

The modes of music information in a compositional process: a case study

Abstract

Purpose - The aim of the present article is to demonstrate an actual compositional process that entails a diversity of music information modes and describe the way these modes contribute to the creative aspirations of a composer.

Design/methodology/approach - The music information typology proposed by Rousi, Savolainen and Vakkari is used as a point of departure for defining the different modes of music-related information. First, relevant music information modes are identified from the composer-informant's verbal description of a compositional process. Then, their proportions and dynamics are examined.

Findings - The findings suggest that the music information typology may be applied within the context of musical composition, that is, all of its five modes of music information could be identified from the composer's verbal description of the compositional process. However, two additional significant information modes were identified: shaping music as the third mode of enactive representations and genuine iconic representations.

Originality/value - This study introduces a new mode of music information indicative of the artistic capacity of expressiveness: shaping musical structures as the third mode of enactive representations was the means whereby the composer made musical structures work for himself and hence created performative power in his music.

Limitations - The purpose of this case study is not to claim that the results regarding the significance of individual music information modes apply to all compositional processes within diverse genres of music.

Keywords – Information representations, Music, Musical composition, Music information, Musical semiotics

Introduction

For centuries the act of professional music composing has been held as pinnacle of creative music behaviour within the Western cultural sphere. Moreover, knowledge production 'in, through, and with art' (Borgdorff, 2011, p. 44) has been under an intensive debate in the recently emerged discipline of artistic research. However, little is known regarding the information substance of the act of musical composition. In his work on musical semiotics, Tarasti (1994) examines the different systems of description relevant to musical communication. According to Tarasti (1994, p. 4), musical knowing transpires within diverse sign systems of which some are inherently non-conceptual, such as gestural language of music making and aural experiences of music. It is not self-evident how these modes of music information should be defined when examining the information substance of professional music composing. Studying the information substance of musical composition could help to understand the complex creativity behind this quintessential music behaviour. Prior to the present article, studies focusing on information substance of musical composition have been scarce (see, however, Zembylas and Niederauer, 2018).

The present article examines the modes of music information reflected in contemporary classical music composer's verbal description of a compositional process. We define information in its broadest sense as various kinds of entities that are being learnt in a social context and are conveyed or represented by a particular arrangement or sequence of different kinds of things, which again may be objects, actions, events, or thoughts. The aim of the article is to demonstrate an actual compositional process that entails a diversity of the pivotal music information modes and describe the way these modes contribute to the creative aspirations of a composer. To this end, an explorative case study was conducted by drawing on the music information typology proposed by Rousi, Savolainen and Vakkari (2016) in order to examine the roles of music information of different kinds in one compositional process by a composer. The typology identified five modes of music information: music making as the first mode of enactive representations; music listening

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3 as the second mode of enactive representations; iconic representations of music; technological models of
4 music as the first mode of symbolic representations; and ideological models of music as the second mode of
5 symbolic representations. Once relevant music information modes have been identified from the composer-
6 informant's verbal description of a compositional process, their proportions and dynamics are examined. The
7 informant of the study was an academically trained Finnish composer engaging in modernistic aesthetics
8 within the Western art music tradition. The data of the case study consist of interviews and manuscripts that
9 were employed to track one compositional process of a professional composer in the studies of Pohjannoro
10 (2008; 2014; 2016). These studies also enable the process approach of the present article by providing a
11 framework for the review of the compositional process as comprising of three stages.

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13 The findings of the present article suggest that the above typology is fairly specific for the needs of
14 examining a real-life compositional process in that all five modes of information could be identified from the
15 composer's verbal description as relevant constituents of the compositional process. The findings revealed,
16 however, that the typology is not sufficient within this context as two additional modes of music-related
17 information relevant to musical composition were identified from the empirical data. In the composer's
18 verbal description, the enactive modes were reflected not merely as the corporeality of playing an instrument
19 and as mental representations of musical sounds but also as inventing and shaping musical passages, which
20 proved to be the pivotal form of information in the compositional process. Moreover, the reflections of the
21 iconic mode may comprise visual perceptions and drawings. The reflections of the symbolic modes may
22 comprise not only the verbal manifestations of musical tradition, such as analytical texts of aesthetics and
23 music history, but also as the whole notational work of creating several manuscript versions and the final
24 notated score of the piece.

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26 The rest of this article is structured as follows. First, the problem of what constitutes as music information is
27 discussed and the music information typology developed by Rousi, Savolainen and Vakkari (2016) is
28 introduced. Second, a literature review of related studies is presented and the research design of our
29 investigation is specified. What follows is the findings section where both the specificity and sufficiency of
30 the above music information typology are examined. Additional modes of music information are presented
31 and proportions of identified information modes within the compositional process are also examined in the
32 findings section. The concluding section presents a revised music information typology for musical
33 composition and discusses the findings and their significance.

34 **Music information typology**

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36 In their works on musicology and musical semiotics, Bengtsson (1977) and Tarasti (1994) examine the
37 different systems of description relevant to musical communication. According to Bengtsson (1977), the
38 concept of tone may refer to a notated tone, a measurable frequency or an aural experience. Tarasti (1994, p.
39 4) adds also the gestural language (i.e. performing music with instruments), which is needed to transform a
40 notated tone into both a measurable frequency and an aural experience. Musical knowing therefore transpires
41 within varied sign systems, some of which are inherently non-conceptual (Ibid.). Yet, according to Tarasti
42 (1994, p. 4), it is insufficient to state that musical knowledge is merely transmitted through the musical non-
43 conceptual sign systems. As no sign system works in a vacuum, but in interaction with other systems, also
44 verbal sign systems have had an important role in transmitting musical tradition (Tarasti, 1994, p. 4). The
45 mere multitude of differentiated information representations relevant to music poses a challenge to
46 approaching them in research focusing on information behaviour.

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48 The typology of music information (Rousi, Savolainen and Vakkari, 2016) used as a point of departure in the
49 present study was created by integrating Tarasti's (1994) music semiotic ideas with Bruner's (1967)
50 approach to modes of knowledge representations introduced in Bruner's book *Toward a theory of*
51 *instruction*. According to Bruner, any domain of knowledge and every single problem within that domain
52 can be presented to the learner through using the following modes of representation. *Enactive mode* of
53 representation refers to sequences of activities for creating desired results. *Iconic mode* of representation
54 refers to presenting a concept through a graph without exhaustively defining it. Most abstract of the modes is
55 the *symbolic mode* where through a system that defines rules of expression, a set of arguments is created for
56 describing a concept. (Bruner, 1966, pp. 44–45.) The proposed typology further defined the content of
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Bruner's modes within the domain of music by positioning sign systems relevant to music presented by Tarasti (1994) in *Theory of musical semiotics* into them, which led into altogether five following modes of music information (Rousi, Savolainen and Vakkari, 2016).

