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Data Services and the Performing Arts

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Introduction

In the academic world, research is primarily seen through the scientific approach of collecting and interpreting scientific or numeric data, or the humanistic approach of comparing and interpreting texts. However, faculty and scholars at many academic research institutions include performing artists and other non-traditional scholars. How does the research generated by performing artists fit within the academic research community? Do performing artists have similar data needs as researchers in other disciplines? A standard scholarly research lifecycle in the sciences or humanities starts with data collection and research in the library or lab, and continues through a written document that is published, disseminated, archived, and preserved. Do the performing arts follow a similar cycle? Performers select a work to perform, study the work, and perform it. Along the way they are informed by previous performances (if applicable), and the final product is a performance of the work, which can be recorded, archived, preserved, and disseminated. An artist practicing and learning a work to perform is similar to a scientist collecting information in the lab or library, or a humanist examining texts. The final product of the performer's research is a new performance of the same work, which is similar to new research informed by previous research in other disciplines. Live performances are recorded, and recordings are published, archived, and preserved, as are scholarly articles in the sciences and humanities. Although these tasks seem similar to traditional research, the performing artist sees each step in a different light than the traditional scholar. For example, although a recording captures a live performance, a recording has different properties from a live performance, and is not considered the final product of the research. The live performance is the final product, but cannot be archived and preserved in the same way as traditional research. Ultimately, data in

the performing arts is different from data in the sciences and humanities, but the process of collecting, preserving, and disseminating this data is similar.

This paper will examine the lifecycle of performing arts research, and compare and contrast this lifecycle with traditional research methods in academia. Knowledge of this non-traditional scholarship and research will inform data curation practices within the library. With this understanding, librarians will gain clearer insight into how to support the performing arts research cycle, including what to collect and preserve, and how to provide access to these resources.

Scholarly Research Methods in the Sciences

Scholarship and research methods differ among disciplines. Each discipline has its own research methods, and some methods are used across disciplines. In the sciences and social sciences, the two overarching research methods are qualitative and quantitative. Each method has many measuring tools and assessments, which are always evolving. In general, qualitative research is associated with social science, and quantitative research is associated with science research, though the boundaries between these two major disciplines are often blurred. That said, a broad overview of science and social science research methods and data is necessary for us to provide a reasonable parallel to humanities and performing arts research.

Quantitative Research

The scientific method has been used for hundreds of years. Van Peer, Hakemulder, and Zyngier explain, “[s]cientific [method] can be defined here as a kind of reasoning and a kind of research that is based on real evidence, that is on evidence from the real world, which can be inspected by anyone independently from one’s own conviction.”¹ This method can be used in science and social science, but only for quantitative research because “real” evidence usually

¹ Willie van Peer, Jèmeljan Hakemulder and Sonia Zyngier. *Scientific Methods for the Humanities*. (Amsterdam: John Benjamins Pub. Co., 2012), 7.

means something measured with precise instruments that result in numbers. Thus, the quantitative method basically means the researcher is “counting” or enumerating in one form or another, though this can be quite complex. Researchers using quantitative research have a variety of methods to analyze data, which include statistical analysis, regression, structural equation modeling, and game theory, among others. Ideally, these methods are used because the data and analysis is objective, rigorous, verifiable and neutral. Most importantly, the quantitative research should be replicable, so another researcher who uses the same method should arrive at the same conclusion or, at the very least, collect the same raw data set for analysis.

Quantitative research starts with the collection of data, which are put in datasets. The dataset is numerical and is usually stored in a database, which allows researchers to apply various analytical tools. Most researchers will use techniques and software that do not alter the raw dataset. For example, researchers run computer scripts using SPSS (statistical software) to extract specific data and place this extracted data into a new file for analysis, which is separate from the raw dataset. This separation allows the raw data to remain unaltered and allows the researcher to run many queries and re-test queries for verification without making changes to the raw data.

Borgman mentions that since most scientific data today are “born digital” they are “difficult to separate from the software, equipment, documentation, and knowledge required to use.”² This issue raises many challenges for researchers, including learning these research methods,³ and the long term availability of data,⁴ which are issues not discussed in this article.

² Christine L. Borgman. *Scholarship in the Digital Age: Information, Infrastructure, and the Internet* (Cambridge, MA: The MIT Press, 2007), 183.

