeKk). In other words, Henrik listened to and created the music simultaneously. Now, first of all, this indicates that the differences between traditional instruments and the computer as an instrument are not fixed or absolute in any way. Second of all, it indicates that the composer can control the computer in the same way as an instrumentalist can control her instrument. If the user has comprehensive experience, like Henrik, this control is possible. Accordingly, the software might only facilitate accidents and blind processes if the user is unfamiliar with the technology or decides to intentionally experiment in a blind way.

11.5.2.4 Summing up: different levels of control
The experts were in control of the process in the sense that they (1) produced melodies and harmonies with their own hands, and (2) they were in a constant feedback circle with the
instrument\textsuperscript{6}. The novices were in less control in the sense that they (1) primarily chose between manufactured musical material, and (2) the feedback from the material was delayed. Furthermore, the novices’ experimentations seem to be much more coincidental and norm-breaking compared to the experienced musicians and the experts.

From an ANT perspective the notion of being in control is questionable. One may ask if following musical traditions and norms might indicate dependence on the network rather than autonomy and individual control? Of course, this question is not answerable in any definite way and may first of all rely on a philosophical discussion about the subject’s personal free will (see Chapter Seven, section 7.2). However, in the following I will discuss how the emergence of creative ideas are connected to the creator’s interaction with the material.

\textbf{11.6 An idea arises}

In the following the aim is to explore creativity on a micro-level. According to the notion of little-c creativity it is relevant to investigate the composers’ own grading of their compositions. In other words, I am searching for the musical details that are considered most valuable by the composers themselves. However, the premises of the final interview with the participants might push them in a specific direction. First of all, I encouraged them to describe one musical detail. If they came up with an answer like ‘I am satisfied with the mix of everything’, I forced them to be more specific. That is naturally a rather typical interview technique. Yet, in this analysis, the motivation for going into detail is also related to the ambition of finding the ‘birth of the creative idea’. Thus, the search for creativity is based on a specific notion of what creativity is. Most importantly, this notion is related to the perspective of Simonton as described in Chapter Five, in the sense that the core of creativity is understood as something that occurs momentarily. The same notion is reflected in many theories of creativity, e.g. in the classic theory of Graham Wallas, within which the stage of illumination represents the sudden birth of an idea (see Chapter Five, section 5.1). Needless to say, such a notion may be challenged by other approaches, e.g. the theory of honing as discussed in Chapter Five.

\textsuperscript{6} The question of control is ambiguous. In Chapter Six I indicated that automated skills might be associated with minimum control in the sense that action is not guided by deliberate thinking (see Chapter Six, section 6.3). However, control might also be associated with intuition and tacit knowledge (see Chapter Six, section 6.2.4). Finally the indicated dichotomy might be inappropriate (Chapter Six, section 6.5).
All the stories are included in Appendix E. In the following three selected stories is presented. All the movies may be watched on YouTube:

Casper – an idea is born: https://www.youtube.com/watch?v=hHyU9WpXz-w
Steffen – an idea is born: http://youtu.be/BzaZbBfBhUE
Julie – an idea is born: https://www.youtube.com/watch?v=I-0KKYEOmEY
Katrine – an idea is born: http://youtu.be/jxwm4sBHAA8
Trine – an idea is born: http://youtu.be/lovmvEJYNCO
Christian – an idea is born: http://youtu.be/Fr-vjN20luI
Mikkel – an idea is born: http://youtu.be/f-WwbRlcL_e
Martin – an idea is born: https://youtu.be/U137EJL5TZE
Emil – an idea is born: https://www.youtube.com/watch?v=i0ukXIUzMwE
Laura – an idea is born: https://www.youtube.com/watch?v=vPY610Wnczs
Jonas (Vig) – an idea is born: https://www.youtube.com/watch?v=rEgfnNIFhtg
Cecilie – an idea is born: https://www.youtube.com/watch?v=GwmECkLOol8
Henrik – an idea is born: https://youtu.be/M1FFApIKeKk
Kristian – an idea is born: http://youtu.be/YbT4PV_alLY
Jonas – an idea is born: https://www.youtube.com/watch?v=R_BmqVmvNCA

11.6.1 Three short stories about the birth of an creative idea

11.6.1.1 Julie: the novice

Julie preferred the intro where she combined two different loops that she named ‘guns and stars’. These sounds were initially meant for the outro, but she became so happy about the result that she instead used them for the intro. In the interview, Julie and I discussed whether or not she was looking for something specific. On the one hand, Julie claimed that, ‘I just sit and listen while I put on different stuff. I am not imagining anything’. However, Julie still indicated that she was not searching completely randomly. Apparently, she was looking for something to either fade out or finish the music suddenly, like a big noisy sound. Thus, she was looking primarily within the category ‘movie’, because she figured that a movielike sound would be suitable. However, when looking at the video-recording, it is interesting to see how randomly she operates. First of all she put in many different types of sound. Second of all she maximized the level of coincidence by
sometimes putting in three different loops simultaneously instead of listening to them one by one. This was also the case when she found the sound of the bells that she called ‘stars’. (Watch the movie, Julie – an idea is born: [https://www.youtube.com/watch?v=I-0KKYEOmEY](https://www.youtube.com/watch?v=I-0KKYEOmEY)

### 11.6.1.2 Emil: the experienced

Emil chose a place in the second part of the composition where the horns play a theme that is based on a piano-theme from the first part of the composition. The creation of the piano was both a result of knowledge, experiments, and mistakes. First, Emil was ‘trying out some harmonies’. In other words, he was experimenting partly adopting his knowledge about harmonies. Subsequently, he made a mistake, ‘I hit a note by mistake and consequently the chord sounded better’. Emil did not know the name of that harmony, but he liked it. Thus, you might say that he moved from the known to the unknown by accident. Later in the process, he used this theme as the basic material for the horns. The combination of the piano-theme and the sound of the horns seemed very controlled and intended. In the interview he said that, ‘the little voice [inside my head] said that there had to come something loud and whining’. According to Emil he knew from experience that horns would be a good idea. Further, he instantly assumed that he could reuse the piano-theme. In the video-recording this whole process seems intended in the sense that Emil instantly found the sound of the horns and immediately applied the piano-theme. (Watch the movie, Emil – an idea is born: [https://www.youtube.com/watch?v=i0ukXlUzMwE](https://www.youtube.com/watch?v=i0ukXlUzMwE))

### 11.6.1.3 Henrik: the expert

Henrik chose the grand piano theme as the best musical detail. Before he made it he knew what he wanted:

> I have a pretty good idea of what I want. I knew that I wanted a piano sound and so on and so forth. But I don’t know exactly what I want. I experiment, and I know that I have found the right thing when the music makes me happy. I just loop and loop and loop and try things out’. (Final interview with Henrik, 2013)

Even though Henrik claims that he didn’t know how things would sound before he tried it out, it seems like he had a very good idea after all. In the interview, he suddenly changed the melody and the accompaniment in order to show me alternative versions. And when referring to the grand piano theme he emphasised that it is related to the bassline in a specific way, etc. However, most
importantly it is striking to see how efficiently he constructed this grand piano theme in the video-recording: after 30 seconds the first chord was produced. Thirty seconds after that the first sequence was produced. A minute after that the tiny piano motif, that represents an elaboration of the chords, was produced. Two minutes after that, the entire piano theme was produced. In other words, it took Henrik no more than four minutes to produce the melody of the grand piano. Accordingly, the process seems highly intentional. (Watch the movie, Henrik – an idea is born: https://youtu.be/M1FFAplKeKk)

11.6.2 The birth of the creative idea is embedded in specific situations

The first issue addressed is the circumstances in which the generation of the creative idea is embedded. Naturally, such circumstances are related to how the participants worked creatively in general as described in the previous section (11.5.2). Thus, the novices were mostly interacting with the computer when the creative idea occurred. Conversely, the experts were mainly playing an instrument when the creative idea occurred. However, with respect to the experienced, instrument-playing as well as interactions with the computer seemed to play a role.

| Table 11.8 The birth of the creative idea embedded in different situations |
|---------------------------------------------------------------|------------------|------------------|
| Playing the instrument                                      | Novices          | Experienced       | Experts           |
|                                                             | Casper and Steffen | Martin, Emil, Jonas (Vig), Laura, Mikkel, and Christian | Jonas, Cecilie, and Kristian |
| Interacting with the computer                               | Casper, Steffen, Katrine, Trine, and Julie | Martin, Emil, Mikkel, Jonas (Vig), and Laura | Henrik |

The differences between the participants are even more explicit when examining the musical material that they were working with in the moment in which the creative idea arose. Thus, most of the experienced/experts were generating the most successful creative ideas when they were working with MIDI keyboard or traditional instruments. Instead, the novices were generating the most successful ideas when they were working with loops.
According to the above, the creative moment, identified by the participants, seems to reflect how they work creatively in general. Thus, the issues discussed in the previous section are also relevant in order to understand the birth of the creative idea. Accordingly, the processes of the experienced/experts seem relatively controlled, intended, and sighted whereas the processes of the novices seem blinder. Yet, when investigating the very birth of the creative idea, blind processes are relatively prevalent, also in terms of the experienced/experts. In the following, this will be discussed further.

### 11.6.3 Accidents and coincidences

When investigating all the stories it is somewhat striking that accident and coincidence play such a dominant role (see Appendix E). However, coincidence and accidents take many forms. A number of stories include what might be labelled an accident. Thus, Emil, Martin, Casper, and Mikkel all referred to stories that include accidents in the sense that something went wrong that eventually turned out to be an advantage (see Appendix E). For instance, Emil described how he was ‘trying out some harmonies’ and suddenly made a mistake, ‘I hit a note by mistake and consequently the chord sounded better’. And Jonas (Vig) described how he suddenly felt that the melody that he was working on was changed for the better; however, it turned out that the reason for this was that a note from another track unintentionally merged in (see Appendix E). The role of accidents is summed up in table 11.10 below.

### Table 11.10 The role of accidents in the birth of the creative idea

<table>
<thead>
<tr>
<th></th>
<th>Novices</th>
<th>Experienced</th>
<th>Experts</th>
</tr>
</thead>
<tbody>
<tr>
<td>No accidents</td>
<td>Julie, Steffen, Julie, Katrine, and Trine</td>
<td>Laura and Christian</td>
<td>Cecilie, Jonas, Henrik, and Kristian</td>
</tr>
<tr>
<td>Accidents</td>
<td>Casper</td>
<td>Jonas (Vig), Emil, and Martin</td>
<td></td>
</tr>
</tbody>
</table>
Furthermore, a number of stories contain what is labelled ‘a coincidence’ by the participants. Julie, Mikkel, and Martin, all use the word coincidence (see Appendix E), for instance, when they were doing something that they did not necessarily know would sound good. However, there seem to be huge differences between the types of coincidence they were talking about. When the experienced musician Martin sang and recorded a second voice he did not know how the mix between the different voices would turn out (see Chapter Five, section 5.4.3). However, he was familiar with the leading voice, the harmonies etc. Thus, the level of uncertainty was not absolute. That is, it was not a completely blind process. On the other hand, Julie put a number of loops together that she didn’t know the sound of. Thus, the level of uncertainty was higher. Accordingly, the process seemed blinder. This perspective is also supported by Julie’s own description of her music-making: ‘I just sit and listen while I put on different stuff. I am not imagining anything’ (see section 11.6.1.1 above).

