AN ANALYSIS OF INTERVIEWS WITH COMPOSERS FROM A COGNITIVE
STYLES PERSPECTIVE

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ABSTRACT
This paper reports a study of relationships between composers’ cognitive styles and efficacy of the software they use. Qualitative data collected through interviews with established composers is analysed. Thus, we have elaborated a model of composition style, motivation and processes, and characterised selected composers in terms of how their cognitive styles explain their particular compositional approaches.

1. INTRODUCTION
This paper presents results of research into cognitive styles (CS) as a source of tensions between composers and the software they use. Qualitative methodology has been applied to analyse interviews with composers. Results corroborate to some extent findings of a preliminary study [1] and have allowed us to induce a richer model of issues relating to computer-supported composition.

2. RELATED WORK
CS are tendencies to adopt a particular type of information processing strategy [4,5,8,9]. We focus on four CS dimensions: global/analytic, imager/verbaliser, intuitive/sensing, and active/reflector. Analytic individuals tend to go about tasks step-by-step in a logical, relatively linear and sequential way. Consequently, they are less concerned to grasp the “big picture” early on. Conversely, global individuals tend to seek and take in information in a less sequential way, often sampling widely from the information space, and being concerned to establish a conceptual overview relatively early on. Imagers are good at working with diagrams, pictures, etc., and tend to think visually, compared to verbalisers who tend to think more in words. Relatively intuitive individuals tend to be more innovative than sensing individuals, and like to explore possibilities. Sensing individuals prefer more factual “real world” information, and like to make use of well established methods and approaches. Active individuals tend to be quick at trying things out, as opposed to the more reflective, who prefer to think things through before acting. Reflective individuals often prefer to work alone, whereas more active individuals often tend to like working collaboratively.

CS emerged as a possible factor in the design of composition software when analysis of data from Upton’s qualitative study of approaches to composition [10] identified that interviews with two experienced composers revealed traits that appeared to characterize stereotypical global and analytic CS [11]. This motivated a study [1] in which we conducted a web-questionnaire survey of composers’ approaches to composition and attitude to the software they use, and also tested their CS [2]. Results revealed correlations which were too strong to be dismissed as arbitrary phenomena. Specifically there was a dominant global/intuitive CS trait in the sample of electroacoustic composers, which was reflected in their composition approaches. Globalists tended to plan their composition whereas analytics took a more improvisatory “voyage of discovery” approach. Also, more surprisingly, satisfaction or dissatisfaction with composition software appeared to be determined by the imager/verbaliser CS trait, verbalisers being largely content and the imagists largely discontent. However, there was no straightforward interpretation of the latter correlation, since causes of discontent ranged over many issues. Thus, the study broadly supported the hypothesis that CS is an important factor when evaluating efficacy of composition software, but was inconclusive given the small sample size, and failed to provide explanation for the tentative results because of the limited richness of the data. This motivated the present study, in which we have addressed the latter limitation by collecting richer data.

3. THE PRESENT STUDY
In common with the motivating study, our research addresses the research questions: (1) Do composers display CS which conform to known classifications? (2) If so, what are the implications with respect to software environments for composition? (3) In particular, can knowledge of a composer’s CS be used to create software interfaces which are better suited to their cognitive processes and hence provide more fertile environments for creativity in music? In addition a specific aim was to seek
to corroborate or refute the previous study’s results, and seek richer explanation of phenomena that emerged.

Data was collected through interviews, lasting 12 to 45 minutes. Each covered two aspects: (i) closed questions elicited profiles of the composers; and (ii) semi-structured questions elicited approaches to, and views on, composition and related software. Composers were asked: to classify their compositional style; favoured composition processes; the composition approach taken for a hypothetical or actual 10 minute electroacoustic piece.; and to critique current composition software, particularly ones they use. Audio recordings were made of all but one of the interviews. Extensive notes were taken during the unrecorded one. Also, composers’ CSs were determined, using a test developed by Felder and Soloman, designed to measure Felder and Silverman’s four-dimensional learning styles model [3].

3.1. The Sample

Using purposive sampling [6], 12 established composers were selected and interviewed (7 based at the De Montfort University,UK and 5 based in the USA). All made extensive use of computer-generated or processed timbre in their compositions.

3.2. Methods

The recorded interviews were analysed using qualitative methodology. To avoid bias, analyses were conducted independently by each author prior to viewing results of the CS tests. Using an inductive approach, issues that emerged were coded and aggregated to form a tentative model of the composition process, which was then elaborated through theoretical sampling of the data until each author felt analytical saturation had been reached. The models were then reconciled and aggregated. The model was next compared with results of the CS tests to establish the extent to which the cognitive approaches can potentially be explained by the composers’ CS.

