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Quantifying MIDI Use for Instrumental Composers
by **Max Giteck Duykers**

1. Introduction and Rationale

The computer tools that we use for the composition of instrumental and vocal music (MIDI samples, MIDI instruments, and computers and music software) present various choices that can guide us to make choices that we don't realize we are making (Lanier, 2010). Of course they also offer many advantages over the traditional pencil and paper method of composing, but there has traditionally been a widespread fear and distrust of their use for composing (Watson, 2006; Kayali, 2009; Oteri, 2002; Airy & Parr, 2001).

I use computer tools in my compositional process and have since they were available since the mid 1980's. I believe they have greatly helped my compositional development, but they also have many shortcomings and drawbacks, and I have struggled with feeling "boxed in" by the tools. I have developed procedures to reap their rewards and reduce their negative effects, or to "cross-check" the choices I may have made unconsciously with the tools. I believe that young composers will increasingly use these tools, and as a music educator I have a responsibility to understand and teach their

effective use. Indeed, as many people have noted, they can be quite useful in the institutional setting (Airy & Parr, 2001; Criswell, 2010; Demski, 2010; Kersten, 2004; Muro, 1991), and so I believe that concrete data about these tools could be very useful for music educators.

2. Literature Review and Socio-Historical Perspective

There is almost no existing research and statistical analysis on the use of computer tools by instrumental and vocal music composers, with the important exception of Watson's PhD dissertation from Victoria University of Wellington in New Zealand (2006). Watson's project, titled "The Effects of Music Notation Software on Compositional Practices and Outcomes" consists of a survey of 106 New Zealand composers, discussion of results, and, as Watson also faced the dearth of relevant preexisting literature, an extensive comparative study on the concurrent development and adoption

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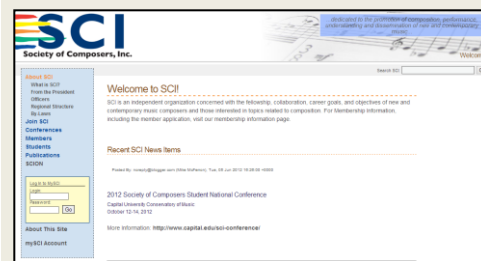newsletter@societyofcomposers.org

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of word processing and its implications on writing. In addition, the author also discusses his own compositional practices, and provides a DVD with video footage of himself composing as evidence. Finally, he includes an in-depth interview he conducted with Michael Avery, content editor for Sibelius music software.

Watson's survey is nine pages and contains many open-ended questions, in addition to several multiple-choice questions. His interests are in the adoption, use, and attitudes on the use of music notation software (MNS), and he spends less time discussing issues around playback (although he does investigate the use of plug-ins to expand on the playback capabilities of MNS). He concludes that the typical New Zealand composer is a 40-year old male with 22 years of composing with good practical knowledge of computers. He uses Sibelius in conjunction with piano and paper, and the mix of the three varies with each piece. MNS is a scoring and creative tool, although this average composer does not feel that the tool is a collaborative one and can be misleading with respect to playback and playability by live musicians.

Kayali has also published a paper on USC's *Resonance* online music journal titled "Music Notation Software: a Composer's Best Enemy?" His findings are based largely on Watson's dissertation, but also on a collection of articles written by six leading composers published on the New Music Box webpage in 2002 (more below). Kayali also interviewed music students and teachers at USC for his study. Kayali suggests that composers born after 1975 are more likely to use MEPS (music engraving and playback software) as a compositional tool, whereas the older generation is more likely to use this tool as merely for scoring. He presents the potential pitfalls of using MEPS as a compositional tool such as excessive cut-and-paste and the misleading nature and limited timbral capabilities of the playback tools (even with the availability of expensive sample collections). Kayali suggests a mentality where MEPS can be used effectively without detriment to the process of composition: awareness of the pitfalls, questioning the choices the software makes automatically, and monitoring the decision making process to under-

stand possible compromises and to "fight" the tools to re-navigate towards one's original creative goals. Finally, mixing the use of MEPS with other processes, like sketching on paper and thinking about the music in the "inner ear" is critical to using the tools effectively as a means to self-awareness.