- *Music making as the first mode of enactive representations* refers to information resided in different sequences of actions that produce sounds for musical purposes. This action may appear in varied forms, such as playing the violin, singing or creating electronic music with a computer.
- *Receiving music as the second mode of enactive representations* refers to listening to musical performances, while being present at a live performance or through a recording, without the control over the performance's sonic results.
- *Iconic representations of music* refer to graphic illustrations presenting music-related information, such as a piece of music presented in modern staff notation.
- *Technological models of music as the first mode of symbolic representations* refers to examining structures of music, i.e., tonal organization of harmony and counterpoint and sonic formulae of orchestration and interpretation through symbolic means such as written language.
- The most abstract category of the typology is *ideological models of music as the second mode of symbolic representations*. This mode addresses music at a symbolic level but not directly the qualities that transpire in music *per se*. In this mode conceptual symbolism regarding music are negotiated with other fields and their conceptual symbolic representations. For example, it is possible to produce narratives on concepts such as 'western classical music' and 'history' or 'music' and 'aesthetics' without reference to actual phenomena present in sonic reality of music.

The typology's purpose is not to exhaustively classify phenomena as belonging to one category alone, since the position of approach plays a crucial role in providing the angle through which the different categories transpire. For example, the first symbolic mode, which examines harmony and counterpoint, and other musical parameters, and the second symbolic mode, which reviews aesthetics and history music, are no separate entities. The technological models of harmony and counterpoint are closely weaved with the history of Western art music, for example (Tarasti 1994, p. 17). As the above typology was originally intended to be used to categorize information sources in studies of information seeking, its modes of music information need to be further operationalised for the purposes of this study. These operationalisations are presented later in the research design section of this article.

Related studies

So far, Information Science lacks studies examining musical composition processes from the viewpoint of information substance. Information behaviour of professional composers has also been rarely investigated, with few exceptions, such as Hunter's (2006) study of electroacoustic composers. As with latter studies and those regarding information seeking of music scholars (Brown, 2002) and performing musicians (e.g., Kostagiolas *et al.*, 2015), the approaches so far have been based on second hand information sources, such as literature and audio recordings of music. Source-based approaches are often limited as they do not reveal how previously acquired knowledge and musical experiences affect creative musical processes. Moreover, the notions of information of previous studies are one-dimensional in that they omit the roles of the diverse modes of music information in these processes.

In composition research, the focus has usually been on the musicological and behavioural aspects. Each discipline has their specific targets: musical parameters and sketches (musicology; Donin, 2009; Donin and Féron, 2012; Roels, 2016), individual or group processes of novices or experts (music education; Barrett, 2006; Burnard, 2012), thinking processes and problem solving (psychology and cognition; Collins, 2005; McAdams, 2004), and divergent behaviour, insight, and imagination (creativity research; Bailes and Bishop, 2012; Hargreaves, 2012; Katz and Gardner, 2012; Wiggins, 2012). Few studies have concentrated on the actual information substance of composition by asking: what is being tackled when composing, what kind of information is being processed and created? The substance of composition is mostly reduced to concern the (notated) musical materials and structures on the one hand and the composers' impetus, and sources of inspiration at the beginning of the process on the other hand, whilst the compositional process in its totality, and the ways in which the different kinds of impetus is utilized are more or less overlooked.

Katz and Gardner (2012) found two sources of inspiration in compositional thinking: ‘within-domain’ processes comprised musical ideas and ‘beyond-domain’ processes, which were inspired by extra-musical metaphors and associations. Mountain (2001), based on composer’s interviews and writings, categorized different sources of composers’ inspiration and musical imagery into auditory, visual, multi-modal, kinaesthetic (e.g. dance), cross-modal, sound effects, and mixed metaphors that may sometimes attain ‘the real world’. Roels (2016) organized the compositional ideas of eight professional composers into four levels of musical abstraction, the first three of which were musical (from structures and pitch systems to pitch, harmony and timbre) and the highest abstraction level being extra-musical (emotion, philosophical ideas, actions and theatrical ideas, visual images). Pohjannoro (2008) demonstrated the ideatic work of both musical and extra-musical ideas that incorporated all source types of inspiration identified by Mountain’s (2001) study: aural, visual, auditive-structural, and philosophic-conceptual. Zembylas and Niederauer (2018) establish a system of compositional knowledge that encompasses practical and discursive knowledge, based on a collective case study of five composers. However, the interview data of their ethnographic study only partly covered compositional thinking as the focus was on the professional conditions of composers’ artistic agency.

Research Design

Research questions

To investigate the modes of music information in one of the quintessential forms of musical behaviour, composition, the present paper addresses the following research questions.

- RQ1. To what extent is the music information typology presented by Rousi, Savolainen and Vakkari (2016) specific and sufficient enough in describing the modes of music information present in a composer’s verbal description of his compositional process?
- RQ2. What are the proportions of identified music information mode instances per stages and phases of the compositional process and what are the roles and dynamics of such modes within the process as a whole?

By *specific* (in RQ1), we mean the extent to which the above music information typology is capable of describing the musical compositional process. Moreover, by the phrase *sufficient enough* (in RQ2), we refer to the extent to which there is a need to elaborate the typology by adding, modifying or deleting elements for the purpose of more detailed and apt description of the modes of information present in the compositional process examined in this article.

Data collection, handling and coding scheme

Our study utilizes empirical data to track one compositional process of a professional composer reported by Pohjannoro (2008; 2014; 2016). This rich data was considered yielding answers to the research questions of the study at hand. The informant of the study was an academically trained Finnish composer engaging modernistic aesthetics, whose professional career in the national and international Western classical music scene continues to be active since for over 30 years. The data were collected in the composer’s studio between December 2004 and March 2005. The interviews were made using the informant’s manuscripts as memory triggers to enhance his ability to remember the thinking process that produced them. This kind of *stimulated recall interview* technique is widely used in order to track thinking on action, without *thinking aloud* procedure that would disturb the process, especially the lengthy ones (Perkins, 1977, 1981, pp. 13–18, 36–37; Ericsson and Simon, 1993[1984], p. 106; Lyle, 2003; Collins, 2007). To minimize memory-related biases (Schwarz, 2007), the interviews in this study were conducted within a fortnight of the actual events. Further, the informant’s reactive behaviour was carefully monitored (Nisbett and Wilson, 1977; Ericsson and Simon, 1993 [1984]) during the interviews, the composer’s attention to the concrete manuscripts and to their specific points of interest was steered to avoid accounts of how he typically operates or how he thinks he should operate.

The verbal data comprise 12 interviews (406 minutes and 29,000 words of verbatim transcripts). The manuscripts include 4 material matrices, 11 sketches, and 17 score versions. All of the data, including the copies of the manuscripts, are in the possession of the first author, with the consent of the composer-informant.

The composition that was completed during the research process exemplifies a typical professional task of composing a commissioned instrumental piece without text or any extra-musical reference. The piece is a 15 minutes' quartet in three movements for percussion instruments. The movements of the complete composition are as follows:

First movement: T_1-S_1, T_2-S_2 ;

Second movement: $T>S, T>S, T+S$;

Third movement: m_0-m_1-M .¹

The first movement is formed in a classical periodic ABAB structure, where the basic materials (called *T* and *S*, see findings) are introduced and developed. The second movement introduces transitions between *T* and *S*, culminating in the total fragmentation of both. The third movement is a coda-like contemplative progression of *S*'s melodic element, *m*, into the full melody, *M*.