In the case studies, accidents and coincidences are often connected to the use of digital technology. Therefore, it is reasonable to suggest that technology somehow facilitates accidents and coincidences. In the previous section different hypotheses for this were discussed. However, there could be several reasons for this trend. Firstly, it might have to do with the user’s level of experience with the applied equipment. In other words, accidents might be more likely to occur if the creator is not familiar with the equipment. Accordingly, Martin, Jonas, Cecilie, Emil, and Christian did not refer to any accidents regarding their application of musical instruments. However, both Emil and Martin described accidents that occurred during their work with the musical software, a type of equipment that they have limited experience with (see table 11.1). Henrik’s case might also support such an assumption. Henrik has at least eight years of experience with music technology. According to the video observation it is obvious that Henrik was very much in control of the computer (see section 11.6.1 above). Further, Henrik didn’t refer to any accidents. Thus, the computer did not necessarily seem to facilitate accidents and coincidences when the user had comprehensive expertise with the applied software.

The stories may support the theory of blind-variation and selective-retention in the sense that it seems striking that so many of the good creative ideas were based on accidents and coincidents. However, there may be some issues that need to be discussed with respect to the study design. Most importantly, the interview might entail stories about accidents and coincidences in the sense that such stories might be more easily told compared to moments of improvisation. In other words, many of
the participants found it difficult to describe improvisation in any unambiguous manner (see Jonas in Chapter Ten, section 10.2.3, Cecilie in Chapter Six, section 6.6, and Kristian in section 11.6.4 below). Second, accidents and coincidents might promote reflection-in-action because they come as a surprise for the composer. Possibly, the composers are able to remember such incidents more explicitly because reflection-in-action has been activated. Nonetheless, I will argue that the number of happy accidents found in the study support the notion that creativity benefits from random processes.

11.6.4 Intuition and body must be challenged: the case of Kristian

For the experienced/experts many of the most creative ideas happened as a result of intuition and embodied tacit knowledge. Thus, Laura described how the emergence of a new idea was partly prompted by the ‘feeling that something is missing’ in the composition. Further she described how she made one of her favourite ideas through the instrument: ‘suddenly, by coincidence, I played the notes faster …it was something I just did’ (Appendix E). On the other hand, as described in Chapter Six, deliberate thinking is not excluded from the process of composition. Rather, reflection, body, consciousness, and intuition are intertwined in multiple ways.

In the case of the expert Kristian, the interaction between intuition, body, and reflection seems to play a major role. In the interview Kristian chose a piano improvisation as the most essential element in his composition. According to Kristian, the piano improvisation was based on a repetitive rhythm that included three notes that represented the main melodic material. Kristian explains that the idea is probably the result of (1) inspiration, primarily from the composer Steve Reich, (2) an intention to make something sounding satisfying instead of harsh and ugly, (3) former improvisations/experiments at the piano, and (4) controlled improvisation. Controlled improvisation was described by Kristian as a way to improvise according to a specific form, structure, or idea.

Thus, according to Kristian’s descriptions, the composition was a result of automated skills, intuition, and deliberate decision-making and reflection. First of all, the three notes that represented the main idea in his improvisation was a result of automated skills, experience, and musical preferences:
It is something I have played before. It is a bit like Steve Reich, you know, minimalistic music. It just came out. I have played something a bit like that before. Maybe it is something in my fingers [...] In the hands there are some moves and automations. I also play classical music. And when I improvise, I got it with me. It’s inside of me. There are some mechanics in my hands. Because I have played a specific type of music a lot.

(Final interview with Kristian, 2014)

Accordingly the process is highly dependent on his hands and the things that he has played in the past. In general Kristian described the process as highly intuitive in the sense that he deliberately did not think of music theory, rules, etc. However, intuition and the automated moves in his hands might also hinder the production of new ideas in the sense that body and intuition will lead to music that is mainly pleasurable.

I really work intuitively a lot. I get ideas really fast. But I try in general to go against these ideas. [...] You know, as a musician you like to play something that sounds nice. If I work intuitively, the result will be pleasurable. Most often I try not to pleasure. [...] Naturally the music can be novel and yet pleasurable. But to me there are a connection between what is novel and what is unpleasant in some way. (Final interview with Kristian, 2014)

Hence, according to Kristian, intuition needs to be combined with reflexive thinking. Thus, in the process of composition reflective processes seem to be crucial. Most importantly, Kristian described how he often invents different concepts: For example Kristian improvises according to specific rules and strategies that he chooses a priori (controlled improvisation), or he chooses specific sounds or instuments. In that way he is able to go in new directions. (Watch the movie with Kristian on YouTube, http://youtu.be/YbT4PV_aILY)

11.6.5 Summing up

In general, I find it relevant to categorize the birth of the creative idea within different levels of blindness and sightedness. The novices’ ideas were often born in a process that might be described as relatively blind. They experimented and they had in general a very limited idea about what the result of the experimentation would be. Accordingly, the creative idea was often born in a situation
with limited degrees of control and sightedness. Conversely, the experienced/experts’ work was in general characterized by sightedness and control. Often they experimented and improvised by the use of the instrument in a way that seems sighted in the sense that the process and the result corresponded with traditional musical norms. According to the participants, these situations quite often led to the birth of creative ideas. However, the stories also indicate that this control might benefit from interference. Thus, Kristian described how he uses reflective thinking in order to push intuition and automated knowledge in new directions. Further, many of the experienced associate the birth of the creative idea with accidents. Thus, it seems like automated knowledge and intuition might sometimes need to be deliberately or accidentally sidetracked.

### 11.7 The assessment of the music

In the above, differences between novices and experienced/experts are outlined in terms of process and product. However, the question is how the different compositions are judged. Accordingly, the evaluation by the evaluation groups is the focus in the following sections.

In the analysis a number of hypotheses are addressed:

- The experienced/experts make music that is recognized for its quality and craftsmanship.
- The novices make music that is recognized for its originality.
- The music of the experienced/experts is graded higher in the final judgement than the music of the novices.
- The musically experienced members of the evaluation group understand the music differently than the musical novices in the evaluation group.
- The assessment is influenced by the evaluation group’s interpretation of the composers’ intentions.

#### 11.7.1 The final judgement of the music

The first issue addressed is the final judgement of the music of the novices, the experienced, and the experts. In this regard, it is important to stress that it is not possible to point out some general differences. In other words, the novices’ compositions were in general not considered better or worse than the experienced and the experts’ compositions. Nonetheless, there are of course some compositions that were considered particularly excellent by almost all members of the evaluation
groups. First of all, Emil’s composition received extraordinarily positive responses from the evaluation group. Most of the members in the group granted the composition eight, nine, or ten points on a scale from one to ten. Further, the evaluation group described the experienced Emil’s music with superlatives like the following:

- Exiting effects, nice guitar, groovy, great, intriguing sound, super intro, nice bass, beautiful, I would by a record with this! (Simon, Stine, Anastasia, Charlotte, and Kåre’s final judgement of Emil’s composition, 2014)

On the other hand, two of the members of the evaluation group were not that positive. Accordingly, even though the majority of the members of the evaluation group were positive it still doesn’t mean that the music was considered successful by everybody:

- Like a bad film that is too long, my ears still hurts, it sounded a bit like when you pull the tail on a cat (Line and Natascha’s evaluation of Emil’s composition, 2014)

Another example is how the music of the novice Katrine was evaluated. The majority of the evaluation group granted the music eight or nine points on a scale from one to ten. Further, they described the music with terms like:

- Beautiful piano, the music told a story, good combination of piano and drums (Simon, Anastasia, and Kåre’s evaluation of Katrine’s composition)

None of the experts received positive responses like Katrine and Emil. However, what is really being valued, how, and by whom?

11.7.2 The assessment is based on notions about the composer

First of all, it seems like the evaluation group was basing their judgement on a number of assumptions about the process of composition. First of all, they were obviously imagining a composer, a band, or something similar. Thus, they used primarily the words ‘they’ or ‘he’ when they referred to the composer. When they listened to music that sounded like an acoustic band (music by e.g. Martin, Christian, and Trine) they often used the word ‘they as if they were referring to a band. When the music was more electronic, they used the pronoun ‘they’ as well as ‘he’. A few
times they addressed questions of gender, for instance when they said ‘he, or maybe she’. But the word ‘he’ was the most commonly used pronoun.

The explicit references to the composer(s), outlined in the above, indicate that acoustically derived music is associated frequently with a group of people that play together, whereas electronic sounding music is not associated with a band or a single person specifically. Further, it seems to be a general notion that men are composers rather than women (see Boysen, 2014). However, the important thing is that the evaluation group was somehow picturing a specific composer, or sender. In other words, it was not the music as an isolated phenomenon that was being assessed. Rather, it was the evaluation group’s notions about the circumstances in which the composition was embedded that played a key role when the judgement is made. That was evident when the evaluation group addressed questions of craftsmanship and intention (see section 11.7.2.1 and 11.7.2.2 below)

11.7.2.1 Craftsmanship is being valued
One of the striking findings is that the music was often described as being either ‘well-played’ or not. That is an interesting observation in the sense that many of the participants, especially the novices, applied prefabricated loops, instead of playing the music on an instrument with their own hands. In other words, the music was sometimes praised for something that it was really not. For instance, the novice Katrine, the novice Trine, and the experienced Mikkel all applied loops that sounded acoustic, e.g. acoustic piano, saxophone, horns, organ, and electric guitar. Accordingly, the music may sound like the composers had played the instruments themselves:

Well, I can hear that it is well played. The piano sounds beautiful; they know how to play it (Anastasia, group interview about Katrine’s music, 2014). The music sound good. It is well played (Kåre, group interview regarding Mikkel’s music, 2014).

Conversely, questions of instrumental craftsmanship were not on the agenda when loops that sound computer-like or electronic were applied. For example, the novices Steffen and Julie adopted loops and sounds that apparently were considered more electronic and less acoustic (see table 11.2 and 11.3). Both compositions were discussed without any reference to instrumental craftsmanship. The same applies to the expert, Kristian, who plays the piano to a professional level. In his composition,
he improvised on the MIDI keyboard, adopting a sound that was considered ‘electronic’ by the evaluation group. Consequently, even though the entire piece was played on a keyboard, the evaluation group seemed to think otherwise:

*Kåre: I actually thought it was a bit easy.*

*The interviewer: What do you mean by easy?*

*Kåre: Well, you know, the first couple of bars worked out pretty fine but then the bars were just being looped during the rest of the song.* (Evaluation group, 2014)

Equally, the music played by the composers themselves on acoustic instruments was often related to questions of craftsmanship. However, this judgement was in general not that positive. For instance, Mikkel’s composition consisted of an intro played by himself on guitar, and a number of subsequent sections containing acoustic-sounding loops (see table 11.2 and 11.3). However, whereas the loop-based sections were considered quite good by the evaluation group, the intro played by Mikkel himself received mainly negative comments. The same applies to the expert Jonas’ composition, which in general received negative responses in terms of the craftsmanship involved. Further, two of the composers also recorded their own singing voice: the experienced Christian and the experienced Martin both recorded choirs and lead voice using their own singing voice. Both singers received some negative responses in terms of their abilities as singers.

Naturally, the evaluation group’s judgement of musical craftsmanship seems somewhat unfair in the sense that it was frequently based on assumptions about the composers and the process of composition that are more or less inadequate. The implications of these inconsistencies might be interpreted in different ways. First of all, it might be suggested that the judgement is essentially wrong: the novice, Katrine, was praised for her skills as a pianist whereas the professional pianist Kristian was not. Accordingly, that must be a mistake. However, from an ANT perspective, this scenario seems less inadequate. In other words, Katrine’s minimal piano skills seem less relevant if the composition is primarily understood as a product of actions which took place in a network, rather than the fruit of the single work of one individual. Thus, the evaluation group’s notions about craftsmanship are not wrong in the sense that Katrine adopted several piano loops played by a
skilled pianist. Therefore, the composition involves essentially the presence of instrumental craftsmanship.