In addition, this topic has been the center of discussion on the American Music Center's New Music Box Webpage (**http://newmusicbox.com/article.nmbx?id=1810**), and on the online blog "My Ears Are Open" (**http://myearsareopen.net/**). The Society of Composers, Inc. membership also continuously carries on an email dialogue through its moderated email discussion forum, and I have read several that discuss these and related topics. While very informative and provocative, most of this dialogue comes with heavy opinion and with little description or statistical analysis of who is actually using computer tools and how they feel about them.

The Watson and Kayali studies are also largely qualitative, with write-in questions and anecdotes informing the majority of the results, and so I believe there is a need for more concrete data on this subject. Furthermore, these studies focus mainly on music notation software, which is only one component to the variety of computer tools available. My study adopts a wider definition of computer tools to include, most importantly, ones which play music back and which are intended to create a model or representation of acoustic music. This is the area that I believe the tools can have their most significant impact: positive and negative, and it therefore deserves careful investigation to help transcend the anecdotal nature the discussion about these tools has taken.

3. Research Questions

1. Who is using computer tools in composition, and what are the prevailing attitudes about their use in composition?

2. How are the attitudes and wisdom about computer tools correlated to the composers' creative processes with them?

3. What are the attitudes among music educators about the use of computer tools for teaching composition?

Expanding on Watson and Kayali, and taking into consideration the additional anecdotal accounts I have uncovered in my research, I imagine for question 1 that the primary group of computer tools users will be in their late 30's with about 15-20 years of composition experience. They will be advanced computer users, and will have mixed feelings about the use of computer tools in their creative processes, taking special caution about their pitfalls. For question 2, I imagine that there will be a large number of users who use computer tools in conjunction with acoustic and pencil-and-paper methods of composing. These users will be the most cautious of the computer tools' shortcomings, and yet reap the greatest rewards from them. For question 3, I imagine that music educators teach computer tools to their students but have mixed feelings about them. Their prevailing, attitude, however, will be that the tools are useful and necessary.

4. Methodology

4.1 Participants

A large emailing list of mostly music educators and professional composers was invited via email to participate in a web-survey three times between June 14th 2009 and February 1st, 2010. In addition, about 100 undergraduate and graduate music composition students were invited. Approximately 1500 people received an invitation to participate in this survey. 196 people participated, which is 13% participation.

4.2 Materials

I created a web survey of 50 questions to attempt to determine who is using computer tools in their compositional process, how they use them, how they may have affected their music creation, what their attitudes are about their use, and how they imagine these tools might be effectively taught to young music students. Many questions attempted to gather both qualitative and quantitative data about the same questions, as both are useful for different discussions.

4.3 Procedure

This survey was placed on a "Survey Monkey" webpage, which participants could visit at their convenience. Participation was anonymous, and participants could exit the survey at any time.

5. Results and Analysis

I coded my answers in Survey Monkey, giving each a numerical value. Then I imported the data into Microsoft Excel for formatting, to further code some ambiguous "Other" answers, and to strip out invalid data. From there I imported the data into S.P.S.S. (Statistical Package for the Social Sciences—IBM software designed for statistical analysis). In SPSS it is possible to filter the data (for select cases based on one or many of the variables) and then create various charts, tables, and descriptive statistics.