³ Jan M. Nolin, “Boundaries of Research Disciplines are Paper Constructs: Digital Web-Based Information as a Challenge to Disciplinary Research,” *First Monday* 16, no. 1 (2011): <http://dx.doi.org/10.5210/fm.v16i1.3669>.

⁴ William K. Michener, James W. Brunt, John J. Helly, Thomas B. Kirchner, and Susan G. Stafford. “Nongeospatial Metadata for the Ecological Sciences.” *Ecological Applications* 7, no. 1 (1997): 331.

Qualitative Research

Social scientists also use qualitative research, which similarly adheres to the scientific method, but its data is not precise and cannot be broken down into absolute, comprehensive conclusions. Denzin and Lincoln's generic definition of qualitative research explains that it "is a situated activity that locates the observer in the world,"⁵ but they later point out that with qualitative research "[o]bjective reality can never be captured."⁶ Borgman describes how social science research data can be placed in two large categories: "data collected by researchers through experiments purposes... and data for purposes other than research,"⁷ also known as administrative data. Methods used to collect data for research may include interviews, focus groups, surveys, and observations. The researcher is intimately involved in the entire process from the formation of the idea to collecting the data and the analysis. The dataset is created during the research. For example, a researcher interviews single parents on reading. The dataset is the interviews (e.g., recordings, transcriptions) and the researcher's notes from the interviews. The dataset is not numerical, and still provides the researcher rich data for analysis, but the analysis may be subjective.

Administrative data, on the other hand, is usually collected as a function of an institution or government. The US Census' decennial population census (United States Census Bureau) may be the most well-known collection of administrative datasets. One of the primary reasons this data is collected is to determine the number of representatives each state is allotted (along with allocated federal funds), based on the state's population. Though statistics from these datasets are chiefly applied to the management and allocation of government resources, in the social sciences such quantitative data suggest new questions. The researchers were not involved with the survey or data collection, but this quantitative data is a vast collection used by

⁵ Norman K. Denzin and Yvonna S. Lincoln. Introduction to *The Sage Handbook of Qualitative Research*, eds. by Norman K. Denzin and Yvonna S. Lincoln (Thousand Oaks, CA: Sage, 2011), 3.

⁶ Ibid, 5.

⁷ Borgman, *Scholarship in the Digital Age*, 204.

social scientists for a wide range of study and analysis of the US population.

Scholarly Research Methods in the Humanities

Although research methods in the humanities follow a similar cycle as those in the sciences, the texts of published, primary sources generally hold more significance to humanities scholars. Mink, a historian, explains his view on the scientific method by stating, “[a] major principle of logical empiricism is the so-called methodological unity of science, that is, the view that there is no formal or logical difference among the various bodies of practice and consolidated inquiry which can count as scientific.”⁸ He then contrasts the major differences between researchers using the scientific method with methods applied by historians by saying that “even though historians may use methods and organization for research, their primary purpose is to tell stories, that is, provide a narrative explanation.”⁹ This narrative explanation, and other research methods in the humanities, typically begins with a text or a work of art (e.g. object, score). The statement below from Stanford’s School of Humanities and Sciences expands Mink’s view to encompass how humanities differ from science and social science research (i.e., qualitative and quantitative research methods).

“A hallmark of humanistic study is that research is approached differently than in the natural and social sciences, where data and hard evidence are required to draw conclusions. Because the human experience cannot be adequately captured by facts and figures alone, humanities research employs methods that are historical, interpretive and analytical in nature.”¹⁰

Howe expands upon this particular nuance by stating, “[r]esearch in the humanities is not devoid

⁸ Louis O. Mink, “History and Fiction as Modes of Comprehension,” in *Historical Understanding*, eds. Brian Fay, Eugene O. Golob and Richard T. Vann (Ithaca, NY: Cornell University Press, 1987), 44.

⁹ *Ibid*, 45.

¹⁰ “How is Humanities Research Reshaping Our Future?” *The Human Experience: Inside the Humanities at Stanford University*. (Humanities: Stanford University, n.d.): para 5, <http://humanities.stanford.edu/how>.

of empirical content. Nor, for that matter, is research in empirical social science devoid of the normative content characteristic of the humanities."¹¹ How do these differences and blurring of fields and methods impact the humanities, especially now with the relatively new digital humanities?

