The Effects of Gender on the Organization of Personal Digital Music Collections

Jennie Ferris, Meghan Hansen, Deena Liatsopoulos and Lisa Shen

McGill University

Professor Catherine Guastavino

GLIS 611

April 10, 2008

Abstract

Digital music players and libraries are taking over from traditional music collections, but the study of their organization is in its infancy. Knowing if women and men organize their personal digital music libraries differently would allow the creators of iTunes and MediaPlayer to make necessary adjustments to their products in order to provide the maximum satisfaction to their costumers. A survey was conducted by asking questions regarding the number of playlists and songs people have in their collections, along with the psychology behind their organization. Variations in the data regarding organization, complexity of the playlists and ownership of different programs will allow the researchers to draw conclusions regarding varying themes that emerge during the interpretation of the data. This study will provide a starting point for further, more in-depth case studies.

The Effects of Gender on the Organization of Personal Digital Music Collections

Within the field of digital Music Information Retrieval (hereafter MIR), there has been a recent outpouring of research, which can be broadly divided into three distinct yet interrelated focuses. Firstly is research observing MIR practices, and the means by which MIR occurs. A second focus concerns the need for benchmarking and standards to be established within this quickly growing field, to allow for the most efficient evaluation and framing of the research being conducted. The third major focus is upon developing systems (software) to aid and improve MIR. Within this tri-faceted framework, specific studies have considered issues as varied as the classification of moods in music (Skowronek, McKinney & van de Par, 2004), searching and browsing strategies within a CD store setting (Cunningham, Reeves & Britland, 2003) and the classification of queries submitted to "Google Answers," Google's "ask an expert" offering (Bainbridge, Cunningham & Downie, 2003).

Of particular interest to the current study are prior research processes and studies conducted concerning the ways in which individuals organize their personal music collections, and the role of gender in this process. Whereas early studies focused moreso upon larger digital libraries serving multiple users (e.g. Bainbridge, Nevill-Manning, Witten, Smith & McNab, 1999), with the advent of ever-increasing accessibility to quickly developing technology, more and more individual music listeners are utilizing software / computer-based applications to facilitate the organization and retrieval of the music in their personal possession. Within this more specific realm of music information study, the topics that have been investigated are consistent with the three overarching categories above. Surprisingly, there have not been any readily apparent studies whose principal focus is to evaluate the potentially divergent ways in which males and females organize their digital music collections; exploring this arena will be the aim of the present study.

This is not to say that studies have not considered gender to some extent. To the contrary, a number of studies mention gender. However, in numerous cases this mention is either passing, is not developed, or even may illuminate experimental flaws or serious limitations. An ethnographic study of music information seeking in retail and library settings, despite listing the gender makeup of the interview

population (3 female, 4 male) and an even smaller focus group, also notes that participants were volunteers self-selected from amongst the researchers' acquaintances and colleagues" (Cunningham, Reeves & Britland, 2003); this not only forces the reader to question the generalizability of this study based upon sample size, but also upon sample composition, as self-selection from specialized researchers' peer group(s) is not often representative of a larger population or demographic makeup. A similar concern may be noted upon reading Vignoli's study concerning users' interactions with digital music (2004). The article appears initially promising regarding the focus upon gender, inasmuch as it cites Schuessler's previous study (1980), which demonstrated that "women were more interested in music than men, as well as having different tastes" (Vignoli, p. 2), and goes on to note that although gender is not the primary consideration of his study, "It seems that women in general less likely have technical background and experience with new technologies than men. For this reason technology could be the barrier because,[sic] the main source of digital music consists today of web download and sharing tools" (p. 2-3). This statement is of interest for the present study, while the former statement warrants the question of how women's organization of music may differ from men's, in light of the greater interest and different tastes that Vignoli claims they demonstrate. However, upon closer inspection, the very small size of the pilot study (one participant) as well as the small sample population of subjects interviewed -- six males and one female -- (p. 2) forces the reader to question both the research outcomes and whether Vignoli is generalizing to the population of women music listeners based upon an interview with one woman, which would scarcely be responsible scholarship.