In my analysis I attempted to understand the following about my participants, pursuant to these three research questions:

1. Who is using computer tools in composition, and what are the prevailing attitudes about their use in composition?
   a. Who is using computer tools? i.e., age; medium, composition of live vs. electronic music; how long as a composer; types of computer tools
   b. Overall attitudes about their use, the development of these attitudes, the advantages, and the expectations for the future of the tools
   c. For the composers who listen to MIDI samples to simulate live instruments or vocals, what is their experience with these samples?
2. How are the attitudes and wisdom about computer tools correlated to the composers' creative processes with them?
   a. What are the steps of the participants' compositional process? How and when do computer tools enter the process?
   b. How are a composer's attitudes about the use of computer tools correlated with his or her process with computer tools?
3. What are the attitudes among music educators about the use of computer tools for teaching composition?
   a. Do composers feel that the use of computer tools is correlated to their skills or deficiencies

in the field of musicianship?

b. How do music educators engage with the tools around their instruction, and what are the attitudes about their use by students?

The largest group of respondents are aged 26-35 (34%), are moderate or advanced users of computers (37% and 61% respectively), and have 6-15 years of experience as composers (42%). 99% of them compose music which is strictly instrumental, and 60% compose music which is electro-acoustic. The majority's (53%) musical output is 90% or more live vs. electronic.

The most important type of software (64%) for the respondents is notation software. 56% of respondents feel that despite their shortcomings, computer tools are useful, an attitude which was mostly (96%) developed from personal experience with the tools, rather than the opinions of others.

The most important advantages of computer tools for all respondents are the ability to hear the whole shape of the piece in real time (33%) and the ability to make nice looking, editable scores (36%). About the future of computer tools, 81% feel the tools will be increasingly used by young composers, and 71% feel their simulation of real music will improve.

85% of participants use MIDI samples or synthesized sounds to simulate live sounds during their compositional process and the sounds they mostly use (64%) are those bundled with their software. Of these users, the majority (53%) feel that with an understanding of the MIDI sounds' shortcomings, they can be useful.

64% of participants "bounce" back and forth between auditioning their ideas on acoustic instruments and computer tools during the compositional process. Of these 56% feel that MIDI samples and sounds are useful despite shortcomings, compared with 50% of those who work in their head or at an instrument who say that MIDI sounds are misleading. 56% of composers who work directly into the computer agree with the "bouncers" on this issue.

For the "bouncers," MIDI's worst representations are timbre (29%), the balance between instruments (36%) and articulation (16%), compared with 64% timbre for those who compose at an instrument and 40% balance between instruments for those who compose at the computer. All users agree that intonation and meter are well represented by computer tools (38% each).

56% of respondents feel that the use of computer tools has helped them overcome inadequacies in their musicianship, the primary one being performance or piano skills (32%).

68% of the participants are music educators, and 89% of these educators have students who use computer tools to realize their musical goals. 66% of music educators teach the use of computer tools to their students, whose projects are 66% instrumental music. 89% of music educators feel that despite their shortcomings, computer tools can be useful, and only .8% feel that they do not want to know about the use of computer tools by their students. Further, 48% of music educators feel that there is a proper way to use the tools and in improper way, and 54% feel that knowledge of the tools is important for securing employment.

6. Discussion

I found that, consistent with my hypotheses, the respondents were younger, tech savvy, with many years of experience with composing and with using computer tools throughout their compositional process. I was surprised, however, to find that a very large majority of these composers listen to their playback throughout their compositional process, and that they listen primarily to the sounds that come bundled with their software rather than any kind of professional-quality samples which more accurately represent acoustic sounds. As the primary focus of this group of respondents is instrumental and vocal music rather than music which is composed for electronic sounds, I wondered how these participants felt about the samples they were listening to, specifically how they reconcile the differences between these sounds and the acoustic ones they are meant to represent. The most illuminating answers came in the "Other" answer where participants could write in their comments. Here I saw, consistent with my hypotheses, that there was a widespread acknowledgement of the weaknesses of computer tools, but an embracing of their strengths. The overriding

sentiment about sounds in playback is that they are merely a "mock-up", and that the composers were able to maintain an actual sense of the real acoustic sounds in their head while listening to less-than-realistic samples playing back their music. This wisdom comes from experience, the composers say.