11.7.2.2 Intentions are being valued

It seems like the notions about craftsmanship are very much related to notions about the composer’s intentions. First of all, questions of craftsmanship seem to presuppose that the composition may be understood as the coherent work of a limited number of people. The same assumption seems to apply to questions of intention in the sense that intention is equally associated with specific persons or groups of people. Second of all, craftsmanship is associated with control. Hence, being in control is in general understood as the precondition for delivering an intended outcome (see discussion below).

Thus, questions of intention played a major role among the members of the evaluation group in general. That was illustrated in the previous chapter, in which the discussion about Casper’s peculiar piano motif and rhythm occupied a key role. The same type of discussion takes place with regard to several compositions in the final phase of the case studies. Most explicitly, this concerns the experienced participants, Christian and Martin. Both of them made musical pieces that essentially followed specific musical traditions (see table 11.2 and 11.3). Nonetheless, both of them implemented a musical detail that seems peculiar, at least in the eyes of the evaluation group. Martin implemented a non-traditional type of choir and Christian placed an unusual rhythmic detail at the beginning of the chorus (see Chapter Five, section 5.4.3 and Chapter Six, section 6.6.2. The unusualness concerning both elements was explicitly addressed by the composers themselves and the evaluation group. However, the question from the evaluation group’s point of view was first and foremost whether the musical details were intended or just the result of mistakes and lack of skill. In other words, they were addressing the same question as was considered in the previous chapter. Again, the discussion seems to be connected to questions of what is allowed according to the rules and codes within a domain (see below).

11.7.2.3 Music can be right and wrong

A general question addressed by the evaluation group was whether the music sounds right or wrong, if the instruments or the different sections fitted each other or not, and if the musical elements were in or out of place. Naturally, this is interesting because it underlines that music is a
language based on rules (see also Middleton, 1990, pp. 172-240, Tagg, 1992). Some things are allowed and some things aren’t. When looking more closely at the discussions in the evaluation groups it is evident that the novices’ music was quite often criticized for being wrong, whereas the music of the experts and the experienced were seldom described in such terms. Thus, all the novices’ pieces of music were frequently criticized for being wrong, messy, out of place, or inappropriate, whereas Martin and Christian were the only ones among the experienced participants that received such responses. Finally, the expert Henrik’s composition was criticized for leaving out a proper ending (see table 11.11 below). However, according to Henrik, the musical piece was simply not finished and the ending was therefore not in place. Accordingly, it seems like Henrik was essentially following the implicit and explicit musical rules after all.

| Novice | Trine                          | • It is messy                        |
|        |                               | • It sounds like different musicians playing their own solo without knowing what the others are doing |
|        | Julie                         | • The sounds doesn’t fit in         |
|        | Casper                        | • The rhythm is wrong – it doesn’t fit |
|        | Katrine                       | • The drums in the middle doesn’t fit in |
|        | Steffen                       | • The pieces don’t fit together     |
| Experienced | Martin                  | • The choir sounds like they are standing in different rooms and not listening to each other, it sounds wrong |
|            |                               | • The choirs don’t fit each other   |
|        | Christian                     | • There is something wrong in the beginning of the chorus |
|            |                               | • The rhythm in the beginning of the chorus doesn’t fit |
|        | Laura                         | (No such type of comments)          |
|        | Mikkel                        |                                      |
|        | Emil                          |                                      |
|        | Jonas (Vig)                   |                                      |
| Experts | Henrik                       | • The outro seems peculiar           |
|         | Kristian                     | (No such type of comments)           |
|         | Cecilie                      |                                      |
|         | Jonas                        |                                      |

Again, questions of right and wrong may ultimately be connected to questions of intention. That is, if the evaluation group feels that the composer is wrong in an intentional way they apparently feel that adequate communication is taking place, even though the musical detail still seems wrong from their point of view.
It is like, well, noise on the line. If the composer knows what he is doing it is not wrong. It is not a mistake. There is no noise on the line. The music has to be taken seriously. But if the music sounds wrong because the composer has no skills then it is simply a mistake. It is like before, when we discussed the piano and the peculiar rhythm [the discussion of Casper’s music]. I think that this specific piece of music is the one that we have discussed most intensely. If this was actually the composer’s initial intention to cause such disturbances, then it was almost a stroke of genius. (Simon, evaluation group number one, 2014)

11.7.3 The communication between sender and receiver

According to the above, there seem to be some inconsistencies regarding the communication between sender and receiver in the sense that the interpretation of the music is frequently built on inadequate assumptions. In this thesis, the quality of communication is of great interest because it concerns the intimacy between the field, the domain, and the creative person(s). Thus, the question is whether the creative person is basing the work on stable, rule based systems that are known to everyone within the field or whether the communication is less predictable and stable?

A key question regarding this topic is the coherence between little-c and big-C creativity (see Chapter Five, section 5.3 and Appendix R). Thus, if the level of coherence is relatively high, it is reasonable to suggest that the communication between sender and receiver is relatively consistent. In other words, if the single creative person points out specific elements as being exceptional, excellent and creative, then it might be suggested that the field within which the creative outcome is judged equally finds these elements intriguing.

According to this study the correlation between personal judgement and judgment in the field seems to be arbitrary. In nine cases there seemed to be some form of correlation, in the sense that a few of the members of the evaluation group highlight the same musical detail as the composer (see table 11.12 below). In five cases there seemed to be no correlation whatsoever, in the sense that no one highlighted the same elements as the composer does. Finally, in one case the correlation seemed to be high in the sense that many of the members of the evaluation group highlighted the same detail(s) as the composer. The result might be interpreted in different ways. On the one hand, it might be suggested that this is a rather low correlation. In other words, if the creator was particularly happy with specific musical elements, why was it that the evaluation group didn’t
notice these elements? On the other hand, as described in Chapter Four, section 4, music might be less stable and less measurable than other domains such as mathematics. Besides, the selection of specific musical elements might not be appropriate in the sense that music is essentially heard as a unit rather than a combination of partial fragments (e.g., Bastian, 1988, p.53). Accordingly a high correlation might not be expected. Still, I will argue that the analysis indicates how problematic it is to presuppose any form of stable communication between sender and receiver. Hence, what is good from the perspective of little-c creativity is not necessarily good from the perspectives of the evaluation groups and vice versa.

<table>
<thead>
<tr>
<th>Table 11.12 Relationship between the composer’s assessment and the evaluation groups’ assessment</th>
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</thead>
<tbody>
<tr>
<td><strong>The elements preferred by the composers themselves</strong></td>
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</table>
| Katrine | Piano-loops  
The drums in the middle section | The piano  
The drums in the middle section | A lot |
| Trine | A short guitar motive in the intro | Bass  
Horn  
Intro | None |
| Steffen | The overlap between different sections  
The horn intro  
The transformed piano-loop | The horn intro  
The bass  
The ‘sound’ | Some |
| Casper | The piano  
The moonbeam theme and sound  
The transformed piano-loop | Piano  
Beat  
The development from piano to beats | Some |
| Julie | The combination of the two loops ‘guns and stars’ in the intro | Drums  
Chimes in the intro  
Guitar in the intro  
The voice | Some |
| Emil | The horns in the middle section | The combination of acoustic and electronic sounds  
The transformation of the music between the different sections  
The guitar | None |
| Jonas (Vig) | The guitar melody | The bass  
The keyboard and the horn/guitar | Some |
| Christian | The bass | The guitar  
The bass  
The melody  
The lyrics | Some |
| Laura | The beats (particular the clap) leading up to the second A-section  
The melody introduced in the second A-section | Drums  
Piano  
The section leading up to the second A-section  
The clap | Some |
| Martin | The song in general | The drums | None |
Furthermore, in a few cases the judgement of the evaluation group and the composer seems to be strictly oppositional. This is most evident in the case of Martin. Martin highlighted the choirs as the most successful musical elements. However, when the music was presented to the evaluation groups, the choirs received very critical remarks from every member. This case is interesting because it might reflect mechanisms in terms of novelty and originality. According to Martin, the choirs were intriguing because they are unexpected, different, and novel. Besides, the choirs also surprised him in the sense that they were not planned (see Chapter Five, section 5.4.3). However, from the perspective of the evaluation group the choirs were also different and novel, but in a bad way. They simply sounded wrong.

11.7.4 Originality and value

One of the main hypotheses in the thesis is that the music of the novices is often considered primarily original whereas the music of the experts is primarily considered appropriate or well-crafted. This hypothesis is primarily based on the case studies in the first and second phases. Further the hypothesis is partly based on the analysis in the previous chapter. However, in the case studies in the third phase, this correlation is not obvious on a general level. In other words, it is not really reasonable to suggest any general trend based on the empirical material in the third phase of the case studies. Some of the novices’ music received more points for its originality than its value. And some of the novices’ music received more points for its value than its originality. The same applies to the group of experienced and experts.
11.7.5 Summing up

- The music composed by the experts and the experienced was not considered worse or better than the music composed by the novices.
- The music composed by the novices included musical elements that was considered ‘wrong’. The music composed by the experts was not described as being wrong.
- The assessment of the music was often based on notions about the composer, the composer’s intentions and the process of creation. These notions are often inadequate.
- The notion of craftsmanship played a key role in the assessment of the music.
- The music of the novices was often praised for the high level of craftsmanship understood as instrument-play. The music of the experienced and the experts was often criticised for lack of craftsmanship with respect to instrument play.
- The composer’s own judgement of the music only partly corresponded with the evaluation group’s judgement of the music.
- In general the music of the novices was not regarded as more original than appropriate and vice versa. The same applies to the experienced and the experts.

11.8 Concluding remarks

In this chapter the attempt has been to investigate and present general trends found in the fifteen case studies in the third phase. Naturally, this approach entails some degree of generalization and excludes comprehensive discussions of single cases. However the ambition has been to make room for cases that seem to represent general trends as well as cases that seems to differ from general trends. As a result of the investigation in this chapter a number of key themes were found and discussed. First of all, different forms of interactions between human and non-human actors were considered. Second of all, different levels of control and autonomy were discussed. Finally, the evaluation of the music led to contemplations regarding the relationship between sender and receiver. In that respect the evaluation demonstrated how notions about the composer and the process of composition play on important role when music are being assessed. Thus, questions of autonomy, intention, and control seemed to be vital from the perspective of the composers as well as from the perspective of the listeners. In the final part of the thesis I will address these issues further.
Part Six: Drawing connections
Chapter Twelve: Discussion and conclusion

12.1 Introduction

In the final part of the thesis, I will try to reach some conclusions based on the empirical material analysed and the theoretical framework outlined. In other words, I will try to draw connections between the different discussions presented in the previous chapters. Accordingly, the relation between expertise and creativity will be discussed with respect to the total volume of produced empirical material and the inclusion of key theoretical issues. The main questions are: Where does creativity come from? How does it occur? And how is it related to levels of expertise?

The discussions in this chapter are supplemented with examples collected from the world of fiction. The point is to exemplify and reflect upon key problems and issues by the means of untraditional sources, e.g. as suggested according to the methodology of grounded theory (see Chapter Two, section 2.2.2). The inspiration from fiction played a vital role in the reflections taken place in my memos. However, in this final part of the thesis, this approach is moved from the backstage to the front stage and made visible. Thus, the following discussions include quotations from Ludvig Holberg, Garcia Márquez, and Peter Høeg, among others.