The operationalisation of the music information typology in the verbal data, before redefining the typology (see findings section) has been done according to the following guidelines. The guidelines were constructed during the process of analysis and consummated together with the established new information modes, which is described in the Data analysis section. The new information modes identified from the empirical data are presented later in the Findings section.

- *Music making as the first mode of enactive representations.* The composer ponders about instrumentation or the playing technique of a musical instrument or speaks about a musician playing that instrument. How is this musical figure or section going to be played, how does the musician execute the composer's intentions indicated in the notation?
- *Receiving music as the second mode of enactive representation.* Because of the sensual character of this category, which is difficult or even impossible to verbalize, instances with a persuasive suggestion of involving a sound image are coded in this category. The category is most evidently present when the composer listens to his music in his 'mind's ear', or takes the stance of the listener. He may also refer to the tone colour of a tone or a passage, speak about the character of the music, or about how 'things distinguish themselves' (how a particular musical gesture may be perceived as a whole, distinguishable from its surroundings). Utterances about how a passage 'appears', 'takes shape' or shapes usually are interpreted as conveying sound images. However, when 'taking shape' refers to a larger unity or gestalt, the utterance is not coding in this category but in the new category of the third enactive mode (see findings section).
- *Symbolic-iconic representations of music.* The original *iconic representations of music* category presented in Rousi, Savolainen and Vakkari (2016) has been renamed as the symbolic-iconic representations of music. According to Goodman (1968), musical notations have strong symbolic elements, and only part of western art music notation is iconic. This category is all about writing musical notes (including rehearsal numbers of the score, performance instructions of different kinds, be they visual crescendo or diminuendo wedges or verbal expressions), or operating with the computer program. Many of the utterances in this category include episodes where the composer gives explanations to the scholar about the practical decisions on how to organize the space in the bars or which passages have been moved into where.
- *Technological models of music as the first mode of symbolic representations.* In this category, music is considered within music analytic-theoretic setting, in terms of musical structures or parameters (rhythm, melody, harmony, timbre, dynamics). The composer speaks about music that has already been composed (either into the score or intellectually in the composer's mind though not necessary written down yet), and the composer inspects what has been done, mostly without specific analytic terminology.

- *Ideological models of music as the second mode of symbolic representations.* The composer refers to conceptions or individuals in music history: what has been done in music before, or is done concurrently, which composer has been doing things alike, or how does the piece at hand, or a section of it relate to a certain aesthetic principle. When the composer refers to a common aesthetic principle, such as minimalistic aesthetics, or organic growth of the thematic material, the ideological model applies. The ideological category was differentiated from the technological category regarding their level of abstraction: utterances conveying ideological models refer to music as a psychological, sociological, historical, aesthetic phenomenon, whereas the technological category bears a closer relationship to notated or performed music. In the context of the modernistic (post-serial) disposition of the composer of this study, the compositional techniques of the past are coded into the second symbolic mode.

The compositional process

The present article utilizes the framework of the compositional process comprising three compositional stages that form altogether 18 compositional phases (substages), established through data-oriented approach in Pohjannoro's studies (2008; 2014; 2016). In the first compositional stage ('ideas'; phases I–V) the composer created the germinal ideas, materials and the formal structure of the piece and embarked on the score writing process by writing the first sections of the first movement. The second stage ('crisis'; phases VI–XI) was the active period of artistic ventures with proliferating compositional problems, a crisis and its resolution, the third stage ('adjustment'; phases XII–XVIII) being a smooth but tiresome endeavour of completing the piece. The details of the compositional phases and stages, their dates and the respective manuscript data are presented in Appendix 1.

Data analysis and validity issues

As noted above, the empirical data were gathered in 2004–2005, that is, about 13 years ago. However, the data are valid for the particular needs of the present investigation. All the empirical material was available in its entirety for re-coding and re-analysis. The empirical data are not outdated because each creative (art) process on the one hand produces an original and unique output thus being totally non-repeatable and on the other hand creative processes tend to change slowly as well as in an unpredicted way (Gruber and Wallace, 1999). Moreover, it is evident that due to their generic nature, the modes of music information identified by Rousi, Savolainen and Vakkari (2016) are relevant to the analysis of the compositional process, independent on a particular date when empirical material about this process was collected. The qualitative content data analysis was conducted as follows. First, the verbal data were segmented into data units and identified according to the modes of the coding scheme by the first author, within the framework of the compositional stages and phases (established in Pohjannoro, 2008; 2014; 2016). Here, the cross-validation of the verbal and manuscript data, each of which were unintelligible without the support of the other, was crucial. Next, the preliminary coding was assessed together with the composer-informant and the first author. As a result of the member check validation performed by the composer, the theoretical framework was modified by adding two new modes of music information to the original typology, which again prompted resegmenting and recoding, as well as identifications of previously problematic utterances. These additional information modes will be discussed later in the findings section. The coding scheme was also amended respectively. Finally, clarifications to the coding scheme were made on the basis of the second author's comments about the correctness, congruency and intelligibility of the comprehensive coding decision lists of all information modes. The length of the identified utterances varied from a couple of words to several sentences. Eventually, a total of 718 of the composer's utterances were identified to reflect a mode of music information.

Musical composition, combines a manifold set-up of sources, types, and operation modes of information (Donin, 2009; Donin and Féron, 2012; Pohjannoro, 2008; 2014; 2016; Roels, 2016; Zembylas and Niederauer, 2018, pp. 80–110). Identifying and discriminating the different information types in the verbal data is challenging, first due to the complexity of the phenomenon with the theoretical overlaps in its conceptual-theoretical frame, already mentioned. Second, the nature of the verbal data inducing artistic creation is bound to encompass multifarious information that is difficult or even impossible to verbalize.

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3 Thus the problems of ineffability may have reduced the amount of sensory and other experimental aspects of
4 compositional information (Pohjannoro, 2011). In summary, despite the manuscript data cover all of the
5 composer's sketches and manuscripts (according to the testimony of the composer-informant), the verbal
6 data are to include but a fraction of the compositional thinking during the whole process. The fractions most
7 likely left uncovered are the thoughts that simply were forgotten or were for another reasons not discussed
8 during the interviews and thoughts and experiences that could or would not have been verbalized.
9 Furthermore, the fact that the piece under scrutiny represents music without text, program notes or such
10 (often referred to as 'absolute music', i.e., music in its most abstract and non-referential form) may highlight
11 the instances in the compositional process that reveal the use of any extra-musical and symbolic information.

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13 Consequent to the above reservations, the qualitative content analysis process, regarding both the original
14 and the established new modes of information, was neither linear nor equivocal, but cyclical and iterative.
15 Within one sentence the composer might picture a visual image attached to audial ideas that again were
16 verbalized with music theoretical terms, maybe even within a historical context. The manifoldness of the
17 data induced further segmentation of the utterings and overlaps between the data units, apart from the
18 continuous differentiation and delineation of the operational definitions and the coding scheme. Overall, a
19 consensus between the researchers and the composer was pursued regarding the coding of utterances.