3.3. Results

Style: Unsurprisingly within an experimental art form, composition style was not a straightforward mapping into an established taxonomy of genre and form. Instead it was talked about in terms of largely orthogonal dimensions. These included the target audience. For example, distinction was made between academic and “popular” music. The mix of media deployed was a factor, ranging through pure acousmatic music, computer and instrumental music, music with dance, to multimedia compositions and installations. Also, composers distinguished between formal (planned) and improvised styles.

Styles also were characterized in terms of the audio materials used. Distinction between abstract (synthetic) and natural sounds was important because of implications regarding intrinsic and extrinsic musical semantics. Processed natural sound was thought to establish the latter by generating real world resonances. This aspect also related closely to sources of inspiration and motivation. These ranged widely from abstract (academic) genre-specific ideas through to human cultural, behavioural and philosophical inspirations and invocations of the natural world. Thus “style” was individually defined from composition issues and artifacts which had a personal resonance with the composer.

There was a divergence between those who treated the computer as analogous to a conventional musical instrument and those who valued it for its unpredictability. The former focused on achieving control to produce the desired audio output, whereas the later were inspired by the unpredictability of the output. Finally, there were divisions between those who work with high-level packages and add-ons, and those who work with programming languages, at the signal processing level.

Processes: The usual range of processes was used, i.e., granulation, time/frequency filtering, etc. However, a range of approaches to their application emerged. Processes were used experimentally, exploring their audio potential, or with a product-oriented focus. The latter was particularly prominent for those who create commissioned composition.

Approach: Interviews reinforced and elaborated the bipolar model derived in the previous study [11], whereby the composition is planned and then realized or the composition emerges from the detail, i.e., more a “voyage of discovery”. The other divide that emerged was between those who primarily worked in collaboration with others and those who worked alone, which in turn correlates with acousmatic and multimedia composition styles.

3.4. Scenarios

The following scenarios were selected to illustrate dimensions of the above multi-dimensional model and resonances between the composers’ self-characterisations and their CS traits. Also, they reflect the dominant CS tendencies apparent across the sample. In the earlier study the dominant CS traits were global/intuitive. In this study the 11 composers who completed the CS test also showed a dominance of these tendencies and additionally, the interviewees were mainly imagers/reflectors. Of those 11 composers, 10 exhibited at least 3 out of these 4 dominant tendencies. All eight dimensions were exhibited by at least one person, though only two demonstrated sensing tendencies and both weakly.

Composer V exhibited strong active/imaging tendencies and was one of two weakly sensing individuals; she was also a global individual, rather than analytic. She describes her style as “eclectic” and tends to work from fragments from a variety of sources, looking for or creating relationships between them. Her work usually involves live
musicians with live audio processing on them, always with an acoustic element. She describes it as “not purely electroacoustic”.

When writing a short composition she would assemble many ideas and “play with them and discover things”. She does not start with a structure but disciplines herself to create a structure later: “I have fun first”. She works with live musicians and ultimately wants to notate for performers. For tape pieces however, she would start with a field recording, because in her words: “I always want something alive in there”. She mainly uses filtering, delays and works with feedback. She describes her work as not purely digital but more “sound art”.

She struggles with software and believes that all of it hinders the composition process in some respect. She would like the software to enable her to “see her music” as well as hear it but says that most software only allows one or the other. As a result she uses multiple packages, but would prefer to use fewer, saying that she would be happy if she could even get it down to two. She did observe that if she were to spend time getting properly familiar with some modern software such as Max (which she uses, but not to its full capacity), she could probably do more of what she would like to do with it. She mainly uses Max MSP, followed by Finale and Logic. She has been using Finale for a long time but does not really like it, neither does she like Logic. One problem is that she cannot fully realise her music in Max for performing musicians. The impression is that she has a lot of definite ideas and struggles to put them into practise with the software she uses. Difficulties come from the need to use multiple software packages to handle different elements of the work and the steep learning curve to become proficient in the full use of some of the software.

Her active CS trait is illustrated when she discusses her approach to composition, i.e. assembling ideas and “playing” with them. Active individuals also tend to like working collaboratively, as does V. She is discontent with the software, as were most imagers in the previous study. She also shows analytic tendencies (very slight) which is observed in practise when she says that she prefers not to have an overall plan when starting a piece of work. This is again consistent with the previous study, where analytics tended to prefer a „voyage of discovery” approach. However, she also deploys meta-cognitive strategy, by imposing self-discipline to devise a structure later. Interestingly, she thought of herself as being more verbal and was surprised when she fell on the imaging side.

Composer W showed strong reflector/imager tendencies. He also showed quite a strong analytic/intuitive tendency, in contrast with our previous study, where the dominant CS were global/intuitive.