Humanities scholars have formed the distinct sub-discipline of "digital humanities" by applying computer technology to extend traditional approaches and to assist in research. Zorich states that digital humanities "implies humanities-based research, teaching, and intellectual engagement conducted with digital technologies and resources,"¹² though there is no definitive definition.¹³

Gibbs & Cohen provide an example of digital humanities researchers taking advantage of computational tools for textual analysis research. Their research focuses on discovering changes in textual terms during the Victorian period by using Ngram (a Google product).¹⁴ They use the digital technology for the initial analysis, but they apply their humanities expertise to understand the data and draw conclusions. Initially, they explain the limitation of Ngram and then show how to use it to discover how the terms "Christianity" and "God" in book titles changed during the Victorian era. The tool helped them find questions and then they applied traditional (i.e., non-digital) methods to find possible answers. Gibbs & Cohen further state how their research and other digital humanities research are connected to foundational methods:

"Experiments such as these, inchoate as they may be, suggest how basic text mining procedures can complement existing research processes in fields such as literature and history ... Far from replacing existing intellectual foundations and

¹¹ Kenneth R. Howe, "Positivist Dogmas, Rhetoric, and the Education Science Question," *Educational Researcher* 38, no. 6 (2009): 433.

¹² Diane M. Zorich, *A Survey of Digital Humanities Centers in the United States* (Council on Library and Information Resources, Washington DC, 2008), 4.

¹³ "How Do You Define DH?" *Day of DH 2012*. Last modified April 3, 2012, <http://dayofdh2012.artsrn.ualberta.ca/dh/>.

¹⁴ Frederick W. Gibbs, and Daniel J. Cohen, "A Conversation with Data: Prospecting Victorian Words and Ideas," *Victorian Studies* 54, no. 1 (2011), 69-77.

research tactics, text mining is yet another tool for understanding the history of culture—without pretending to measure it quantitatively—and one that complements how we already sift historical evidence."¹⁵

Humanities Research in the Arts

Some disciplines within the arts use research methods similar to humanities research. Examples include musicologists, dance historians, and theatre historians. Clarke and Cook state, "[l]ike most humanities scholars, musicologists are prone to build interpretations on very small data sets or even on single instances..."¹⁶ They also explain that just because a musicologist's interpretation is largely speculative or even metaphysical, it is still often regulated by the score, which can involve empirical methods.¹⁷ The research needs of this type of scholar are similar to the humanities scholar.

Scholarly Research Methods in the Performing Arts

Performing artists follow a research cycle similar to other scholars through research, analysis, and presentation/interpretation of data. Data in this field is a work of art in written, audio, or visual form, although most performers do not label their art as data. In the past several years, the performing arts community has engaged in a discussion about practice as research. A natural extension would be to view art as data. "[Brad Haseman's] 'manifesto for performative research' argues that theoretical framework which constructs a divide between quantitative and qualitative methodologies should be revised to embrace a trivariate of approaches: the qualitative, quantitative and performative."¹⁸ Haseman describes this third methodology: "[i]t has

¹⁵ Ibid, 75.

¹⁶ Eric F. Clarke and Nicholas Cook, Introduction to *Empirical Musicology: Aims, Methods, Prospects*, ed. by Eric F. Clarke and Nicholas Cook (Oxford: Oxford University Press, 2004), 4.

¹⁷ Ibid, 5.

¹⁸ Lelia Green, "Research Outputs in the Creative and Performing Arts: Australianising an International Debate," *Media International Australia, Incorporating Culture & Policy*, no. 118 (2006), 12.

many of the values aligned with qualitative research, but is nonetheless distinct,” and “...when research findings are made as presentational forms, they deploy symbolic data in the material forms of practice; forms of still and moving images; forms of music and sound; forms of live action and digital code.”¹⁹

The general academic community considers traditional research output to be in a written format, and “publications are often considered as the formal research output.”²⁰ This definition of research output does not recognize artistic performances. However, some artists view their artistic output as a form of research in and of itself. In a recent study by Blom, Bennett, and Wright involving interviews with eight performing artists, four participants felt that “the artistic process is research involving aspects of the unexpected, intuitive, mysterious, and serendipitous.”²¹ Four other participants felt that the artistic process was “holistic, offering different viewpoints of the human being as a site of knowledge.”²² For all eight of these artist scholars, the artistic output is a result of creative research, even though the output is not in written format.