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21 In order to examine the proportions of music information modes per stages and phases of the compositional
22 process, the information mode instances identified in the data were placed into the compositional process
23 framework (Pohjannoro, 2014; 2016) based on their location in the timeline of the verbal data (see Appendix
24 1). Although the number of observations was 718, there were not enough cases per cell for statistical testing.
25 Therefore, and because of the qualitative case study design, descriptive statistics are given with the different
26 compositional acts as variables according to the identified compositional stages and phases, under the
27 support of the qualitative analysis of the critical compositional episodes within each phase. The micro level
28 (phase-wise) analysis is included because of the inner versatility between the information modes within each
29 stage (see findings) that nevertheless supported and substantiated the macro level (stage-wise) conclusions.

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31 The purpose of this case study is not to claim that the results regarding the proportions of individual music
32 information modes apply to all compositional processes within the diverse genres of music – even within this
33 particular genre or within the different processes of the informant in this particular study. The proportions of
34 these qualities may vary in proportions with regard to different genres and traditions (e.g. jazz or popular
35 music with their little use little written notation), compositional purposes (absolute vs programme music,
36 *Gebrauchsmusik*, etc.), individual characteristics and preferences (e.g. different typical sources of
37 inspiration, synesthesia), just to name a few instances. However, in terms of analytical generalization (Yin,
38 2009, 38–39), this study demonstrates an actual compositional process that entails a diversity of the music
39 information modes and describe the way these modes contribute to the creative aspirations of a specific
40 composer. Acknowledging the rareness of previous studies, this approach is thought to yield compelling
41 results which adds to understanding of the complexity behind the information formation in musical
42 composition.

43 Findings

44 *The enactive modes: Playing and listening to sounds*

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47 From the standpoint of a composer, music must be notated and instrumented in a way that the musicians
48 know how to use their instruments to convert the score into live sounds. As stated in the coding scheme, the
49 composer's consideration over how a certain musical passage could be executed, or his pondering about the
50 instrumentation, instrumental techniques or idiomatic playing indicated the *first enactive mode* (music
51 making). The data showed that musicians actually possess a virtual presence in the composer's studio, as the
52 utterances reflecting the first enactive mode comprised 7.1 percent of the total verbal data.

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54 The next citation exemplifies the composer using his knowledge about tom-tom playing technique. The
55 target was the actual playing actions of the percussionist and how the very fast tempo makes it impossible for
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him or her to change the mallets and again how this state of affairs prohibits the composer to change the tone colour (through changing the mallets), unless he would add some rests to the tom-tom part:

Composer (C): Except that this first movement will continuously run so fast that there will be no time [for the percussionist] to change the mallets. Unless one somehow gets a break.²

Keeping in mind that the composer intends his music to be received, listened to, it is not surprising that 15.6 percent of the data represent *the second enactive mode* (receiving music). In order to anticipate how his music sounds before it is rehearsed or performed, the composer envisioned sound passages, both imaginary and already notated ones, in his 'mind's ear' (i.e. with inner hearing). Reading or writing notes may induce the respective sound image into a professional composer's mind due to education and experience. Apart from using his mind's ear, it is known to the interviewer outside the data that the composer also used MIDI playback to create an approximation of the sound image. The data suggest that musical imagination, where novel sounds and passages may pop into the composer's mind, may work unexpectedly in quite mundane circumstances, as in the next citation where the composer reported about the appearance of one of his germinal ideas of his percussion piece (emphasis added):

C: For example, the other night I was late at work and went to take a shower. Suddenly, an idea about a *dense repetitive field of sounds with rhythms diverging* out of it popped into my head for the percussion piece. *It came with an image of a tone colour.* It was an *idea with a kind of sonic image attached to it.*

The following citations exemplify the composer's common work with sounds and sound images, which often were aspired to create a certain kind of character, impression, mood, or tone colour. Also, the style in which the composer verbalizes his perceptual experiments with musical instruments (the first enactive mode) and analytical accounts (first symbolic mode) can be discerned:

Interviewer (I): Were you about to say something else about those images of tone colours?

C: One is, for instance, these... Like tom-toms played with different kinds of stick. [1st enactive mode] Like, sort of like a basic drum sound. [2nd enactive mode] What kind of variations one can find out of it... [1st symbolic mode] Somehow I take interest in those kind of sounds that are only partly sonorous... ... [2nd enactive mode]

I: Like between a noise and a tone?

C: Yes. In the way that there is no exact pitch. [1st symbolic mode] But there is some kind of sonorous element in it... ... Somehow in-between. I just find those kind of sounds beautiful... [2nd enactive mode]

The symbolic modes: The symbolic-iconic mode, the first symbolic mode, and the second symbolic mode

The verbal data included 12.1 percent utterances manifesting the *symbolic-iconic mode* (notating music), which is the third frequent information mode. Here, the focus was on the utterances regarding the notational apparatus of the composition at hand. In quite many cases, the composer merely explained practical things about the whereabouts of a certain passage that he was elucidating, about the layout of the score ('I don't know if that space for one second is too small, I mean graphic-wise, those bars might be too narrow for this group of notes. One cannot show such quick things within that space.') or about the notation program he was using (emphasis added):

C: First *I wrote like this* [shows] and then I noticed that there was *too little space there and I wrote it again here like this* [shows]. Basically, it *has the same rhythms but in a different time signature.* *Finale* [notation software] *helps* within these kind of issues because one can *copypaste everything and then change the time signature.*

The data suggest that notating seldom seems to be elementary for the composer. Instead, rather than being mere notational information notation encompasses other information modes. First, as already discussed, writing musical notes induces the sound that the notes stand for and even the instrumentalist the notes are addressed to. Second, with their role of externalizing musical ideas and thoughts musical notes facilitate the

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3 compositional process. Whenever the composer wrote something down, he was persuaded to rethink his
4 ideas and many times the passage that was written down was somewhat different from what it had been
5 before:

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7 C: This is typical for me in a way so that when I write this kind of handwritten thing with the computer
8 the BEGINNING [louder tone] stays as it was more or less.

9 I: Yeah, these three gestures.

10 C: And then the rest of the passage gets going and becomes different.

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12 By the operational definition, *the first symbolic mode* (technological models) refers to the composer's
13 analytical renderings and interpretations of musical passages that have already been composed. A total of
14 10.6% of the data were interpreted as including utterances regarding the first symbolic mode. The composer
15 seldom used music theoretical vocabulary *per se* in the verbal data. However, many of the analytical
16 observations of the piece at hand were described in more mundane terms. The first citation exemplifies the
17 first symbolic mode with analytical terminology while the next one holds to everyday expressions (emphasis
18 added):

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20 C: *There are two [rhythmic] inversions, as analogous to melodic inversions. In the way that there is a*
21 *value indicating the amount of semi-quavers given to every duration. A semi-quaver equals one, a*
22 *quaver equals two, and so on. A rhythmic inversion doesn't work [may not be perceived] like a melodic*
23 *one, of course. So, all this all is speculation, really.*

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25 C: [Sigh.] These two sections [pointing to the first two versions of the second and third movement of the
26 piece in a manuscript depicts the outline of the whole piece] and nothing else. They are *in a way reverse*
27 *to each other. They really do not end, however, in the meaning of going back to the beginning or to*
28 *returning to some original thing or something that has been there before, to some normal situation. The*
29 *differences between the second and the third options are that in the second one both of two sections*
30 *begin with the same time that it ends. But in the third one they end in a different way than what they*
31 *began with.*