Fortunately, other articles did note gender distribution and had a more substantial sample size. In "The Pain, The Pain…", researchers studied participants' music information behavior through their responses to an online survey asking for their votes for the worst song ever; the resulting 395 responses and fairly comparable gender distribution (182 female and 177 male respondents) are noteworthy for their thoroughness (Cunningham, Downie & Bainbridge, 2005). However, the authors do not directly address either similarities or differences between the music information behavior demonstrated by male and female respondents. Another Downie collaboration employs gender in its two-part stratified random

sampling approach (taking into account gender and academic status) with a substantial sample size of 427 respondents, but fails to draw conclusions regarding the results of participants' gender after investigating their title theme of "music information needs, uses and seeking behaviours" (Lee & Downie, 2004).

Given the lack of gender-focused research regarding the organization of personal music collections, it is unavoidable that context provided in this direction be from a primarily non-gender-specific body of research. The organization of music in personal collections is impacted by hierarchy, mood, genre, and purpose, and may occur within playlists or mixes. This organization impacts the browsing and searching functions of navigation by the user. The former [organizational] sections will be treated briefly at this time. Most often, a hierarchical organization is used within personal digital music collections, generally surrounding the elements of artist/group name, album and song (Vignoli, 2004; Cunningham, Bainbridge & Falconer, 2004). Genre and mood classifications posed interesting challenges, which will be elaborated shortly. For now, suffice it to say that the specific genres and moods both proposed through the course of studies and observed in users' collections were quite variable, numerous, frequently ambiguous, and often defied efforts towards consistency (Cunningham, Jones & Jones, 2004; Cunningham, Reeves & Britland, 2003). Studies are now placing an increased emphasis upon "real-life" or "everyday-life" music needs and strategies (Laplante & Downie, 2004, p. 1); the purposes for or activities accompanying listening to music vary widely, and may include determining music for or related to particular events, activities or emotions (Kin & Belkin, 2002, p. 1, 5). This in turn may lead to additional organizing schemes based upon purpose, such as "gym music" or "study music", or simply to purpose-built sub-collections (Cunningham, Reeves & Britland, 2003; Cunningham, Bainbridge & Falconer, 2004, p. 10). By considering everyday activities with ties to music, one may arrive at the corresponding practical implications for designing personal digital music collections (Cunningham, Jones & Jones, 2004); researchers frequently wrote about the importance of tying research directly to practical, "real-life" issues.

Alarmingly, one of the very consistent components of most articles in this field is the inclusion of a disclaimer, either emphasizing the lack of research in a specific subject or research area, or bemoaning

the dearth of benchmarks or standards of evaluation. For example, researchers have noted that "music listening is a badly understood phenomena today" (Pachet, La Burthe, Zils & Aucouturier, 2004, p. 1037), which certainly suggests that music listening and the organization of music that facilitates that listening is an area warranting further investigation. Researchers also note the context and lack of previous studies. Lee and Downie (2004) observe the scarcity of real-life user studies in MIR; Downie detects a disconnect between MIR researchers' assumptions regarding music queries' nature and the real-world situation (2004, p. 16), while Gulik, Vignoli and Wetering (2004) note the dearth of literature regarding music navigation and browsing.