In another study, Sarah Rubidge differentiated between three types of performing arts research:

1. research which “interrogates or tests pre-formulated questions and/or hypotheses”²³ (practice-based research),
2. discovery-led research, often started without a clear hypothesis²⁴ (practice-led

¹⁹ Brad Haseman, “A Manifesto for Performative Research,” *Media International Australia Incorporating Culture & Policy*, no. 118 (2006), 102.

²⁰ Mu-hsuan Huang and Yu-wei Chang, “Characteristics of research output in social sciences and humanities: From a research evaluation perspective.” *Journal of the American Society for Information Science & Technology* 59, no. 11 (2008), 1820.

²¹ Diana Blom, Dawn Bennett and David Wright, “How Artists Working in Academia View Artistic Practice as Research: Implications for Tertiary Music Education,” *International Journal of Music Education* 29, no. 4 (2011), 362.

²² *Ibid.*, 363.

²³ Sarah Rubidge, “Artists in the Academy: Reflections on Artistic Practice as Research.” Paper presented at *Dance Rebooted: Initializing the Grid*, Deakin University, 1–4 July, 2005, 8, <http://ausdance.org.au/articles/details/artists-in-the-academy-reflections-on-artistic-practice-as-research>.

²⁴ *Ibid.*

research),

3. “research in which artistic practice is a primary, not secondary, research methodology”²⁵ (practice as research).

Of these three types of research, only the first can be undertaken by an outside observer and not the artist himself. This type of research is analogous to an ethnographic study of artistic practice and can only be undertaken objectively by researchers who are not actively engaged in the same or a similar practice. However, because this type of research is often undertaken by scholars rather than practitioners, the performers themselves may feel left out of the process and undervalued in the academic environment where their experiences are exploited, and the research based on their practice is more valued than the practice itself. There are many discussion of exploitation of performers in the scholarly literature, including many chapters in *Western Music and Its Others*.²⁶

An example of this type of performing arts research is an experiment by Shaffer, who carefully examined highly-regarded pianists and their technique.²⁷ The experiment measured the duration of key presses (amount of time each key was held down) and matched it to the reputation of the performer, based on critical reviews, to determine expressiveness. A computer captured the data points, and gathered quantitative data. The study did not take into account the emotional response of the listener. In this case, the performer was being studied, and not the performance.

In another example of practice-based research, Wyon et al. examined video recordings of classical ballet and modern dance, not as art performances, but in an attempt to determine exercise intensity of each type of dance.²⁸ In this case, the original art object was not being

²⁵ Ibid, 9.

²⁶ Georgina Born and David Hesmondhalgh. *Western Music and Its Others: Difference, Representation, and Appropriation in Music* (Berkeley, CA: University of California Press, 2000).

²⁷ L.H. Shaffer, “26 Analysing Piano Performance: A Study of Concert Pianists.” *Advances in Psychology*, 1, (1980), 443–455. [http://dx.doi.org/10.1016/S0166-4115\(08\)61961-5](http://dx.doi.org/10.1016/S0166-4115(08)61961-5).

²⁸ M.A. Wyon, E. Twitchett, M. Angioi, F. Clarke, G. Metsios, and Y. Koutedakis, “Time Motion

used as a piece of art, but rather as a dataset for the researcher's study. Studies such as these can make performers feel that their work is integral to the academic research process, but that the performance is not valued as much as the research surrounding the performance.

Practice-led research and practice as research are often grouped together and called practice research. This type of research can only be undertaken by performers/practitioners, and attempts to remove the dichotomy between practice and theory, and integrate the two into a single process. Other disciplines that are interested in practice research include medicine²⁹ and teaching.³⁰

Practice-led research can be thought of as research through practice. A simple example is a musician experimenting with the type of sound that is created by a certain movement on a stringed instrument. The result can generate a theory by the performer, and this theory is tested by similar movements and results. Other examples of this type of research involve more traditional written outputs, for example, writing about the above experiment with movement and sound. In this example, the experience of being inside the performance is crucial to the discussion.