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33 *The second symbolic mode* (ideological models) comprises but 5.0 percent of the data. The data discloses
34 traces about discursive knowledge about philosophy and music history (e.g. names of composers, such as J.
35 S. Bach and John Cage, stylistic features, such as the medieval compositional technique called 'hoket',
36 which he employed in the third movement of the piece); the composer even revealed that he occasionally
37 writes poetry concerning concurrent compositional ideas. One of the key compositional endeavours of the
38 composer establishing an extra-musical or music philosophical agenda was the investigation of musical time
39 and the different ways time can be experienced through music. The two contrasting conceptions of time are
40 represented through the two basic materials of the composition, the material *T* representing linear time and
41 the material *S* representing space time (i.e. cyclic time). The expressions that articulated an aesthetic
42 principle, were seen to reflect the composer's affiliation to various artistic tenets and thus representing the
43 second symbolic mode. The next citations display the aesthetic principles of material coherence, the organic
44 development of material and form and finally the rationalizing principle of the nature (emphasis added):

45 C: One aims to stick to sort of *cohesive thinking*.

46
47 C: These ideas sort of have to be in some kind of... Or not just in some kind of but they HAVE TO be
48 *connected with the idea of the whole piece*, to the overall progression in the piece. And to the Identity
49 Idea of the piece, what this is all about.

50
51 C: *Nature is not so very simple*, either. It looks simple, but all the way it escapes any defining.

52
53 *The modes added to the model: The iconic mode and the third enactive mode*

54
55 The analysis of the empirical data revealed that the typology proposed by Rousi, Savolainen and Vakkari
56 (2016) is not sufficient to cover all modes of music-related information used in the compositional process.

Therefore, based on the empirical findings, the typology was substantiated by incorporating two new modes of music-related information: the *iconic mode* and the *third enactive mode*. The iconic mode of the original typology of Rousi, Savolainen and Vakkari (2016) was renamed as the symbolic-iconic mode. This is due to music notations comprising mainly symbolic and only partly iconic elements (Goodman, 1968). Moreover, the empirical data of the present article were thought to include more genuine iconic representations, which are described next.

The utterances that reflected the new iconic mode were fourfold. Firstly, many of the germinal ideas of the composition were visual. The composer described characters (e.g. tone colour) of the future piece at a very early stage in the process, when not yet a note had been written, with the expressions ‘whiteness’, ‘glacier’, ‘sculpture’, ‘like a fresco’. Secondly, the visual faculty provided metaphors of comprehension or aesthetic evaluation for the composer. The composer sometimes used the verbs ‘seeing’ or ‘looking like’ in the sense of making compositional decisions or assessments: ‘I really couldn’t say how it helps. It’s like it looks like ok.’ ‘Seeing’ could also refer to understanding something, usually grasping a big picture. Thirdly, mental visualisation was a tool for memorizing things. In the next citation, the composer reminisced about his germinal idea of a fresco and pointed out its purpose of remembrance. ‘Perhaps it [the visual image of a fresco] is more to help to remember the idea than in to transform some visual thing or occasion or place or some other matter into music.’ While preparing to write the final third movement of the piece, the composer spread the printed paper sheets of the whole manuscript so far over his large work surface to apprehend a whole picture of what had been done and what was more there to be done (emphasis added):

C: It is because I want to *see the whole picture*. And how these passages differ from each other, if they do so. Somehow I think it’s easier to *comprehend the whole thing when I see it*. Of course, when one *looks at it when sitting this far away the table, one can’t see very precisely without reaching out*. But one can *recall it*. And on the other hand, one also can *see what’s missing*.

Fourthly, the composer used drawings to visualize the formal structure of the piece, as illustrated in Figure 1, or to design some other musical parameter, such as melodic contours or dynamic changes. Nearly all of the sketches and many of the score versions contain drawings other than musical notes. The composer also reported that he sometimes even tries to paint his visions and moods that entail them, but that they never work out quite as expected. Drawings were used both to design or restructure musical structures and progressions and to help to comprehend and memorize the big picture, as already discussed concerning mental imaging.

< insert Figure 1 about here >



Figure 1. This very first manuscript of the piece exemplifies the function of visualizations in shaping the formal structure of a piece. The composer outlined the formal structure of the whole piece, which was at the time perceived as a one-movement structure.

In the member check validation procedure, the composer consistently refuted certain utterances to represent any of the modes of information in the original typology. Though these expressions often concerned music-analytical issues, they were, according to the composer, neither analytical apprehensions about the parameters or structures of musical events and passages, nor deliberations about the notational issues of how to transcribe sounds and musical ideas into notation, or aesthetical judgements. Instead, these utterances were identified as the composer shaping musical ideas and structures and experimenting how the music should proceed and what kind of impact it would make: ‘I’ll put in this thing and see how it looks like.’ Further, this mode incorporated the composer organizing his compositional actions in terms of metacognitive acts: evaluating (‘is this ok’, or ‘does this passage belong to this piece’), setting musical goals (how a certain passage should sound or develop), or making operative plans (e.g. expressions related to problem solving or planning what to do next, exemplified in utterances such as ‘What I will do is that... First I will outline the beginning and then the ending and after that what comes in between’). These kind of utterances conveying the habitual compositional gestures of expressive aspirations and metacognitive actions (‘This is what I do when I compose’, as expressed by the composer himself) were seen to establish a new mode of information, *the third enactive mode*, which was prevalent in the verbal data: 44.6% of all utterances.

The utterances representing the third enactive mode often included vocabulary that is motivated through the expressions of motion and movement, departure and arrival, transition and transformation. Indeed, the composer wanted the music actually to do something: he was shaping the performative power of music. In the following citation, the composer utilizes the third enactive mode of information to realize his aspiration to make the music work through its performative power (emphasis added):

C: It’s just an experiment like this. It is one *starting point* chosen for this piece.

I: Why?

C: It’s because... I just don’t want it that way. It acts against this space-time idea. Or I feel it is. I just have these kind of things with different durations, which *come about*. It’s there just to articulate... I have these concurrent incidents that in a certain way create an image or an occasion of *getting* to some point and *leaving* from there. They are those where a gesture *ends* and another gesture *begins* and where a single sound that is different from those two other gestures has been added to the moment of an

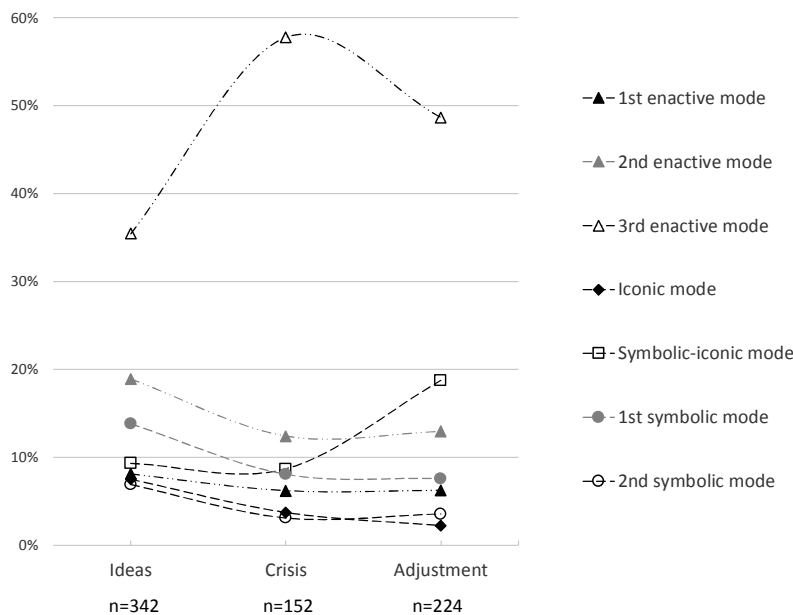
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3 *encounter*. I mean that certain *continuity* was about to in the *movem...* in the *transition*, where one
4 *gesture comes after another*. An empty space took shape and I was not happy about it. Something was
5 missing.