The structure of this chapter resembles the strategy of the thesis in the sense that the demarcation of creativity is considered essential. Thus, the construction of creativity forms the basis upon which the main questions in the thesis are investigated. Accordingly, the chapter falls into four parts. First, the construction of creativity is discussed. Second, creative processes are examined. Next, the location of creativity is discussed. Finally, the relationship between expertise and creativity is summed up.

12.2 The construction of creativity

Creativity as a phenomenon is defined and captured in the analysis by the use of the three main propositions about creativity outlined in Chapter Four. First of all, this means that creativity is
understood as an individual and a social construction rather than an objective phenomenon. Further, it means that questions about novelty and value play an important role when it comes to the analysis and assessment of the participant’s compositions. In the following, the results of the study are discussed according to the three propositions. Hence, the musical object and the construction and interpretation of the musical object are investigated simultaneously rather than separately. Needless to say, this might confuse and complicate the examination. Nonetheless, this seems like the most appropriate thing to do according to the theoretical framework presented in Chapter Four. In other words, if an objective approach to creativity is put aside, the musical object must be discussed with respect to the individual and social construction of creativity.

12.2.1 The social construction of creativity

*It is a shame that the deacon is not in town, for there's so much Latin in my son's letter that I can't understand. Tears come to my eyes when I think that a poor peasant's son has got so much book-learning, especially as we aren't tenants of the university. I have heard from people who know about learning that he can dispute with any clergyman alive.* (Holberg, 1731/1990, p. 150)

In the famous play by Holberg, Erasmus Montanus, a common farmer’s son, studies Latin at the University of Copenhagen. When he returns to the local community he speaks Latin, regardless of the fact that most of the citizens are not able to understand this language. This plot entails many humorous misunderstandings, e.g. when Per, the clerk, pretends that he is able to speak Latin and Montanus is not able to convince people in the town that Per only speaks rubbish.

The story about Erasmus indicates that communication relies on a common frame of reference. Naturally, music, as is the focus in this thesis, primarily represents an aesthetic form of language rather than a discursive form and may not be interpreted in any unambiguous manner (see Chapter Four, section 4.4 and Chapter Five, section 5.3). Still, the study design presupposes that the evaluation groups and the composers are related to some kind of shared frame of reference and that communication is thereby enabled. Nevertheless, the social construction of creativity that is attempted in the study reveals that communication between the composer and the audience is ambiguous. In the following, the results and the implications of the evaluation groups’ assessment is addressed and questions related to the social construction of creativity are discussed.
12.2.1.1 The implications of expertise with respect to creativity

The first important result of the study concerns the final judgement of the music. The novices’ compositions were considered neither better nor worse than the compositions of the experienced and the experts. This is a trend visible in all the phases of the study. In terms of the main notions about expertise and creativity, introduced in Chapter One, section 1.3.1, this might be seen as a surprising finding. However, there might be several reasons for that result.

First of all, the music made by the experienced/experts was consistently played by themselves whereas most of the music composed by the novices included loops recorded by others. Thus, it might be suggested that the novices were only partly responsible for their creations whereas the experienced/experts were fully responsible. The question is essential in this thesis because it is related to different notions of creativity and different notions of autonomy. Evidently, such questions play an important role from the perspective of the participants that seem to highlight and refer to levels of autonomy and control. Further, questions of autonomy seem to play a vital role for the evaluation group in the sense that they try to understand the music as if it was composed unambiguously by a single individual or some sort of a coherent group of people. However, as discussed in Chapter Eight, section 8.1, the question is whether such understanding of creativity is appropriate. On the one hand it seems obvious to suggest that there exists a creative centrum, a sender, a person responsible for the message. On the other hand, this very notion might be somewhat a construction in the sense that novices, experienced, and experts rely on material, forms, and skills that are extracted from, and connected to, networks.

Second of all, a reason for the surprising assessment might be related to questions of communication as exemplified by the story about Erasmus Montanus. That is, one might suggest that the experts’ music is not understood appropriately: one may find it questionable whether the evaluation group was familiar with the style of music that the semi-professional musician, Kristian, was inspired by. Nevertheless, basically the members of the evaluation group represent different musical preferences and different levels of musical competence. Further, the members of the evaluation group seem to be familiar with the genre and styles that the experienced and the experts adopt in the sense that they are able to categorize the music relatively unambiguously. Therefore, it
seems inappropriate to reject the evaluation groups’ assessment per se as strictly a matter of misinterpretation.

Finally, a reason for the discussed evaluation of the compositions could be that expertise sometimes inhibits creativity and lack of expertise sometimes promotes creativity. In the case studies there are several examples of such relations between expertise and creativity. Throughout the chapter this issue will be discussed further.

12.2.1.2 Originality and value

During the first two phases of the study the novices frequently created music that was considered more original than the experts’ music whereas the experts often made music that was considered more qualified in terms of craftsmanship. Thus, a hypothesis was created with regard to originality and craftsmanship. From this perspective, originality is partly produced as a consequence of lack of competence, and craftsmanship is conversely facilitated by knowledge and experience. Subsequently, this hypothesis became an important part of the study design.

All of the case studies, including the last phase, point in various directions with respect to the outlined hypothesis. That is, sometimes it seems like the hypotheses is appropriate whereas at other times it is apparently not. Again there might be several reasons for this. First of all, the novices’ application of pre-recorded loops means that the compositions that they made relied partly on other people’s musical craftsmanship. Thus, the music of the novices was often understood as good craftsmanship. Second of all, the musical software provides a specific frame within which common musical rules are maintained. Finally, the experts and the experienced were of course not only characterised by craftsmanship. They were also producing original musical elements.

A final point must be made with regard to originality and value. In Chapter Four I discussed whether these terms could be separated. According to the group evaluations it seems evident that the two terms are intertwined. Thus, according to the testimonies of the evaluation groups, originality includes an element of value and vice versa. For example, many of the novices attempted to combine all kinds of musical loops. Nevertheless, such strategies were not considered original per se by the evaluation group. In general, such untraditional combinations of sound are mainly considered original if the result is also somewhat considered valuable. Further, levels of
craftsmanship seem to be intertwined with levels of originality. Thus, the evaluation groups rarely consider music to be extremely well crafted but at the same time not original at all. On the other hand, the distinction still seems to be relevant, such as in the case of Cecilie where the evaluation groups explicitly discussed how the music is well done and beautiful but at the same time lacking any original ideas or elements.

12.2.1.3 Traditions broken or followed

Plain objectivity is not suggested in the thesis. However, the music is analysed by the adoption of the evaluation groups’ reflections as well as my own investigation of the final compositions. According to the evaluation group, the music made by the novices was much more uncommon than the music made by the experienced/experts in the sense that genre was mixed and traditions were broken. Further, my own analysis of the music indicates that the novices’ music was unconventional in terms of form and structure whereas the music made by the experienced/experts was much more in line with well-known musical forms. Nevertheless, as described in the above, music that departs from musical norms was not necessarily considered ‘original’ by the assessment group.

12.2.2 The individual construction of creativity

He spent several days as if he were bewitched, softly repeating to himself a string of fearful conjectures without giving credit to his own understanding. Finally, one Tuesday in December, at lunchtime, all at once he released the whole weight of his torment. The children would remember for the rest of their lives the august solemnity with which their father, devastated by his prolonged vigil and by the wrath of his imagination, revealed his discovery to them: ‘The earth is round, like an orange.’ (Márquez, 1967/2003, p. 4)

In the book One Hundred Years of Solitude by Garcia Marquez (1967) the patriarch Jose Acradia Buendia is portrayed as a very unique person, who apparently is able to make all kinds of possible and impossible inventions. However, one of the most astonishing ideas that he comes up with turns out to be rather basic in the sense that the discovery that ‘the world is round’ is old news outside the city of Marcado in which he lives. However, from the perspective of Jose Acradia Buendia, the discovery is still rather astonishing, a fact that is also emphasized by his gypsy friend, Melquiades.
In the present study, creativity is addressed partly from the perspective of the individual composer. The empirical material produced indicates that the participants first of all highlighted musical elements that represent something novel from their own point of view. In other words, like Buendia they produce something surprising and interesting, but it is not necessarily these elements that they are recognized for by others. This is a crucial point that will be discussed and exemplified throughout the following section.

12.2.2.1 Implications of the study

In the study design I tried to demarcate the most creative elements in the composition from an individual perspective and I try to investigate the events which have taken place leading to these creative ideas. This approach resulted in distinctive differences between the novices and the experienced/experts, a difference that seemingly mirrors the different styles of composition adopted by the participants in general. Accordingly, many of the novices engaged in working with loops and searching for sounds when the creative moment arises, whereas many of the experienced/experts were involved in different forms of improvisation and experimentation on their musical instrument.

However, this general picture is also challenged. First of all some of the novices also attempted to play on the MIDI keyboard and some of them were even quite satisfied with their performance and the result. The reason for this is not that they considered the self-made melodies the best musical parts per se but rather that they accomplished playing the music with their own hands. Accordingly this has to do with two important issues. Firstly, they considered the musical elements successful because they had learned how to play them during the process. In other words, it is a question of learning and development. The playing on the MIDI keyboard was not extraordinary per se but it is extraordinary compared to the skills of the novice. Secondly, it is a question of autonomy. The novices felt that they somehow became the genuine creators of the musical element if they played it with their own hands.

In general accidents and coincidence seem to play a major role. Accordingly, many of the participants described how accidents and coincidence led to the creative ideas they consider most successful. On the other hand, the most successful ideas are also the result of improvisation,
reflection, and different forms of experimentation (I will return to that type of processes later). However, the amount of accidents and coincidences seem prevalent.

In the light of the above, it is obvious that the composers highlighted specific elements of their composition for several reasons. Thus, it is not only a question of the outcome but also a question of the relatedness between the outcome and the composer’s own horizon and point of departure: sometimes accidents happen that surprise the composer and thus change the composer’s perspective. And sometimes the composer manages to do something that he has not been able to do before. Again, the composer’s perspective has somehow evolved. In that respect, the stories seem to be related to Boden’s and Amabile’s interpretation of little-c creativity in the sense that creativity depends on the relation between creator and creation (Chapters Four and Five). This also explains why the participants only highlight musical elements in their composition that they feel responsible for. In other words, even though pre-recorded loops might be highlighted positively by the evaluation groups, the loops are often not highlighted by the composers because they don’t feel like the autonomous creators of these musical elements.

12.2.3 The presumed connection between composer and audience

When the dwarf spoke his voice was like threadbare velvet, overlaid with the delicate patina of all linguistic regions through which his long life had taken him. ‘When you’re my height,’ he said, ‘it can be quite pleasant to look upon the world von oben like this’.

(Høeg, 1990/1997, p. 223)

In Peter Høeg’s short story ‘Compassion for the children in Vaden’ (Hoeg, 1990) the young man Kristoffer finds himself in a loft at night with the famous and wise old clown, the dwarf, Monsieur Andress. During the night they engage in a long conversation about life and death and Kristoffer feels enlightened in an almost magical way. However, in the end the clown removes his mask. The clown turns out to be a twelve year old child who normally works as Monsieur Andress’ assistant. The real clown has passed away.