Practice as research views arts practice as a site of knowledge, and can be thought of as incorporating performance research into practice. A common example of practice as research is the traditional teacher-led model of study in the performing arts, through lessons or masterclasses. In this example, the student is the researcher, and is researching the techniques used by the teacher. The student then incorporates these findings into their own performance. In this type of research, the process of performing itself is under scrutiny and research.

In the examples above, an art object (including a performance) is research output as

and Video Analysis of Classical Ballet and Contemporary Dance Performance," *International Journal of Sports Medicine* 32, no. 11 (2011), 851–855, doi:10.1055/s-0031-1279718.

²⁹ Gary Rolfe, "The Theory-Practice Gap in Nursing: from Research-Based Practice to Practitioner-Based Research," *Journal of Advanced Nursing* 28, no. 3 (1998), 672-679.

³⁰ Martha Stone Wiske, *Teaching for Understanding: Linking Research with Practice* (San Francisco, CA: Jossey-Bass Publishers, 1998).

well as an object for research. In the performing arts research cycle, a performance is a piece of art in its own right. However, performing artists also watch and/or listen to performances and recordings to collect information, or data, about how the piece is performed, and the performance becomes a type of dataset. Specific data collected from performances include, for example, where a performer breathes or changes bowing, and use of vibrato, phrasing, and articulation. Stage presence, delivery, and engagement with the audience are other data points that can be collected from a performance. The performance can be a different artist, live or recorded, or a recording of the performer himself used for self-study. The data gathered informs the performer's own interpretation of the same work of art. However, most performers do not consider this information to be data, even though the process is similar to data gathering in other disciplines.

Through conversations about research and performance, traditional research environments are opening their definition of scholarly work to include artistic performances. In order for academic libraries to support all types of research output, including creative works from our faculty, as well as data created by our faculty, we need to open our definitions of research and data to these types of non-traditional scholarship and datasets.

The Library's Role

Considering that performances are often used as data sets by performing artists and other scholars, what types of resources can libraries create or exploit to best support the research needs of performing artists? Should recordings be treated as datasets as well as art objects? Are manuscripts data? If so, is the workflow for curating and preserving "art as data" different from that for "art as art"? Should curation of performing arts data be seen as a new branch of data curation in the library?

Within the sciences and humanities there are increasing opportunities to develop and explore the methods and characteristics of data curation. Defined by the UK's Digital Curation

Centre (DCC) as the maintenance, preservation and value addition to digital research data throughout its lifecycle,³¹ digital or data curation has become a strategic priority among research institutions and their libraries. Multiple factors are driving this prioritization, including external motivators such as funding requirements and enhanced public access to research, to the more internally focused need to develop and document scalable, secure workflows. Both aspects are significant for the performing arts, particularly in light of ongoing efforts to integrate creative and practice oriented disciplines more fully into higher education promotion and research funding practices. Such efforts have been considerably formalized in the UK, where the Arts and Humanities Research Council provides assessment and oversight of performing arts research.

Library support for performing arts research already occurs in the archival and reference settings. General archives contain performing arts materials, including sound recordings and manuscripts, and specialized performing arts archives are common in larger research settings. These archives may specialize in multimedia and recordings, unpublished archival collections and ephemera, published collections, or a mix of all types of materials. In support of performing arts research, the depth of the archived content combined with the domain expertise of the archivist offer significant potential for innovation in support of performing arts and the needs of performing artists as researchers. In a study of theater research practices, Francesca Marini explores the complementary roles of practitioners and librarians within a culture of collaboration that extends beyond the traditional archive setting.³² Beyond locating and retrieving sources of relevance, librarians possess a “comprehensive knowledge that...allows them to point out internal and external connections that users would not otherwise be able to see.”³³ Because, as Marini observes, performing arts librarians and archivists are often themselves practitioners,

³¹ Digital Curation Centre, “What is Digital Curation?” <http://www.dcc.ac.uk/digital-curation/what-digital-curation>.

³² Francesca Marini, “Archivists, Librarians, and Theatre Research.” *Archivaria* 63, no. 7 (2007): 7-33.

³³ *Ibid*, 26.

they bring a high level of interest and engagement to the research process and may support theater (and other arts) research through promotional activities or through the organization of conferences and seminars.³⁴ In this way, collaborations between librarians and performing arts researchers can extend beyond traditional site-based services and into direct engagement with the community. As librarians investigate potential avenues of data curation in the performing arts, the outcomes and insight gained from such collaborations can provide a framework for value added documentation and dissemination strategies.