Researchers likewise observe the challenges of this field, making discouraging conclusions that determining easily judged musical excerpts for mood classification studies is difficult, "even for an experienced listener" (Skowronek, McKinney & van de Par, 2004, p. 2), and that the issue of genre classification is likewise much-needed and poorly defined (Parchet, La Burth, Zils & Aucouturier, 2004). Indeed, Byrd and Crawford (in Kin & Belkin, 2002) state that no predictable association of musical entities with meanings exists and that even experts cannot agree upon boundaries; this is not a hopeful outlook upon the issues of genre and mood classification or standardization, and points to an area of music organization that is still fairly unstandardized. For their part, Reiss and Sandler (2002) contribute to voicing a need for benchmarking systems in the MIR field and propose a preliminary set of benchmarking techniques, noting both the disparities between the features, goals and implementations of existing MIR systems, and that it is challenging to determine what MIR system will consistently return the best, most relevant matches. This builds upon Downie's point (2004, p. 12) that research teams have been unable to scientifically compare and contrast their work due to the lack of standardized performance task sets and evaluation metrics.

In a thought-provoking philosophical address on the subject of MIR, C. Grund notes that "The study of how various groups and cultures categorize the music in which they are interested (or not!) becomes a cardinal point in the development of more sophisticated tools for MIR. An important side effect of this research is increasing refinement of our insights into how different groups approach their

music" (2005, p. 10). For the reasons enumerated previously, the proposed study that follows is considered as an exploratory study; it will consider in-depth an approach to the subject of gender tendencies within personal music organization, an area that has received negligible previous focus, with the aim of furthering the research community's awareness of the impact of gender upon the organization of personal music collections. Downie (2004) emphasizes the need for the continual accumulation of additional musical information; it is intended that this study will contribute in that regard. Grund further reflects upon the opportunity, through MIR research, for members of various cultures to arrive at a fuller understanding of the insights into how "various cultures hear their own music"(2005, p. 9). This may be extended to consider the various communities of which a given culture is comprised.

It has been observed that, although there is limited literature on the psychology of collecting behaviors, there is little doubt that the explosion of consumer formats for storing music digitally is changing the meaning of personal record / music collections (Giles, Pietrzykowski & Clark, 2007). The internet's role as a music distribution channel is contributing significantly to these developments, enabling a new community of digital music (Torrens, Hertzog & Arcos, 2004). It is hoped that this present research will, in this important transitory period, provide greater insight into the relationship between gender and digital personal music collection organization; resulting conclusions will likewise consider correlational and potentially causational implications of technological facility.

Hypothesis

Due to the lack of previous studies in this particular area and the exploratory nature of our study, we did not formulate a directional hypothesis. We are instead working with the null hypothesis, that there is no difference between men and women’s organization of personal digital music collections. However, it is anticipated that a more detailed and in-depth case study will follow this exploratory survey and that, at that point, the researchers will be able to build on the results found here, and formulate a directional hypothesis.

Methodology

This study seeks to better understand how men and women differ in their use of the extended capabilities of digital music storage and retrieval programs to maximize the organization of their personal digital music collections. For this purpose, a survey has been developed, and administered to participants in a controlled setting. The survey uses both quantitative and qualitative questioning, giving the researchers a broad foundation on which to base their findings. It is directed towards users of two generic, easily accessible digital music storage and retrieval programs, Windows MediaPlayer and Apple's iTunes. The research focuses on these two programs specifically because they are readily accessible, either as part of the basic program package that comes with a computer, or as free programs given with the purchase of a personal music player, either mp3 or iPod.

Participants

The participants were all recruited from the population of students enrolled in the course General Psychology 100 at the University of Maine at Farmington, all of whom have personal digital music collections and are users of either MediaPlayer or iTunes. The participants were recruited in equal numbers of men and women, for a total of 100 respondents. This population was chosen because, as a required course for all undergraduates at UMF, the recruited respondents should be representative of the student body as a whole, and thus extrapolations can be made between the sample population and students as a group.

Administration of the Survey

Once the survey was piloted with a small number of respondents, and corrections, additions and changes made, it was administered over a series of three days. Each respondent was given an appointment time at a computer laboratory on the campus of the university. The survey was administered via computer-assisted self-administered interviews (CASAI), to allow each respondent as much flexibility as possible with regard to time allowed for completion and to gather as much information as possible from each respondent as responses to the open-ended questions. The use of this program also allowed for more detailed analysis of the data collected, as the data was fed directly into a program for statistical analysis.