Who is responsible for the clown's wise words? Is it the clown, is it Kristoffer, or is it something in between? From the perspective of hermeneutics the meanings of an expression are constructed by the recipient who receives the message. In this perspective, Kristoffer is responsible for putting
sense into the clown’s words. As described in the well-known hermeneutic circle, Kristoffer listens to Monsieur Andress in a specific way that is based upon his previous understanding of the famous clown. Accordingly, he tries to link the individual parts to the whole picture and vice versa. So when the clown says, ‘you can always jump, Kristoffer’ (Hoeg, 1990, p. 226), Kristoffer initially interprets this remark as an example of unlimited wisdom. In the present study such notions about the sender seems to have a dominant meaning.

12.2.3.1 The implication of the study

The case studies in the third and second phase indicate that the attempt to place and understand the composer plays an essential role in the way the evaluation groups assessed the music. Frequently the members of the various evaluation groups asked for information about the composers. They regularly wanted to know how the music is made and by who. Further, they made up various assumptions about the composer and the process of composition that sometimes were presupposed implicitly and sometimes discussed intensively. Thus, notions about the music’s creator seem to play an extraordinary role with respect to the assessment of the music.

Evidently, the discussions about the music appear to be most prominent when the music represented something uncommon that the members of the evaluation group were unable to categorize in any traditional manner. In these situations they frequently discussed whether the music contained some kind of a mistake or whether it was actually intended. During these conversations the members emphasized that whether or not something is intended influences their judgement highly. Conversely, the music that apparently belongs to a specific tradition is not explicitly discussed. Instead circumstances related to the creator were implicitly presumed.

According to the system theory described in Chapter Four, the outlined tendency makes sense. If domain specific rules are followed, the members of the social field might interpret the artefact relatively straightforwardly. However, if the rules are broken, the social field must decide how and in what way the peculiar artefact might fit into the domain. If the sender intentionally breaks the rule of the domain, the artefact’s possible inclusion in the domain must be considered. If the sender does not know the rules of the domain or simply does not know how to handle them, then the artefact can be ignored and cast away.
12.2.3.2 *Do the composer and the audience understand each other?*

According to the above, the evaluation groups seemed in general to implicitly presume that they somehow understand the music, the intentions, and the composer responsible for the message. This assumption may be questioned. First of all, the listener and the composer did not in general emphasize the same musical details when they described the most prominent and successful musical elements in the compositions. Second of all, they often imagined things about the composition-process that were incorrect. Naturally, this does not prove that their interpretation of the music is out of sync with the composer’s intentions. Nevertheless, it implies that communication is not a straightforward process even though the audience may orient their judgements on the notion that a certain kind of straightforwardness exists.

Naturally, the communication that takes place in the case studies represents a connection between sender and receiver that can be categorized as relatively weak according to network theory (Nørretranders, 2007). Thus, the receivers were not familiar with the senders’ music in general and they did not know anything about the senders’ age, gender, and background. Conversely, in a naturalistic setting the audience will interact with the artist in different ways and the connection between sender and receiver will be stronger. Nonetheless, there are reasons to believe that people in a natural setting also partly base their judgement on questionable assumptions about the composer and the process of composition (see for example Negus, 2011).

12.2.4 *Summing up*

Creativity is the result of a construction that relies on the musical object, the context within which the evaluation is made, and the subjects responsible for the evaluation. Thus, the social construction of creativity depends on notions about the composer’s intentions, competences, and practices. Equally, the individual construction of creativity depends on the subject’s point of departure and how the musical outcome and the process of composition are related to the subject’s competences and frame of reference.

The study indicates that novices, experienced musicians, and experts are all equally capable of making music that is considered creative. In general, the music of the novices explicitly broke musical norms whereas the music of the experienced musicians/experts was more in line with musical traditions. However, the breaking of norms was not always considered novel in the sense
that novelty apparently is partly intertwined with value from the view of the assessor. Further, the music of the novices and the experienced musicians/experts were equally recognized for their craftsmanship. However, in general, experienced musicians/experts were criticized more often for the lack of craftsmanship than was the case with the novices.

The use of technology seems to entail many important issues of concern. First of all, the novices were primarily using loops and the experienced musicians/experts were using primarily instruments. Accordingly, the assessment of the novices’ music often included notions about the composers’ craftsmanship and competences that were incorrect. Further, the use of technology seemed to result in lack of autonomy from the composers’ point of view. Next, the technology seemed to facilitate mistakes. Finally, the musical software ensured the implementation of musical norms. However, these musical norms were also broken.

In this section creativity was discussed according to the three propositions outlined in Chapter Four. Accordingly, the attempt has been to identify the presence of creativity. This discussion forms the basis upon which an examination of different types of processes can take place.

12.3 The creative process

In the following I will try to sum up and discuss the creative processes observed in the case studies with respect to different levels of expertise. Thus, I will focus on different strategies of composing and how experience is adopted in the creative process. Again, inspiration from fiction will occupy a main role in order to exemplify various perspectives.

12.3.1 Sighted and blind processes

‘If I can't have a horse I'll take the billy goat,’ said Jack the Dullard. ‘He belongs to me, and he can carry me very well.’ So he mounted the billy goat, dug his heels into its sides, and galloped off down the highway. 'Alley-oop! What a ride! Here I come!' shouts Jack the Dullard, singing so loud that his voice was heard far away. But his two brothers rode quietly on ahead of him. They were not speaking a word to each other, for they were thinking about all the clever speeches they would have to make, and of course these had to be carefully prepared and memorized beforehand. 'Halloo!' cried Jack the
Dullard. ‘Here I come! Look what I found on the road!’ Then he showed them a dead crow he had picked up. ‘Clumsy!’ said the brothers. ‘What are you going to do with that?’ ‘Why, I am going to give it to the Princess!’ ‘Yes, you do that,’ they said as they rode on laughing. (Andersen, 1855/2009, p. 541)

The brothers of Jack the Dullard ride straight to the Palace. They do not pay any attention to the things they meet on their journey. Why should they? They have a destination and a plan. They are riding to the palace in order to marry the princess. Jack the Dullard, on the other hand, is picking up items that he finds by coincidence on his journey. The items do not fit into any master plan. Jack does not really have any specific intentions with these items. However, later on he finds a proper and yet unexpected way to make use of the peculiar things that he has collected on the journey.

In the story about Jack the Dullard it turns out to be beneficial to pick up unexpected things on the way instead of just focusing on the end of the ride. Thus, it seems like impulsive behaviour may be interpreted as a positive thing, whereas sightedness represent something bad. However, it might not always be a good idea to follow any sudden thought or idea. For example, Odysseus manages to pass the Sirens precisely because he avoided impulsive behaviour. And Columbus probably made a good choice when he decided to stick to his vision about the earth being round, even though he didn't find the way to India. In the following, this will be discussed further.

12.3.1.1 To have a plan or not to have a plan

One of the most striking differences between the novices and the experienced/experts was how they implemented plans and strategies in the compositional work. The experienced/experts were working with specific strategies. They were basing their composition on a particular musical form and structure and they were relying on a specific order of work. Conversely, the novices worked without a specific plan or they implemented a plan that appeared to be less specific.

In the light of Chapters Ten and Eleven it seems obvious that the experienced/experts relied on their former experiences and knowledge. They followed specific procedures, which they knew would lead them in a specific direction. They had tried these processes before. ‘I always start with the drums’ said Christian. ‘I always begin with the melody’ said Henrik. Thus, because of their experience they were basing the work on a specific line of order. It seems reasonable to relate the
level of planning with Amabile’s discussion of algorithmic and heuristic processes. According to this distinction, the experienced/experts apparently implement different type of algorithms. In other words, they follow various rules. However, it should be noted that the composers’ work cannot be described as strictly algorithmic. In other words, it is not possible to predict the outcome of the composer’s work a priori based on specific algorithms. Nevertheless, it seems like the implementation of different algorithms is dominant among experienced musicians and experts.

Conversely, the novices were not following specific rules, at least not compared to the experienced musicians and experts. First of all, they had no former experience that can help guide them in a specific direction. Second of all, they had not been given any specific manual that they could follow. From this point of view, the novices in these case studies are essentially different form the novices described by Dreyfus and Dreyfus that typically follows a kind of manual (see Chapter Six). Naturally, one may suggest that the rules are represented by the software that the novices applied (see Chapter Nine). Nonetheless, it seems like the novices were experimenting rather than implementing specific plans or rules. In other words, even though musical rules were retained through the musical software, the single novice was not following plans or strategies imposed by themselves, at least not compared to the experienced musicians and the experts. In the following I will look more closely at the implication of these different strategies in the light of the theory of blind-variation and selective-retention.

12.3.1.2 Blind-variation and selective-retention

In Chapter Five I discussed the essence of creativity in the light of a systematic view on creativity represented by Weisberg and Gabora among others, and a more chaotic view on creativity represented by Simonton and the theory of blind-variation and selective-retention. In Chapters Five and Six, I proposed that creativity must be understood as partly blind and partly sighted. In the following I will discuss this issue further. In other words, what are the implications of the entire study with respect to these different approaches to creativity?

It seems reasonable to suggest that the study underpins notions about creativity understood as blind-variation and selective-retention as well as creativity understood as a relatively systematic and sighted process. First of all, accidents play an important role in the creative processes. In the study accidents were found in all the phases of the enquiry and were often acknowledged by the
participants as a crucial element of the creative process. The accidents were blind in the sense that they were not in any way part of an intended or foreseen action. In many cases the participants rejected or adjusted the mistake. Yet, in some cases, the mistake was selected and retained. Further, the participants often experimented without knowing exactly what will come out of the trial. This type of action might be understood as partly blind and partly sighted. The action was blind because the creator did not know the end-result. Yet, the action was sighted in the sense that the experiment was intended. In some cases it seems like the creator was basing the experiment on well-known structures, e.g. when the experts improvised on the instrument. They did not know exactly how it would sound, but they had a pretty good idea. In other cases, the creator tended to form experiments that would intentionally move them from known to unknown areas. For example, they intentionally played strange sequences of harmonies that they did not know the sound of in advance or combined intentionally different loops that resulted in an unpredictable outcome.

According to the above, there seems to exist a continuum from completely blind processes to completely sighted ones. Thus, an interesting question might be, at which end of the spectra does creativity reside? This investigation implies that some sort of blind processes are crucial in terms of creativity. In particular, the fact that accidents played a vital role in the investigated cases indicates that creative processes benefit from the presence of unforeseen events. Furthermore, it seems like plans and strategies sometimes hinder creativity. On the other hand, sighted processes are also crucial for creativity to happen (see below).

Naturally, from an ANT perspective, a process will not be blind but rather influenced by different human and non-human actors in a network. Thus, even if the human actor does something relatively blind in the process of composition, sightedness might be represented by the non-human actors involved (see Chapters Nine and Ten). However, I find it reasonable to focus on the degree of sightedness from the composer’s point of view.

12.3.1.3 Systematic work and creativity
According to Simonton true creativity happens primarily as a consequence of blind-variation and selective-retention. Simonton acknowledges the importance of systematic and sighted processes. Yet, according to Simonton true creativity happens in specific moments of blind-variation and selective-retention. In other words, the most central aspects of creativity can be isolated to specific
moments, whereas the rest must be understood as more common rational and systematic working-processes.

On the one hand, the present study might support Simonton’s distinction between moments of creativity and periods of systematic work. First of all, some of the most experienced informants described how the creative process includes a phase in which a creative idea is born and a subsequently phase in which it is more or less a matter of getting the job done, e.g. Cæcilie Trier (Chapter Five, section 5.5). Second of all, many of the participants were actually able to pinpoint specific moments in which the basic and valuable idea was produced in few seconds, e.g. Christian and Kristian.