In addition, the work of organizations including the United Kingdom's Arts and Humanities Data Services (AHDS) and the International Research on Permanent Authentic Records in Electronics Systems (InterPARES) demonstrate that research bodies internationally are already focused on developing capabilities to acquire, preserve and deliver dynamic multimedia content through a variety of digital library architectures and services.³⁵ ³⁶ While the development and maintenance of such systems introduces questions of sustainability and may require significant overhead and resource allocation, the non-textual nature of much performing arts material requires unique features to capture and sufficiently describe content in support of discovery and usability. As stated by Jones, Abbot and Ross, "Since many performers use archives as sources of inspiration for new works, performance records should arguably be more creative and experimental in nature."³⁷

In an illustrative example, Jasmine and Warning describe the development of a metadata profile to facilitate the standardization and documentation of Chinese musical scores. Challenges to the development of a sufficiently robust yet streamlined data model include not

³⁴ Ibid, 29.

³⁵ Arts and Humanities Data Service. "Enabling Digital Resources for the Arts and Humanities." <http://www.ahds.ac.uk/>.

³⁶ International Research on Permanent Authentic Records in Electronic Systems. "InterPARES Project." <http://www.interpares.org/>.

³⁷ Sarah Jones, Daisy Abbott and Seamus Ross. "Redefining the Performing Arts Archive," *Archival Science* 9 (2009):166.

just the characteristics of scores as documents, but cultural and artistic practices of Chinese composers and performers.³⁸ The end product provides a user interface which is searchable not only by title and composer, but also by instrument and soloist. Although not a multimedia archive, the degree of structural and musicological analysis undertaken in this case demonstrates how digital libraries and archives can adapt processes and document models to enhance discoverability of resources by practicing musicians and performing artists.

Beyond discoverability, current discussions regarding the development of comprehensive document models for the capture, preservation and archiving of performances as events^{39 40 41} introduce questions about the capabilities of digital libraries and databases to fairly represent the dynamic and ephemeral nature of performance. A record of a performance is not a performance, and cannot by definition convey the subtle interactions between artist, venue, and audience which add character and vitality to live art. For research into aspects such as repertoire and technique, the issue may appear trivial and beside the point. However, when viewed from the perspective of pedagogy and the performing artist's imperative to acquire and transfer tacit and embodied knowledge, questions about what is documented by a live recording, and more generally about the scope of performing arts archives as data repositories, become more pertinent. In an example provided by Linda T. Kaastra, detailed observations of performers preparing for the recital of a challenging piece of music note the processes by which they develop their feel for the sound within the venue:

“The recital hall makes this a flattering process, since the sound in this hall is automatically live and full. They are checking in with that liveness to see how it feels today, if it feels good, the show will succeed. If it doesn't the performance will be tough

³⁸ Koo Ching Lan Jasmine and Peter Warning. “Metadata Design for Digital Chinese Orchestral Scores with Instrumental Parts,” *Fontes Artis Musicae* 55, no. 2 (2008): 297-339.

³⁹ Jones, Abbott and Seamus Ross. “Redefining the Performing Arts Archive,” 165-171.

⁴⁰ Matthew Reason, “Archive or memory? The detritus of live performance.” *New Theatre Quarterly* 19, no. 1 (February 2003): 82-89.

⁴¹ Philip Auslander, *Liveness: Performance in a Mediatized Culture*. London: Routledge, 1999.

slogging.”⁴²

The question could be asked, if some future student were to view or listen to a recording of the eventual performance for a study of technique, to what extent would she be observing “success” versus “slogging” techniques? Such a recording might be aesthetically satisfactory and would still contain data available for interpretation by other performing artists, but the complete context of the original performers’ experience would remain unknown. That lack of context has implications for the preservation of the performance as data.