6
7 It should be pinpointed that aesthetic decision making as an important compositional device is most often
8 coded into the third enactive mode, instead of the second symbolic mode: then the aesthetic scheme is but
9 vaguely expressed (“this is ok”; “this works”; “it feels fine”), and targeted on a definite section or passage in
10 the emerging piece. Only when the composer refers to a common (discursive) aesthetic principle (such as
11 minimalistic aesthetics, or organic growth of musical material) the ideological mode applies.

12 *Dynamics of the modes*

13
14 From the viewpoint of the modes of music information identified in the composer’s verbal data, the
15 compositional process of this study is not a monolithic entity, but shows interesting variety. All of the three
16 compositional stages form a distinct profile in terms of their distributions of the information modes (see
17 Figure 2). The stage-wise and phase-wise percentages of the information modes were segmented according
18 to thought units and coded to identify information mode instances which varied from a couple of words to a
19 couple of full sentences. The different distributions of the information modes between the various stages and
20 phases reflect the distinctness of the compositional acts by the composer during the different points of the
21 compositional process, as represented in the verbal data.

22
23 < insert Figure 2 about here >



45
46 Figure 2. Proportions of modes of representation within 3 compositional stages (n=718; the lines between the
47 discrete observations are drawn only as illustrative points.)

48
49 During *the first stage* (ideation) the composer created the germinal ideas of the composition, consolidated a
50 loose conception out of his germinal ideas, then created the main musical materials of the piece,
51 systematically explored this material, and finally begun the concrete composing by writing the first section
52 of the first movement of the piece (T₁–S₁). Although the proportion of the third enactive mode prevails all
53 over the compositional process, it is the least dominant during the first compositional stage. Respectively,
54 the proportions of all other modes, with the important exception of the symbolic-Iconic mode, are at their highest
55 in the first stage, their proportions afterwards being descending.

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3 *The second stage* (crisis) is characterized by accumulated problems, which the composer was unable to
4 resolve. Nonetheless, the composer continued to proceed with the first movement of the piece, leaving
5 unanswered questions and empty bars behind, until a crisis arose during the composition of the second
6 movement. After a lengthy incubation and deliberation period, the composer was able to settle the crisis by
7 solving one problem after another in a fairly straightforward way. In the second stage the proportion of the
8 third enactive mode reaches its top, while the other modes become less significant.

9
10 During *the third stage* (adjustment) the composer refined and completed the work in an effortless and nimble
11 way, without anguish. In the adjustment stage the third enactive mode becomes less significant though
12 retaining its prevalence over the other modes. The proportional curve of the symbolic-iconic mode reaches
13 its top during the third stage, making the trends of these two modes contrasting to each other. The fact that
14 the curves of all the other modes either pretty much remain the same or decrease (iconic mode) accentuates
15 the growing significance of the symbolic-iconic mode. This growing significance of the symbolic-iconic
16 mode at the final stage comes as no surprise, as the notation of the piece is often considered as the primary
17 outcome of a compositional process and a prerequisite for the orchestral performance of the piece.

18
19 In the next, the interconnections between the proportional trends of the different modes will be examined
20 more closely, in terms of the different compositional phases (substages). First, a parallel trend between the
21 first and the second enactive modes can be observed (see Figure 3). As already discussed, a natural
22 explanation to this is that the information about a musical instrument quite naturally implies the sound image
23 of this instrument for the composer, and vice versa. Whenever the one is utilized the other is induced, more
24 or less.

25
26 Another parallel trend can be detected with the second symbolic mode and the collateral first and second
27 enactive modes (Fig. 3). This matching trend is especially evident after the compositional phase IX where
28 issues regarding the singular, far-reaching aesthetic-ideological choices, have been done. After these
29 fundamental aesthetic-ideological choices at the beginning of the process, more cognitive space is released in
30 the later parts of the process for 'smaller size' aesthetic-ideological questions that entail the first and second
31 enactive mode: 'how this would sound' and 'is this playable'. These kinds of considerations would be
32 particularly eminent when refining and completing unfinished sections in the late phases of the process.

33 < Insert Figure 3 about here >
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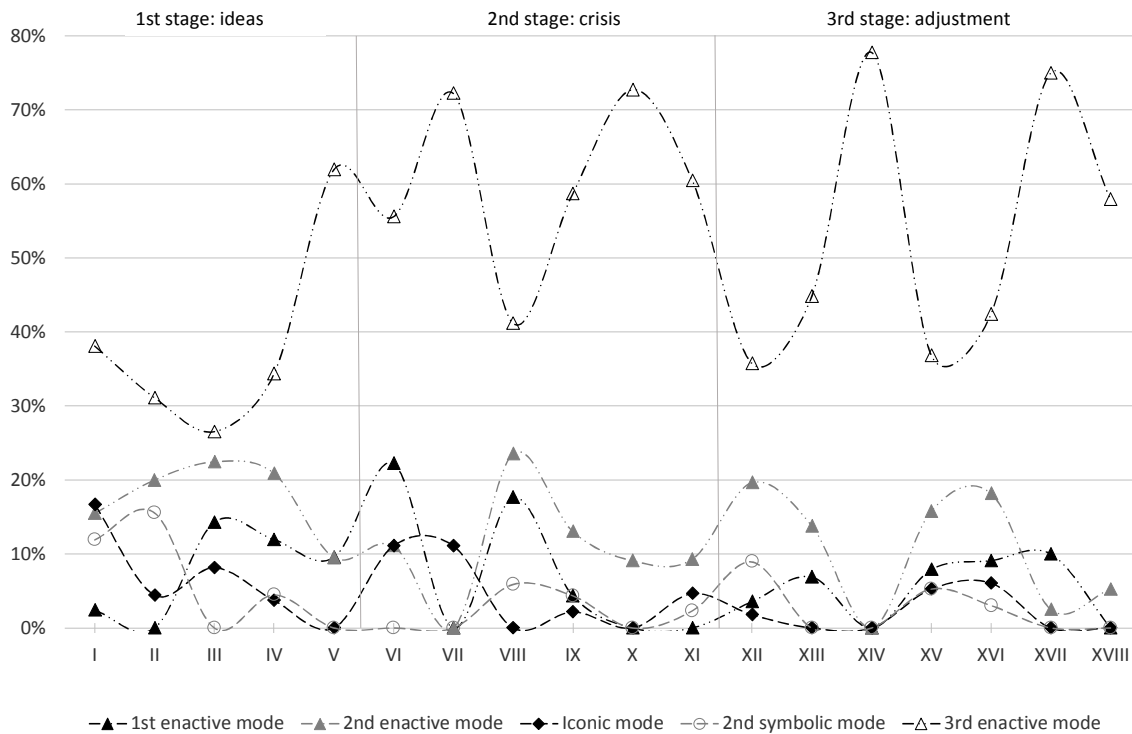


Figure 3. Proportions of the first and second enactive modes (making and receiving music, respectively), iconic mode, second symbolic mode (ideological models), and the third enactive mode (shaping music) of representation within 3 compositional stages (n=555; the lines between the discrete observations are drawn only as illustrative points.)