W considers himself stylistically “heterogeneous”. His music usually involves digital video and computer music. W does his own programming and also uses software tools. He likes to work with sounds that he finds, using a variety of techniques and ideas. He describes his approach as exploratory and “experimental”. This fits with the analytic tendency, as was also observed in our previous study. However, he also uses a plan, which the previous study suggests is a more global approach. He said he would make use of a detailed time plan when starting developing a short composition and believes that planning enables the mind to engage with the work.

W uses “programming as an integral part of composing”; he “creates algorithms, puts them together, listens to them, changes them, listens again…”. His analogy is of a sculptor, finding a piece of driftwood which he uses as a starting point for a piece; however W generates his own “driftwood” and changes the “sea and sand” if he does not like the result. He likes the idea of “emergent behaviour”.

W mainly uses C and LISP, believing that there is ultimate flexibility in C. However, he also comments on the time it takes to write it. He is proficient with most software available, describing himself as a “competency junky”. He uses lots of software and likes elements of each, but commented on the issues of versions and also that commercial tools have assumptions built into them. He has an awareness of the “channelling” caused by the software and believes that technical ideas drive in the same way as aesthetic ideas, but thinks this is not necessarily bad.

Composer X showed strong global/intuitive tendencies, which was typical of the sample in our previous study. She considers herself an academic composer, holding a doctorate in composition. She describes her style as “interactive” and “experimental”. X uses multimedia extensively. Having studied cello and piano she likes being able to control timbre with computers and uses many techniques which she refers to as “a box of tools”, to this end. She currently prefers to use just one technique per piece. For example, one 15 minute piece uses just flange and she describes the flanging as being “very worked out”.

She works with multimedia and enjoys collaboration with others. She thinks it easier to collaborate as a “digital artist”. Sometimes she plans, but sometimes she lets the music “just evolve”. This is slightly different to the previous study where most globalisers tended to plan and the analytics tended to let the music emerge which suggests that the planning versus the journey of discovery divide is more complex than previously identified.

She likes using Max MSP but uses many other software tools, because “they all do different things”. She hates to feel that software influences what she is doing, but thinks that it does, commenting that she believes it to be less influencing if you use lots of packages. She is competent with the use of the software and feels that the limited power of the computer is the biggest hindrance to her creativity as a composer.

The above scenarios are illustrative, rather than exhaustive, of the richer picture provided by our analysis. In particular, they provide instances that reinforce the
impression from the previous study: that CS is a factor when considering efficacy of composition software but also demonstrate that the relationship between CS and composition is complex, warranting further study.

4. IMPLICATIONS FOR COMPOSITION SOFTWARE DEVELOPERS

Observations can be made from our analysis, while accepting that the study is neither sufficient as a basis from which to generalise, nor is it intended to be so. These include:

Programmers seem also to be mainly reflectors. This is unsurprising, since programming is consistent with this trait, which characterises individuals who prefer to work alone and think things through more before acting.

Programmers and the more experienced are more likely to feel comfortable with the software they use, and are likely also to feel that it does not inhibit their creativity. Unsurprisingly, the converse is also true. Those who were “uncomfortable” mainly felt that software hinders their work.

Composers tend to combine planning and “voyage of discovery approaches, but one of these is often dominant. The difference seems to be at what point they draw up a plan. Some start with a plan whereas others start bottom up and only start planning later.

Meta-cognition may also be a factor. All subjects were experienced and demonstrated maturity and self-awareness. Consequently, they seem to have developed meta-cognitive strategies to impose a level of organisation on activities, to compensating for inherent less organised traits.

Returning to the research questions, we have rationalised self-characterisations offered by the composers as being consistent with CS traits, and consequently software needs to accommodate different CS to overcome frustrations and give composers flexibility to achieve what they want to do. Therefore, knowledge of patterns amongst composers with respect to CS could be useful in the development of new composition software.

This study was intended to investigate what Olaisen [7] has termed sensitising concepts which “offer a general sense of what is relevant and will allow us to approach flexibility in a shifting, empirical world to „feel out“ and „pick one’s way“ in an unknown terrain”. As such, it provides at least a prima facie case for further systematic research to investigate the incidence and effects of CS amongst musicians. This could be based on a large representative sample, using quantitative measures of constructs and relationships tentatively identified here in order to establish their generalisability. Also, it provides a basis for the experimental design and testing of composition software interfaces. Certain of the CS identified and linked to aspects of composition practice – in particular the holistic/sequential dimension – could be relatively directly operationalised in software interfaces.

There is evidence from studies of other aspects of cognition that matching CS with information access and presentation in certain conditions can have significant effects on the efficiency and effectiveness of information processing (e.g. [8]). It would be relatively easy empirically to test the effects of different CS-based interfaces on, for example, composers’ perceptions of the utility and effectiveness of the software.

5. REFERENCES