To address this lack of context, models of documentation and presentation are needed which render explicit the qualities of practice and performance as iterative, analytical processes, with existing literature pointing to promising intersections between the research data lifecycle and the artifacts of practice research. In particular, various modes of reflective, analytical and exegetical writing have been referenced by studies including Bennett, Wright and Blom,⁴³ Reiner and Fox⁴⁴ and Odam.⁴⁵ Although the legitimacy of such writings is contested, with Phillips, Stock and Vincs⁴⁶ and Kaastra⁴⁷ eloquently observing that the knowledge embodied within performing arts practice is changed when translated into written text, the question of legitimacy falls generally on the use of written text as a substitute for or supplement to the assessment and evaluation of creative output. With regard to the annotations and process writings of performing artists as data points rather than end products, the value of reflective

⁴² Linda T. Kaastra, "Performance Inquiry and Cognitive Science: A Search for Common Ground." *College Music Symposium* 48, (2008): 136-137.

⁴³ Dawn Bennett, David Wright, and Diana M. Blom. "The Artistic Practice-Research-Teaching (ART) Nexus: Translating the Information Flow." *Journal of University Teaching & Learning Practice* 7, no. 2 (2010), Article 3.

⁴⁴ Thomas Reiner and Robin Fox. "The Research Status of Music Composition in Australia." *Australian Journal of Music Education*, no. 1 (2003): 3-9.

⁴⁵ George Odam, "Teaching Composing in Secondary Schools: The Creative Dream." *British Journal of Music Education* 17, no.2 (2000): 109–128.

⁴⁶ Maggie Phillips, Cheryl F. Stock, and Kim Vincs, "Dancing Doctorates Down-Under? Defining and Assessing 'Doctorateness' when Embodiment Enters the Thesis," In *Dance Dialogues: Conversations Across Cultures, Artforms and Practices. Refereed Proceedings of the World Dance Alliance Global Summit*, ed. Cheryl F. Stock. (Brisbane, Australia, 13-18 July 2008).

⁴⁷ Kaastra, "Performance Inquiry and Cognitive Science," 131-156.

writings is more firmly established. Kaastra⁴⁸, Odam⁴⁹ and Blom, Bennett and Wright⁵⁰ describe the utility and practice value of various forms of journal keeping and annotation. Kaastra's description of the evolution and categories of notation practices of musicians preparing for a performance is particularly interesting in that it not only documents the performer's study of a piece, but it also demonstrates the creation of a framework within which the performers may "move" and react to the audience and environmental characteristics of the performance space.⁵¹ Properly documented and described, these notations provide significant insight into performance led research practices and stand as significant data points worthy of curation. By making such notations available alongside the performance of a recording, the question of whether any given performance is best studied as an example of successful or adaptive, "slogging" techniques can be more fully addressed.

Additionally, the easy availability of video and audio annotation tools presents an opportunity for librarians and researchers to embed data points into recordings of practices and performances. A video annotated in this fashion supports the data curation objectives of documenting methodologies and support for re-performance. The potential of making annotated media publically available would of course be dependent upon any access and use restrictions attached to source material such as background audio or soundtracks. In cases of copyright conflict, it may be possible to just extract the annotations themselves with the timestamps necessary for users to synchronize a reading of the annotations with a properly licensed copy of the performance.

Although the examples described above are illustrative, they are technologically feasible

⁴⁸ Kaastra, "Annotation and the Coordination of Cognitive Processes in Western Art Music Performance," In *International Symposium on Performance Science* (Toronto, Ontario. 2011).

⁴⁹ Odam, "Teaching Composing in Secondary Schools."

⁵⁰ Blom, Bennett and Wright, "How Artists Working in Academia View Artistic Practice as Research," 359-372.

⁵¹ Kaastra, "Annotation and the Coordination of Cognitive Processes in Western Art Music Performance."

and can be implemented using many commonly available repository and archive applications. Assuming that performing arts research data can be sufficiently distinguished and separately captured from performing arts scholarly output, this data can be curated in support of explicating and evaluating creative methodologies, standardizing presentation formats, and supporting capabilities for re-performance.

As data curation becomes increasingly important to librarians and our patrons, we must make an effort to understand what data is to the performing artist. Without this understanding, librarians will continue to curate traditional data from the sciences and humanities, without considering the needs of the performers. Librarians, archivists, and data curators should re-evaluate existing projects, such as performing arts archives, with a new realization that libraries have already been curating performing arts data for many years, without calling it data. As new grants and funding sources are found for data curation activities, performing arts archives may be able to apply for these types of opportunities if we understand and can articulate how data curation in the performing arts is supported at our institution.