On the other hand, the present study indicates that Simonton’s proposal is questionable. First, the division between a phase of selection and a phase of honing/craftsmanship is not always appropriate from the perspective of the participants. Thus, according to many of the participants the creative process is much more convergent: this is indicated by the fact that some of the participants considered the designation of the precise location of creativity as basically inappropriate (Appendix E). Of course this might be explained simply as an indication of no presence of true creativity in the investigated cases. Probably, that would be Simonton’s argument. Nevertheless, regardless of such an objection, some of the participants’ testimonies might indicate a blended process of creativity within which the birth of the creative idea might not be understood as something distinctive and delimited. Second, it seems like the period of honing often includes more than that. In other words, accidents frequently move the creator in unforeseen directions in periods of honing. Further the constant interaction with the material seems to play an important part in terms of the creative process. Thus, as described in Chapters Five, Six, and Nine, the interrelation between the material and the human actor seems crucial.

12.3.2 The role of reflection and intuition
The constructions of various plans and composition strategies are related to the role of intuition and reflection as discussed in Chapter Six. With respect to these discussions, the implications of the case studies point in different directions. Thus, reflection and intuition may hardly be associated in any definitive way with specific types of outcomes and processes in the sense that hand, mind, intuition, and reflection seem intertwined in various ways. Nevertheless, as argued in Chapter Six, it
still makes sense to draw a distinction based on these terms as long as the categorisation is not understood to be too absolute.

12.3.2.1 The implication of reflection

First of all, reflection seems to be connected to the creation of master plans, e.g. regarding choice of genre, instruments applied, etc. In other words, the participants seemed to be reflexive about the frame of reference within which the composition was formed as well as procedural issues concerning the process of composition. Such plans are sometimes associated with the confirmation of musical norms and sometimes the opposite. Hence, the composers sometimes made explicit decisions in order to break with traditional norms and sometimes made explicit decisions to follow musical norms. Accordingly reflexive thinking might be used proactively to move within a specific musical norm as well as move beyond a specific musical norm.

However, reflexive thinking was often intentionally rejected by the participants. Many of the participants explicitly tried not to think, because thinking from their point of view often destroys the creative process. In such situations, the participants associated thinking with the sighted reliance on rules and norms instead of the reliance on feeling, sense, and intuition. Further, as described in Chapter Six, deliberate thinking might be understood as slow and effortful whereas intuition might be understood as fast and effortless. Accordingly, the participants might have periodically rejected deliberate thinking for such reasons.

However, the rejection of deliberate thinking seems to entail very different scenarios. The main proportion of the novices rejected reflexive thinking in order to do something blind or unintended in the sense that they listened to and combined various different loops. Thus, reflexive thinking seemed to be replaced by some kind of blindness. Often such blind processes seem to entail the breakdown of musical norms. Conversely, the main proportion of the experienced musicians and experts rejected thinking in order to ‘think with their hands’, ‘follow musical instinct’, ‘work intuitively’ etc. The question is whether such process is characterized by the implication of norms and rules or not.
12.3.2.2 The connection between intuition and the unknown

Based on the case studies it seems like intuition leads to musical outcomes that are not norm breaking but rather the opposite. In other words, intuition does not seem to entail remote associations or any other type of process or outcome that is associated with the breaking of norms. The participants were first and foremost working within specific traditional frames when they were working intuitively, e.g. when they were ‘doing something with their hands’. According to the discussions in Chapter Six, section 6.7, this makes sense. However, this is also a rather bold conclusion that needs to be questioned. First of all, as described in Chapter Four, creativity may be characterized as something that is novel in a specific appropriate way. Accordingly, it is naturally not just the amount of novelty that defines the level of creativity. As Klausen emphasizes, the music of Mozart is considered creative even though it is following musical traditions to a great degree (see Chapter Four). However, novelty might still be there, only in a less explicit way. Accordingly, it may be wrong to argue that intuition does not lead to novelty per se, but only that it does not lead to very explicit breaking with norms.

Secondly, one might argue that intuition plays another role among professional artists than the experts investigated in the case studies. Thus, one might suggest, in line with Dreyfus and Dreyfus, that the comprehensive amount of expertise and experience enables such artist to do extraordinary things intuitively. The interviews with professional artists in this study hardly support such a statement. Cæcilie Trier compares the process of composing with architecture in the sense that she builds up a concept or an idea and will subsequently ‘fill in the empty spaces’ as she puts it (see Chapter Five, section 5.5). According to her, the important part of the process of composition takes place in the first phase before any music is actually made. This phase is, as far as I understand Cæcilie, characterised with processes of reflective thinking rather than intuition. Equally, Nicklas Schmidt described how he makes reflective decisions in order to move away from common routines and produce something novel. Further, Sandra Boss has explained how she designs musical settings specifically in order to promote accidents (Chapter Six, section 6.7). Thus, it seems like reflective thinking rather than intuition is the key to novelty. Essentially, intuition seems to promote appropriateness.
12.4 The location of creativity

The main tradition within the field of creativity is to focus on an individual or a limited group of individuals when creativity is addressed. However, in the thesis I argue that creativity is a phenomenon that essentially happens within networks rather than within single individuals. Thus, the ambition is to include both human and non-human actors in the analysis and interpretation of creative processes. In turn, this problematizes the attempt to propose some differences between the participants as single subjects. First of all, this means that the composition strategy discussed in the above might also be related to the non-human actors involved.

In Chapter Eight I argued that the interface of GarageBand might invite the composer to mix different genres and to build up a dense musical texture. In other words, the composers might be influenced by the affordances offered by the software. This perspective might be supported by the fact that the majority of novices in all phases of the study composed eclectic music. In other words, the eclectic composing strategy might be a result of the musical software rather than a result of the level of the novices’ expertise. However, the entire volume of case studies only partly supports such a suggestion in the sense that experienced musicians and experts that worked with loops in the first session of the music course produced both eclectic music and genre-specific music (see Appendix J and Appendix N). Accordingly, the eclectic outcomes are the result of many parameters, including the level of the composer’s expertise and the type of software applied: that is, the mechanism is multi-causal.

According to the above and the result of the study in general, it is important to stress that the interaction between human and non-human actors doesn’t appear to be constant or stable. The interaction might take many forms. First of all, the user is not determined by the non-human actor and vice versa. Second of all, there doesn’t seem to exist a constant balanced relation between the composer and the material. In other words, the user might sometimes force the non-human actor in specific directions whereas in other situations the non-human actor seems to be forcing the human actor in a specific way (see also Chapter Nine, section 9.4). In the following the role of the two main non-human actors in the case studies are addressed, the computer and the musical instrument.
12.4.1 The instrument and the computer

The main proportion of the experienced/experts in the case studies applied instruments whereas the majority of the novices applied loops. The different non-human actors seemingly entail different type of processes. When the experienced/experts were playing instruments they seemed to follow well-known musical norms. That is, they improvised or experimented with harmonies and notes that were related to traditional scales, rhythms, and harmonies. Hence, even though they experimented they did not in general try out completely unusual ideas. Conversely, the novices’ interactions with the computer moved in another direction. On the one hand, the software only allows a specific norm-based musical outcome in terms of harmony and rhythm (see Chapters Eight and Nine). On the other hand, the computer permits and invites the combination of many different types of musical samples, including a broad spectrum of different genres. Thus, the novices’ compositions often represented eclectic unusual combinations and yet traditional musical structures in terms of rhythm and harmony.

12.4.1.1 The mind and the computer

It seems evident that the interaction between computer and composer differ from the interaction between instrument and composer. The differences depend on which template of GarageBand is applied. Thus, working with MIDI recording and MIDI keyboard resembles working with a musical instrument, whereas working with loops and effects departs essentially from playing a traditional instrument. The differences between working with loops and instruments seem crucial in terms of the creative processes.

Firstly, the feedback mechanism is basically different. When working with loops the feedback is delayed. Conversely, when working with a musical instrument the audio feedback appears immediately. In Chapter Eleven, section 11.6.3, I argued that the implications of this are essential in terms of the creative process. Thus, when working with loops, the room for reflection is reinforced because the composer has extra time to reflect upon the result of his actions. Further, the strategy of composing that includes the blending of loops, means that the composer hardly can predict the outcome of their actions, at least not in any definitive way.

Secondly, the actions are not connected to automated skills related to instrument play. Thus, the composer is not guided by musical procedural knowledge (see Chapter Six). In the investigation
this circumstance seems to facilitate processes in which the composer experiments with musical versions that seem relatively far from traditional musical norms. It seems obvious to suggest that such experiments are partly reinforced by the disconnection of automated instrumental skills.

12.4.1.2 The affinity between theories of creativity and the role of musical software

The discussion above may be further elaborated with a reference to the affinity between theories of creativity and the affordance offered by GarageBand, as discussed in Chapter Eight. On the one side bisociation was explicitly practised when the composers somewhat randomly combined different loops. This type of practice might also be associated with blind variation as described according to Darwinian creativity. Further, the time and space for selective retention is reinforced by the time provided by the delayed feedback and the software’s ability to save every variation. Accordingly, musical software might promote creativity. The result of this study partly supports such a suggestion. However, as described in Chapters Four and Eight, creativity is basically an individual and social construction. Therefore it is not reasonable to propose that some technology per se facilitates creativity.

12.5 The relation between expertise and creativity

I will finish this chapter with a reference to two movies starring two of the most successful actors of the twentieth century, Robert Redford and Harrison Ford. In the movie Three Days of Condor, the CIA analyst, Joe Turner (Redford), suddenly finds himself on the run, hunted by the professional assassin, Joubert (Max von Sydow). Turner has no experience at all with the dangerous life in the field. Yet, Joubert is almost unable to find Turner. In the end, when Turner is finally caught, Joubert explains that Turner’s lack of experience made it impossible to predict his next move. In other words, it was Turner’s lack of experience that promoted his unexpected strategy that in the end saved his life. The other movie I would like to include in this final section is Indiana Jones: Raiders of the Lost Ark. Indiana is an expert within the field of archaeology. No one knows archaeology better than he. He travels around the world, he reads ancient languages, and he solves riddles and mysteries. In the first Indiana movie he is able to find the Ark of the Covenant before anyone else, including the Nazis, partly because of his comprehensive knowledge and expertise.
The relation between expertise and creativity is not in any way predetermined, unambiguous, or stable. Turner would probably not succeed in the role of Indiana Jones without being familiar with the symbols of ancient languages, and Indiana would probably not find the Ark of the Covenant without the ability to do unexpected things, not typically associated with an archaeologist. The level of creativity depends on many parameters. Expertise is only one of them. And expertise might promote creativity as well as the opposite. Yet, the main object of this thesis has been to investigate the complex relation between creativity and expertise. Obviously, the answer to this question is not possible to break down into a few words or sentences. Hence, the answers that I have managed to reach in this thesis are spread across the entire quantity of chapters rather than summed up in the very last lines of the thesis. Yet, I will try to summarize the most important findings.

Expertise might lead to an entrenched perspective in the sense that knowledge and experience may work as a path into the well-known rather than into the unknown. This limited perspective may be caused by sighted reflective processes, including master plans, strategies, choices of form, and choices of genre. Further, intuitive thinking and tacit knowledge that depends on routines, former knowledge, and motor skills may reinforce this limited perspective. Finally, communities of practice might promote reproduction instead of production. However, when the expert moves into unknown territories, reflective thinking seems to be the main dynamic factor, rather than intuition.

Expertise is important in a creative process for several reasons. First of all expertise provides a comprehensive amount of knowledge and knowhow that may be combined or developed in many different ways leading to many different results. Secondly, expertise provides the tools by which specific goals can be reached. Thirdly, expertise provides techniques that may help in the meeting of the requirements of value and craftsmanship. Finally, expertise provides competences in order to form a creative product according to the codes and signs within specific knowledge domains and communities of practice.