Whilst the third enactive mode appears proportionally as the paradigmatic device for the compositional process, its function in compositional information has not yet been elaborated in terms of the compositional phases. The average of the proportional third enactive mode within each 18 compositional phase (substage) is 51.3 percent. However, the ratio of the third enactive mode compared with the combination of the other modes varies remarkably over the process. At the beginning of the process, the significance of the third enactive mode seems to be low. However, from the end of first 'ideas' stage onwards, it starts to prevail in a highly volatile way. This fluctuation of the third enactive mode bears indicative relations to the previously discussed modes of information: the iconic mode, the first and second enactive mode, and the second symbolic mode. The proportional trends of these modes on the one hand and the third enactive mode on the other hand seem to follow interdependent dynamics: whereas the former four trends roughly parallel each other, the third enactive mode more or less contrasts them all (Fig. 3). Whenever the 3rd enactive mode prevails the other modes become lesser and vice versa, when the 3rd enactive mode was not appropriate the other modes came to rescue. The moments when the 3rd enactive mode seemed not to suffice were those when the composer formed the basic concept and germinal ideas of the piece and when he stopped to ponder what had already been done in order to aspire to a new section in the piece. Interestingly, these instances mark the pivotal moments in the creative process, where something is to be invented out of more or less nothing.

< Insert Figure 4 about here >

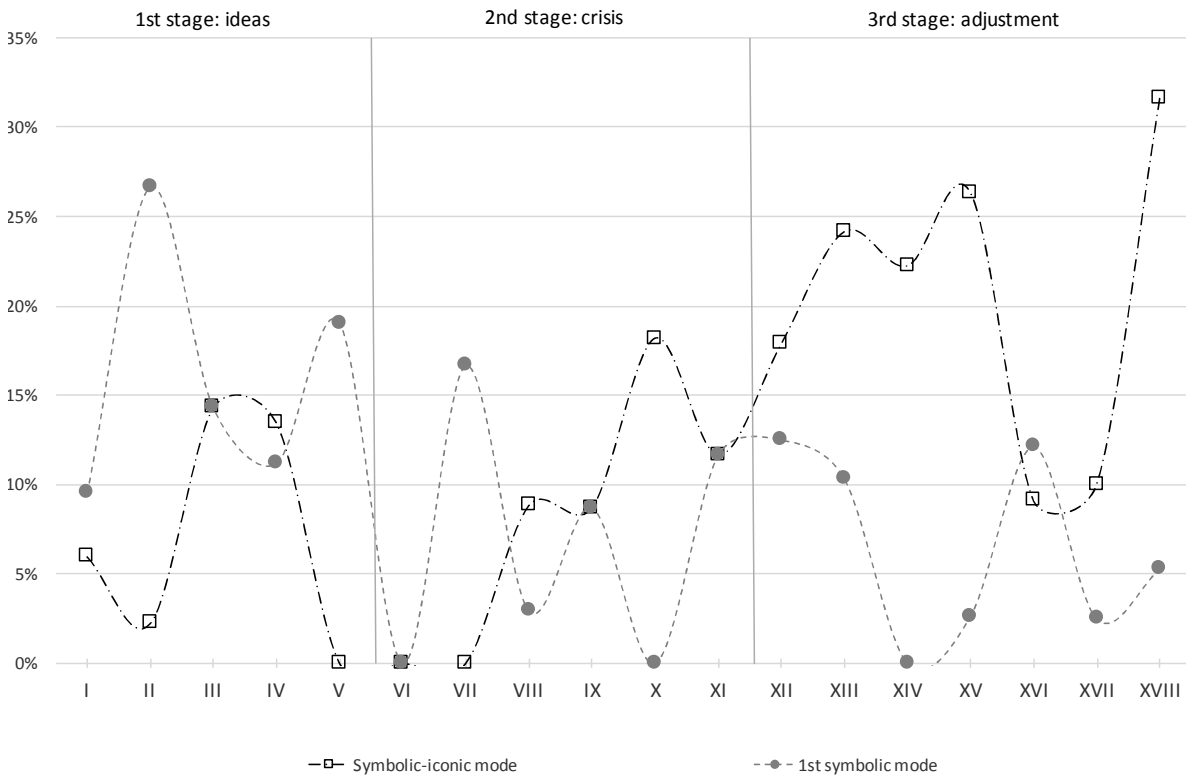


Figure 4. Proportions of symbolic-ionic mode (notating music) and first symbolic mode of representation (technological models) within 18 compositional phases (n= 112; the lines between the discrete observations are drawn only as illustrative points.)

A contrast can also be perceived between the proportional curves of the symbolic-ionic mode and the first symbolic mode (see Figure 4). Notational and theoretical questions thus seem to supersede each other: when more information about the one is needed information about the other seems less important.

Discussion

Specificity and sufficiency of the music information typology in the context of musical composition

The empirical data of the present article representing a typical compositional task and collected in the composer's studio amid of the actual creative endeavour demonstrate that the music information typology developed by Rousi, Savolainen and Vakkari (2016) is fairly specific within the context of musical composition, that is, all of its five music information modes could be identified from the composer's verbal description of his compositional process. The findings revealed, however, that the typology is not sufficient within this context as two additional modes of music-related information relevant to musical composition were identified from the empirical data: shaping music as the third mode of enactive representations and iconic representations (the iconic representations of the original typology being renamed as symbolic-ionic representations).

Based on the case study, the article at hand presents the following revised music information typology to include information types relevant to musical composition, too. Here, definitions to only additional or renamed modes are included.

- *Music making as the first mode of enactive representations*
- *Receiving music as the second mode of enactive representations*

- *Shaping music as the third mode of enactive representations* refers to composer shaping musical ideas and structures into expressive forms and organizing his compositional actions in terms of metacognitive acts of evaluating, setting musical goals, or making operative plans.
- *Iconic representations* refer to describing visual images and graphic illustrations presenting music-related information, such as landscapes, matter, pictures, sketches or drawings depicting a musical idea, passage or a whole composition.
- *Symbolic-iconic representations of music* refer to presenting musical ideas through use of modern staff notation
- *Technological models of music as the first mode of symbolic representations*
- *Ideological models of music as the second mode of symbolic representations*

While the established new iconic mode and the renamed symbolic-iconic mode represent mainly conceptual modification of the typology, the third enactive mode substantially framed the typology with new particulars specific to compositional knowledge not present in the original model. However, further studies within other genres of musical behaviour, such as Western popular music, jazz, and the vast number of different genres within non-Western musical cultures, classical or popular, may produce a more comprehensive understanding about musical information behaviour in its entirety.