This wisdom was apparent in their write-in answers about the most successful processes to adopt in composition: they have found what works for them, and so I was very encouraged to find that a majority of participants "bounce" between computer tools and traditional, "pencil and paper at the piano" methods of composing, rather than relying only the computer for auditioning (a dead-end I have taken and have seen my students take). I have found this to be the most effective use of these tools as well. I was surprised to find that age, years of experience as a composer, and medium of composition (electronic vs. instrumental) bear no significant impact on participants' choice of auditioning process (listening to the computer only, listening to an acoustic instrument only, listening in one's head only, or "bouncing" between these three). We can therefore infer that those who have embraced the tools' strengths and weaknesses have the most success with them by adopting a personalized hybrid approach to their use.

Computer tools also were very prevalent in education, and I was encouraged to see that music educators are using the tools and appear to have adopted the same wisdom that the larger group has about their effectiveness and pitfalls. These educators have students who are increasingly using these tools, and this is consistent with my research and personal experience. This, in my opinion, supports the idea that the use of computer tools in music education should be carefully examined and monitored, as music educators have a responsibility to teach their effective use, just as they have a responsibility to teach the proper ways to orchestrate for different instruments or to prepare a professional-looking score. Computer tools are not going away (this opinion is supported by nearly all of my music educators participants), and so it is time to address this issue with as much competence as we approach any other issue which directly affects the success of our students.

7. Conclusion

The definition of musicianship is changing drastically and very quickly, as composers use computer tools extensively throughout their composition processes. The power the computer tools have is now a potent force to be reckoned with, as they can guide and assist composers in invaluable ways, and also greatly mislead. Music educators may be faced with a young generation of inexperienced composers who rely heavily on the tools and whose aural conception of acoustic instruments is forming while they are also listening to MIDI mock-ups. These educators may find they have the most success by teaching students to "bounce" between the tools and acoustic auditioning methods, a process which should focus on mastering the inner ear's reconciliation between live instruments and their MIDI representations.

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Performances, Awards, Commissions, Honors, Publications and other Member Activities.

James Crowley

The guitar/bass duo Dez Cordas commissioned James Crowley's recent work *Pilgrimage* and are performing the work on a fall 2014 tour including concerts in South Carolina, Pennsylvania, Illinois and Wisconsin. His chamber ensemble work *Circle in the Round* was presented in March 2014 at the Westfield Festival of New Music by the Boston New Music Initiative, and his guitar/saxophone duo *Tableaux Vivants* is slated for upcoming concerts by Duo Montagnard in Arizona, Connecticut, and on a 2014/15 tour of Belgium and France. Last spring, his wind ensemble work *Tombeau* was presented on the campuses of Concordia University Wisconsin and the University of Wisconsin-Parkside.

James Crowley

Adrienne Albert

Cuban Stories for flute, bass clarinet, viola and piano was premiered May 6, 2014 by Chamber Music Palisades in Los Angeles.

Brandon Goff

In Landau, Germany Brandon Goff as a guest composer and lecturer presented a concert this on June 15, 2014 with the premiere of *And the Music Stopped*.

Bill Vollinger

It Takes a Long Time to Grow Up in NJ was premiered by the Ridgewood Concert Band directed by Dr. Chris Wiljhelm for their final concert of the season, entitled "Celebrate New Jersey" on May 9, 2014 at Westside Presbyterian Church. *An Empty Swing* and the premiere of *I-IV-V-I* were presented by the Hamilton-Fairfield Symphony Orchestra conducted by Paul John Stanbery in southwest Ohio on June 22, 26 and 28.

Wallace De Pue, Sr.

Opera Composer's International Competition sponsored by the Boston Metro Opera named *Dr. Jekyll and Mr. Hyde* as an honorable mention and awarded *Something Special* with the gold medal. Recipients of the gold medal receive a featured performance as part of Boston Metro Opera's regular season and become part of Boston Metro's standard repertory.