Lack of expertise, on the other hand, enables blind experimentation that may lead to unexpected results. However, the lack of expertise might also inhibit creativity in the sense that expertise is also crucial in a creative process (see above). First of all, a blind process needs to happen within relatively sighted processes. Straight blindness without purpose leads to no creativity. In other words, blindness has to be implemented in processes that are partly sighted, and this sightedness
relies on some kind of expertise. Second of all, the selection of blind variations and the subsequent honing depend on expertise.

Digital technology may influence the relation between expertise and creativity in several ways. Firstly, digital technology may provide some of the necessary expertise that the novices do not own. However, from a little-c perspective such procedures may not necessarily be seen as creative because little-c creativity apparently includes a kind of explicit autonomy. Secondly, digital technology might be productive in terms of providing a platform upon which partly blinded processes can be practised. Further, digital technology seems to reinforce time for reflection that may lead to the unknown instead of the well-known.

In the thesis I argue that creative processes rely on some degree of blindness. This notion is reinforced by the fact that mistakes seem to occupy a crucial part of creative processes. This finding may result in provocative conclusions regarding the relation between creativity and expertise. Most importantly, the creator’s total control seems to be an obstacle in creative processes in the sense that total control hardly makes room for mistakes. Thus, lack of competence may promote creativity in the sense that this can be related to lack of control. However, experts might intentionally put themselves in situations within which control is minimized in order to promote blindness.

Creative processes are addressed in the thesis partly as an individual phenomenon and partly as a phenomenon unfolded in networks. According to the approach inspired by actor-network theory, the autonomy of creative processes may be questioned, in that the human actors are connected to other human actors and non-human actors. Thus, the creative humans depend on digital technology as well as musical instruments. However, this relation is by no means stable. Sometimes, the subject’s autonomy seems to be prevalent and on other occasions the impact of the non-human actor seems to be dominant. From the composer’s own perspective, the reliance on musical software is in general associated with lack of autonomy whereas the reliance on musical instruments is associated with high autonomy. Hence, even though digital software allows the novices to produce music considered creative by other people, the novices themselves do not necessarily agree in the sense that they do not feel that they have contributed to the process in a creative way. In other words, they don’t feel as though they are the genuine creator. However, this notion about different levels of
autonomy might not be appropriate in the sense that the use of traditional musical instruments also entails dependence on other human and non-human actors.
Chapter Thirteen: Final remarks

The final chapter of the thesis includes a number of final remarks regarding the research conducted, the proposed conclusions, the relation to other studies, and the potentials for further research. In other words, this is a post hoc comment on the thesis as a whole.

13.1 The findings of the thesis compared to other studies

Throughout the thesis, central issues of concern have been discussed in the light of the on-going analyses of empirical material. Further, the most important conclusions and findings have been discussed in Chapter Twelve. Nonetheless, I will now sum up the results that I consider especially important with regard to previous studies within this field of research.

Previous studies indicate that novices work more explorative than the experts (Scripp et al., 1988; Folkestad, 1996; Seddon & O’Neill, 2003, Hewitt, 2009). In general, the present study supports that suggestion. However, to me the crucial point is how this type of behavior is related to creativity. In other words, if explorative behavior does not lead to creativity as it is defined according to various traditions it is hardly relevant to interpret this activity as a kind of indicator of creativity. In the present study, the ambition has been to connect a sound demarcation of creativity with behavioral characteristics. In that respect the study indicates that explorative behavior in fact promotes creativity in the sense that musical ideas in general are generated through explorative work.

In line with the above, one of the main discussions addressed in the thesis is whether creativity must be understood as essentially blind or sighted. This study indicates that creative activity relies on some degree of blindness. Thus, the role of accidents and random processes seem more prevalent than suggested by scholars such as Amabile, Weisberg, and Boden (see Chapter Five). Furthermore, the study indicates that blind processes are present both when it comes to little-c and big-C creativity. This might be an interesting finding in the sense that most studies preoccupied by this issue are focused on big-C creativity rather than little-c creativity (Beghetto & Pluncker, 2007, pp. 378-379). Thus, it is often assumed that the theory of BVSR is most appropriate when it comes to
big-C creativity (e.g. Simonton 2007b, p. 393). Accordingly, the present study provides new knowledge about the importance of blind processes. However, the study also demonstrates that blinded processes must be intertwined with, or framed by, sighted processes in order to promote creativity.

Previous studies preoccupied by big-C creativity indicate that a person must be an expert in order to be creative (Gardner, 1993; Csikszentmihalyi, 1999; Sternberg, 1999). In this study I have tried to simulate social constructions of creativity. Accordingly, the study indicates that it is possible to be creative without being an expert. However, this finding might be questioned in the sense that the social construction of creativity is essentially a simulation.

In Chapter Five I discussed the role of intuition and reflection. Accordingly, some studies indicate the importance of reflection in expert behavior (Schön, 1983; Charness et al., 2012). Other studies indicate the importance of intuition (Dreyfus & Dreyfus, 1998; Sennett, 2008). In terms of creativity, this study indicates that intuition primarily leads to the production of something that feels right, that is, something that is considered appropriate. Conversely, reflection, coincidence, or accidents are needed in order to produce something novel. Thus, even though such finding seems somewhat simplistic, the study provides interesting knowledge about the role of reflection and the role of intuition in creative processes.

13.2 Post hoc reflections on the validity of the research

A comprehensive number of methodological pitfalls are discussed throughout the thesis. Nevertheless I find it reasonable to address the methodological issues I consider most prominent and potentially disturbing in terms of the validity of the research. First of all, these issues are related to the identification of creativity and the definition and implications of expertise.

13.2.1 Is the focus of this investigation really creativity?

One of the main methodological issues of concern is whether the focus of this investigation is actually creativity. Naturally, from a grounded theory perspective this is not really an issue in the sense that the demarcation of creativity basically represents a deductive rather than an inductive strategy. Accordingly, questions of whether something is creative or not are primarily relevant if it
is somehow considered relevant from the perspective of the studied subjects. However, as the methodological approach is partly inspired by experimental studies, the question of demarcation is important. In this regard, the definition of creativity also enhances the possibility of making comparisons between this study and other studies within the field of creativity.

13.2.1.1 Is creativity captured in the study?

The first problem is whether the participants are actually performing creativity in the limited time they were given in the semi-experimental design. According to many accounts from artists and scientists, a creative process might consist of long periods characterized by no progress and no inspiration (e.g., Wallas, 1926). Thus, it seems obvious that the experimental design might only represent parts of a creative process. In the interview, the participants were asked to select the best element of their composition but that doesn’t necessarily imply that these elements can be automatically considered creative. In the case studies, it seems evident that some of the participants were more content with the final outcome of their composition than others. Thus, it is reasonable to question whether the case studies in general reflect creativity.

The weight of the objection described in the above depends on which understanding of creativity is applied. If creativity is understood as something extraordinary that only happens momentarily and infrequently, then the objection seems highly reasonable. On the other hand, the objection seems less problematic if creative processes are understood as something relatively regular. This approach is suggested by some of the main researchers referenced in this thesis, e.g. Amabile, Boden, Weisberg, Gabora, Johnson-Laird, and Craft. However, I have also included other perspectives that might entail another approach to creativity. Most importantly, the theory of blind-variation and selective-retention might indicate that creativity only happens momentarily. Both perspectives on creativity are essentially embraced in this thesis: on the one hand, the main assumption is that ordinary processes of creating in general reflect what might be identified as a creative process. On the other hand, it seems evident that creativity includes different phases and moments that are not necessarily represented in every ordinary creating process.

Naturally, a much more exclusive understanding of creativity could have been applied. However, that choice would have entailed explicit naturalistic and long-term research strategies instead of the semi-experimental designs applied in this thesis. Unfortunately such strategies would have
complicated the thick analysis of creative processes attempted here, exemplified by the adoption of video recording and ongoing interviews during the process of composition. Thus, the chosen design enables a microanalysis of creativity. Besides, I would argue that my thesis contains a substantial number of case studies and interviews whereby the chances of capturing creativity are improved. Still, the results of the study would naturally have been different if long-term investigations had been conducted. Thus, the interview with Cæcilie Trier clearly demonstrates that creativity on a long-term scale may include comprehensive processes of thinking, researching, and preparing before the actual music-making is initiated. Evidently, the present study is unable to account for such long-term processes on a detailed level.

13.2.1.2 *Are the evaluation groups constructing creativity?*

The second problem concerns the social construction of creativity. Thus, the problem outlined in the above is equally relevant in terms of the design of the evaluation: during the assessment the evaluation group was forced to evaluate music that they do not necessarily consider creative. Accordingly, one might question whether the attempted social construction of creativity is valid. Again, it depends on how creativity is understood. The findings are not valid, if creativity is conceived as something exclusive that is impossible to grade and therefore either occurs or doesn’t. However, the design is valid if creativity is understood as a regular phenomenon that might be graded in different ways. Still, it seems reasonable to question whether the findings in the study are relevant in terms of the most evident expressions of creativity, including so called big-C creativity.

13.2.1.3 *The balance between novelty and appropriateness*

The final problem concerns the balance between novelty and appropriateness. According to the theoretical framework outlined, creativity is understood as something novel and yet appropriate. In Chapter Four the relation between novelty and appropriateness was discussed and different balances and interrelations were suggested. However, the question is whether the balance offered in this thesis is reasonable. One might argue that the focus on novelty has been too strong at the expense of craftsmanship. This tendency might be related to common trends within society in general as presented in Chapter One, section 1.5.2. Thus, the focus on novelty rather than craftsmanship might be related to trends in the late modern world such as an explicit focus on innovation, originality, and individuality. Nonetheless, in the study design, room has been made for individual and social constructions of creativity. Thus, the construction of creativity is triangulated, which essentially
enhances the validity of the evaluation with regard to creativity. Consequently, the balance between novelty and appropriateness is investigated from different perspectives. Still, the focus on novelty is partly caused by my own idiosyncratic approach to creativity as described in Chapter One.

13.2.2 The understanding and implications of expertise

The definition and identification of expertise represents a challenge equally problematic as the definition of creativity discussed above. Thus, critical questions might be asked in terms of the way expertise is operationalized in this thesis.

In the study expertise is first and foremost viewed as a general entity. Thus, even though the case studies are examined qualitatively it has not been the main purpose to investigate different types of expertise and different types of learning processes. Accordingly, the implications of such differences might be overlooked. For example it seems obvious that different communities of practice, different types of education, and different processes of learning will affect creative processes in various ways. However, the ambition has been to address expertise as a general phenomenon. Nonetheless, a research project focused on the implications of different learning enviroments, communities of practise, etc., would probably lead to more subtle results.