Dynamics of the modes within a process of musical composition

The way music sounds must satisfy the aesthetic-ideological criteria as well as fulfil the expressive aspirations of the composer. In order to achieve this, the composer needs to know how to create music that meets these criteria, renders the idiomatic standards of musical language (in terms of musical syntax and notation) and instrumental practice, sounds right, and maybe even satisfies the listener – at least the musicians on whose reception the performances of compositions largely depend. The role of the musician and instrumental techniques in a compositional process can be read in the studies of Donin (2009; Donin and Ferón, 2012) and Roels (2014; 2016). These studies also recognize the significance of listening and visual faculties as well as noticed the music theoretical and notational aspects in the composer's knowledge.

This study was able to introduce the new information mode indicative of the artistic capacity of expressiveness: the third enactive mode (shaping musical structures) was the means whereby the composer made musical structures work for himself and hence created performative power in his music. The mode of the third enactive mode can be collated with the significant role of metaphor in music (Spitzer, 2004). Musical metaphors are often used to describe the expressivity of musical passages in music analytical discourse. The findings of this study show the way in which this expressivity in music is being created by utilizing the third enactive mode concomitantly with selected other modes of information. Especially, the way in which the composer concurred his body-based metaphors of motion and transformation with metaphoric speech regarding the physical actions of a musician on the one hand and the sounds produced by these actions (or passages notated, for their part) on the other hand. This compositional fabrication demonstrates the physical roots of human cognition, exemplified in body-based metaphors (Johnson and Larson, 2003, among others).

However, despite being the encompassing and the most common mode in this study, the third enactive mode did not establish the only scheme of creative output. The parallel modes of the first two enactive modes, iconic mode and the second symbolic mode (ideological models) can be interpreted as constituting the perceptual-ideological, or the aesthetic frame of compositional information that occasionally replaced the third enactive mode.³ Paradoxically, the critical moments where the composer preferred the third enactive mode to the aesthetic frame of information were the moments of his most significant creative initiations: undertaking a new work, deploying novel materials, embarking on new sections or addressing structural issues. Thus, a significant, though lesser part of compositional creativity seems to be 'non-compositional', even extra-musical. The aesthetic frame of compositional work can be seen as the *momentous* creative device whereas the third enactive mode of information may be seen in the light of *everyday practice* in compositional endeavour.

The roles of the symbolic-iconic mode (notation) and the first symbolic mode (technological models, i.e.

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3 music theory and analysis) with their contrasting trends, are complementary in the information architecture
4 of the compositional process in this study. The informant is an academically trained and analytically
5 disposed composer within a highly notation and music theory -oriented culture. Overall, in practice,
6 notational expertise surely includes theoretical understanding and vice versa, music analysis usually builds
7 upon a notated score, as stated by Lupton and Bruce (2011) model of the core academic substance areas in
8 the education of a professional composer. These two information modes also provide a common language for
9 musicians and composers to talk about music. However, the composer of this study also analysed virtual
10 music, that is music that had not (yet) been notated and only existed in the composer's mind. The role of
11 technological information may not be restricted to only instrumental and supportive purposes. Instead,
12 technological and symbolic-iconic information may attach any other music information mode, in the same
13 way that images of sound anchor to more or less to nearly any compositional deed.

14 *Conclusion*

15
16 This study examined the modes of music information present in a professional composer's verbal description
17 of a compositional process. The current frameworks of music related information were revised to more
18 accurately reflect information entities relevant to musical composition. New knowledge regarding the nature
19 and dynamics of the music information modes within different stages of the compositional process were
20 created. The core compositional knowledge proved to be processual, perceptual (audial, visual), and
21 embodied. The study demonstrated the pivotal but partly inadequate role of the third enactive mode (shaping
22 music) of music information. While being the crucial information mode and the driving force in generating
23 the performative power in the musical structures, the facilitation of the aesthetic frame of information (first
24 and second enactive modes, iconic mode, second symbolic mode) was required to create the germinal ideas
25 and to design the formal structure of the piece. Moreover, in order to fix the compositional ideas and
26 structures into a permanent record prolific notational work (symbolic-iconic mode) was needed. The ability
27 to shape sounds into appropriate and meaningful musical structures charged with performative power that are
28 fixed into a score indicative of a musical performance is the core know-how of a composer. It is learnt by
29 doing, by practising the enaction of composing. Further studies are needed to both validate relevant
30 information entities for various knowledge-intensive musical processes within different genres and to further
31 understand the information behavior of professional composers in general.
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3 Appendix 1: 18 phases of the compositional process (Pohjannoro, 2008; 2014; 2016))

4 *1. Creation and exploration of the germinal ideas. Dec 5–27, 2004.*

5 *Sketches 1–3; Material matrices A and B; Score versions nr. 1–3.*

6
7 I. Creating and consolidating the germinal ideas, outlining the musical form of the piece and the first
8 movement, creating the basic materials

9 II. Systematic creation, elaboration and investigation of the material T.

10 III. Detailed scheme of the first movement's form structure.

11 IV. Rudimentary inscribing of first movement's passages T₁ and S₁.

12 V. Issue of procedure in the contrapuntal material of T₁ and T₂ in the first movement; working on S₂.

13
14 *2. Evolution to crisis. Dec 27, 2004–Jan 6, 2005.*

15 *Sketches nr. 1, 3–5, and 6 A–C; Material matrix C; Score versions nr. 4–9.*

16
17 VI. Issues about the procedure T₁–T₂ in the first movement.

18 VII. Scrutinizing and restructuring the form structure of the whole piece.

19 VIII. Issues about the procedure S₁–S₂ and about the role of the first movement; initial consideration
20 about the fading effect between T and S in the second movement.

21 IX. Creating different options to deciding about issues emerging in the phases VI and VIII; the
22 proliferation of the issue into a question for the whole piece.

23 X. Sketching the fading effects of the second movement; first idea of the third movement.

24 XI. Crisis; solving the crisis.

25
26
27 *3. Adjustment stage. Jan 7–31, 2005.*

28 *Sketches nr. 6–9; Score versions nr. 10–15.*

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30 XII. Re-examining and elaborating the material T; the idea of the third movement.

31 XIII. The fading effects of T and S in the second movement.

32 XIV. Completing the T-passages in the first movement.

33 XV. Working out the fading effects of the second movement.

34 XVI. Starting to write the third movement.

35 XVII. T₁, T₂, second and third movements; ideas about new pieces; recalling of the creation of the
36 germinal ideas.

37 XVIII. Completing performing instructions, instrumentation, finding and fixing mistakes, etc
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43 ¹ In the formal scheme the sections and subsections of the movements are marked with hyphen and comma,
44 the fragmentation of the materials S and T (explained in the Results Section) with plus sign and the
45 transitional relations with greater-than sign, respectively.

46 ² All of the translations of the verbal data from Finnish into English have been approved by the composer-
47 informant of this study.

48 ³ This is not to designate aesthetic information in terms of its evaluative aspect only to the second enactive
49 and second symbolic modes. Aesthetic value is an important component of the iconic mode and the third
50 enactive mode as well.
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