Another crucial point of interest is the degree of expertise represented in the case studies. In the study I claim that I address a central notion within the field of creativity, known as the ten-year rule (Capter One, section 1.3.1). The experts in my case study all have more than ten years of experience. Thus, it would be reasonable to argue that they represent an appropriate amount of expertise suitable for the investigation of the ten-year rule. However, they are not professional musicians. Further, the degree of experience naturally also depends on the amount of daily practice, which obviously varies from participant to participant. Thus, it might be reasonable to ask whether the findings of this thesis are representative with respect to musicians with, say, twenty years of experience. For example, some of the experts in the case studies were criticized for lack of craftsmanship by the evaluation group. I doubt that this would be the case if the case studies had only included professional musicians. Nevertheless, I argue that the participants’ levels of expertise are suitable for investigations of some of the main notions within the field of creativity, as long as the research is not applied to all degrees of expertise.
13.2.3 The comparison between loops and instruments

In the last part of the music course, when the participants were working on their final composition, they were allowed to work in any way they want and include the instruments they found most suitable. Thus, apart from the fact that they had to use GarageBand or a similar kind of software, the constraints were limited. Accordingly, a relatively naturalistic setting was attempted in order to make room for the participant’s idiosyncratic strategies of composition (see Chapters One, Two, and Three). This method resulted in a scenario in which most of the novices applied loops and most of the experienced/experts applied musical instruments. Accordingly, one may argue that the two conditions are not comparable. However, such argument would be too simplistic. First of all, a relatively naturalistic setting enhances the external validity of the study. Second of all, the design of the music course also includes fixed sessions which allow comparison on more strictly experimental terms (see analysis in Appendix J). Finally, the participant’s adoption of different types of equipment and the implications of these choices is a matter of great interest in this thesis. In that respect, it is important to stress that creativity is approached as an individual phenomenon as well as a phenomenon distributed in networks. Thus, the different types of interaction between human and non-human actors seem crucial in order to understand how creativity unfolds.

13.3 Post-hoc reflections on the methodological approach

In the thesis I have argued that the balance between different research methodologies is a productive way to address the initial research question. However, the operationalization of this balance is not given a priori and might result in some challenges and unforeseen difficulties. In the following the methodological choices are evaluated, especially with regard to the eclectic research approach, the application of actor-network theory, and the seeming affinity between processes of research and processes of creativity.

13.3.1 The balance between different research methodologies

A balance between inductive qualitative approaches and deductive quantitative approaches forms the methodological core of the thesis. This twofold strategy entails a number of challenges that have been discussed throughout. Nonetheless, retrospectively I would like to make a final comment with respect to the structure of the thesis that concerns the discussed balance. The thesis contains different analytical chapters in which the main research question is addressed from different
perspectives. Thus, in Chapter Ten the approach is essentially qualitative whereas the approach in Chapter Eleven is partly quantitative.

This structure seems reasonable in the sense that the qualitative investigations are followed by more quantitative investigations by which the qualitative findings are addressed on a more general level. During this process, qualitative findings that seem to be representative on a general level are amplified. However, this procedure might give the impression that qualitative derived findings that are not representative on a general level are not valid. In other words, the structure of the thesis might entail a partial disqualification of the qualitative findings.

Naturally, I believe that the structure of my thesis is legitimate and also productive. Thus, I uphold my basic argument that it makes sense to address the main research question on a qualitative level and still look for some general implications. However, I do recognize that this double sight represents a challenge in the sense that qualitative in-depth analyses tend to get lost in the attempt to reach general conclusions. Accordingly, the final conclusions might appear more superficial and trivial. Nevertheless, I have tried to embrace and include general implications as well as single isolated findings in the thesis’s concluding chapter.

13.3.2 The ANT approach

The methodological approach in the thesis is inspired by ANT, but may not be seen as a strictly ANT investigation. However, I find it relevant to evaluate the methodological approach with respect to the particular principles suggested by ANT.

First of all, ANT suggests a balanced approach to human and non-human actors. On the one hand, the analysis stays loyal to such principles in the sense that the influence of non-human actors is included in the investigation. On the other hand, the attempt to understand the importance of expertise as a somewhat isolated phenomenon entails a partial isolation of the subject that may conflict with the basic notion about the comprehensive connections between material and human suggested by Latour. In the thesis such comprehensive connections have been implied with respect to the affinity between creative thinking processes and the digital interface. However, it has not been the object of the thesis to dig deeper into such connections. Instead the analysis relies on the belief that subjects act independently, even though they are intertwined with and influenced by
other actors. In turn, this principle is also in line with the suggestions of ANT in the sense that Latour encourages the researcher to interpret subjects as actors rather than passive placeholders.

According to the last principle, Latour stresses that the research must make room for the actors. In other words, the actors must not be seen as passive agents forced into abstract musings constructed by the researcher. In that respect, the voice, the words, and the reflections of the actors must not be seen as less valid than the researcher’s contemplations. In the research I have tried to stay loyal to this ideal, even though the principle is not necessarily easy to handle. First of all, it is I who asked the questions, designed the research, did the analysis, and finally wrote the thesis. Therefore, I am naturally in a privileged position regarding the perspectives adopted and the conclusions constructed. In other words, from an ANT perspective, I am an influential actor and not a passive agent when it comes to the construction of this thesis. Additionally, the initial research question might entail a certain kind of pacification of the actors in the sense that it leads to a focus on the implications of expertise rather than a focus on the actor as they appear in all their uniqueness. Nonetheless, in my analysis, and in my research as a whole, I have tried to follow the actors, their words, their concepts, their perspectives, and I have tried not to force them into narratives in order to fit my constructed framework. Yet, needless to say, the balance between the adoption of theoretical concepts and the inclusion of the studied actors’ own perspectives represented a challenge.

13.3.3 The affinity between the applied methodology and the creativity theory presented
A particular issue of interest is the apparent affinity between the methodological approach, the main research question, and the creativity theory applied. That is, according to grounded theory it is crucial to include unlikely sources of inspiration in the analytical work in order to discover and develop new knowledge. Further, it is suggested in GTM that former knowledge within the relevant field of research is partly left out, because such knowledge may hinder the emergence of new knowledge (see Chapter Two, section 2.2.1). Both principles are reflected in the main conclusions regarding expertise and creativity and in the creativity theory presented. First, the thesis suggests that former knowledge might in certain ways inhibit creativity. Next, a main part of the creativity theory applied indicates that creativity may be facilitated by unlikely inspiration that may move the creator in new directions.
According to the above it might be reasonable to ask whether I actually adopted the principles described. In other words, is the thesis characterized by the rejection of former knowledge and the inclusion of unlikely sources? The answer to this question might be only partly confirmatory. First of all, this thesis is based on the assumption that an exclusion of former knowledge is neither preferable nor possible in a research project like the present one (see Chapter Two, section 2.2.2). Thus, it has been the ambition to include former knowledge without letting such perspectives dominate the research agenda. Further, I have included all kinds of sources in the ongoing work of research. In that respect, I have additionally been inspired by the actor-network theoretical suggestion to keep track of all likely and unlikely moves of the researcher, presented by the ANT slogan ‘everything is data’ (Latour, 2005, p. 133). Yet, it is reasonable to ask whether the findings in this thesis would have benefited from a more explicit rejection of traditional perspectives within the field of research and a more insistent inclusion of unlikely sources. In this respect, I have to confess that the many perspectives provided by the comprehensive research field of creativity in some situations have represented a burden. That is, the former knowledge presented in the thesis may have pulled the perspective in specific directions and consequently repressed other surprising perspectives. Nonetheless, the ambition has been to go in new directions while still include relevant knowledge on the field.

13.3.4 The blind spots of the research

Needless to say, the research is focused on specific aspects, perspectives, and implications of creativity, technology and expertise. Accordingly, an infinite number of relevant issues and phenomena are not captured or addressed in the thesis. Naturally, all these aspects cannot be mentioned. However, I will sum up two issues of concern that I find essential. First of all, the specific understanding of creativity presented in the thesis leaves out other perspectives on creativity that would have pulled the investigation in other directions. Thus, the focus on interactions between human and non-human actors properly entails a partly neglection of psychological intrinsic unconscious mechanisms. Further, this focus properly entails a neglection of intellectual constructions of creative concepts and ideas, that is, what Cæcilie Trier refers to as ‘the composer as an architect rather than a gardner’ (Chapter Five, section 5.5.3). Second of all, the focus on the implications of expertise moves the perspective away from other relevant issues including questions of personality, talent, motivation, environment, etc.
13.4 Future research

In the thesis I have tried to examine the relation between expertise and creativity within a specific field and partly within a laboratory setting. Thus, the findings formulated in this thesis are based upon a specific type of empirical material that may not be applicable with respect to other fields and may not be equally valid outside an experimental setting. Consequently, in order to produce formal theory, as suggested within grounded theory, the findings needs to be pursued, examined and elaborated within other fields and by the use of other methodological approaches. Accordingly, suggestions for further research may primarily include further investigation of the findings reached in this thesis. From my perspective, three issues appear to be most significant and obvious to pursue.

First of all, the complex construction of creativity comprised by the different phases of creation and evaluation needs to be examined further. In the present study, I have tried to address the construction of creativity from various perspectives in order to link individual processes of creation with subsequent evaluations conducted by other people. This strategy entails interesting findings regarding the apparently limited connection between little-c and big-C creativity and the questionable connection between sender and receiver. However, this finding may be partly caused by the adopted laboratory setting. Hence, I find it relevant to investigate this issue further within a natural setting, e.g. among professional artists and their audience.

Next, the role of mistakes in creative processes seems surprisingly prominent in the case studies examined in this thesis. This finding entails a number of questions appropriate for further research. For example, it might be relevant to investigate whether mistakes occupy a particularly prominent role within a digital context. Further it might be interesting to investigate the relation between control and creativity. In the case studies control seems connected to reproduction rather than production. However, some of the interviews conducted in the thesis with professional artists and former students of the Academy of Music clearly indicated that total control may function as the road to creativity. For example Cæcilie Trier described total control as an unambiguous advantage in a creative process. Further, Jacob Lind-Lauritsen described how professional musicians develop a specific personal and unique way of playing that may be compared to a specific way of talking (interview, 2014). Hence, in such cases control seems connected to uniqueness and creativity. Yet,
this is not the result of the analysed case studies in this thesis which primarily included amateurs.
Thus, it would be relevant to investigate these questions among professional musicians.

Finally, pedagogical implications of the thesis’ main findings need to be pursued. Essentially, how is it possible to learn without adopting an entrenched perspective? How can notions of autonomy be addressed in a pedagogical setting? And what is the role of the teacher if only a limited amount of skills have to be learned?

13.5 The challenge of studying creativity

In the beginning of this thesis I described how creativity might be understood as an individual phenomenon as well as a phenomenon distributed in networks. Throughout the thesis it has been a constant challenge to balance between these two approaches. Evidently, the strategy has been to include both perspectives. However, it still feels as if the models of explanation are somewhat insufficient. The seeming problem might benefit from a return to the User Illusion written by Tor Nørretranders (1998), also discussed in Chapter Six. In the book, Tor Nørretranders emphasizes that the role of consciousness is not as dominant that people normally think it is. In fact, consciousness is a slave rather than a leader. The real leader is a complex network of nerves and cells rather than a single unit of thoughts placed in peoples’ brain. Thus the role of consciousness is in many ways an illusion. However, the crucial argument made by Nørretranders is that the network of nerves and cells is still representing human will even though it is not exclusively representing consciousness. Thus, human autonomy might not be associated with consciousness but rather associated with the network. In other words, human autonomy is not constituted by a single ontrol tower but is rather the result of complex processes taking place in a network.

Naturally, Nørretranders is preoccupied by the internal network within the human body and not the external network comprised of human and non-human actors. Nevertheless, the thoughts of Nørretranders might be transformed and applied in order to break down the walls between human autonomy and the network. Thus, my suggestion would be that we should try to find a way to embrace the network as well as the subject in the search for creativity. Further, I will suggest that individual agency is not seen as the opposite of an influential network. Needless to say, I have not really found this new path in this thesis. Conversely, the thesis strongly indicates that the
phenomenon of creativity is complicated and needs further investigation. Accordingly, besides the many attempt to define and understand creativity, the phenomenon still seems ambiguous.
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