All participants were asked to look at their digital music collections before coming in to do the survey, specifically paying attention to the number of files or songs included, as well as the number and variety of playlists that they have created. For the questions related to these topics, the respondents were asked to be as specific as possible, and this data was important for compiling and analyzing the statistics generated from the results.

Each survey starts with a short demographics section, including age and gender questions, as well as asking if the respondent would be willing to be contacted if further information is required. To enable this, each participant was given a participant control number, so that the information from the survey can be linked to identification information for the participants who agree to be contacted after the initial survey. This contact will be researched in a further case study, looking into much more specific cases of both male and female participants who use the digital media programs more fully than their counterparts.

After these preliminary questions, the respondents were asked which of the programs they use, and how long they have been using the program of their choice. The length of time that new users have been working with a program may affect how many of the additional options they have had time to explore, and therefore how completely they are able to use the extended capabilities of said program. In addition, those who have a small digital music collection, or one that does not span a wide range of music, may also be content with the traditional organizational model of music, involving only Artist, Genre, and Album or song Title, and so may not be using these capabilities either. Thus, respondents were asked to identify the genres included and the extent of their collections. This information helped the researchers analyze the data to its fullest extent.

The researchers were interested in gathering information specifically related to the capabilities within these programs of developing playlists, or placing individual songs into multiple organizational schemes that can be arranged around whatever the user thinks is pertinent. The majority of the questions in the survey relate to the number of playlists that respondents have created for themselves, and the behaviours exhibited while creating and using their self-created playlists. The last question is a more general one about possible improvements to the program being used. This, it was hoped, would allow the

respondents who were already thinking about the specific extended capabilities of their programs, to elaborate further ways that they would be interested in using the programs. The responses given provided additional insight into the uses that respondents had found for the programs in question.

Results

Our analysis of digital music user responses will include a review of preliminary findings of the quantitative survey data and possible interpretations for future digital MIR system designs based on descriptive user feedbacks. Of the 50 male and 50 female participants surveyed, only responses from those who have completed the entire questionnaire will be included.

For the statistical analysis of quantitative survey questions, t-test and chi-square with repeated measures on different variables will be performed on the two gender groups to inspect any statistically significant differences in male and female digital music users' organizational behaviours. Specifically, t-test will be performed on questions 2 and 4, which examine whether there are significant differences between the average sizes of participants' personal digital music collection in different gender groups. As for the rest of the questionnaire's nominal and ordinal quantitative data, chi-square would be used to examine potential statistical gender group differences. Questions 3, 5, 6, 7, and 8 look at the complexity of the participant's collection in terms of the number of playlists made and categories used for organization; while questions 10, 11, and 12 concern the extent to which the participant utilizes the different functions offered by his or her digital music storage and retrieval programs, including functions of random selection, deletion and reorganization of the collection and specific playlists. In addition, secondary chi-square and t-test with repeated measures of the same variables will be performed to examine any potential interactions between gender and ownership of different MIR programs on the organizational styles of users, the MIR programs examined will primarily be Apple iTunes and Windows MediaPlayer, as identified in question 1.

As for the seven qualitative questions which solicit open-ended response from participants, second-order interpretation will be applied to the responses in order to code the answers into consistent conceptual categories. Two researchers will be coding the same data set independently to ensure

intercoder reliability. Third-order interpretation will follow to complete the analysis by identifying theoretically significant concept clusters in terms of preferred digital music storage and retrieval program features and predominant play list organizational style by different gender group or users of different MIR programs.

Discussion

This is an exploratory study aimed to identify the potentially divergent ways in which males and females utilize MIR programs for organizing their personal digital music collection. The findings of this study would further the understandings of MIR in the context of gender differences, and could have potentially important implications on the designs and modifications of current and future personal digital music storage and retrieval programs.

Nonetheless, there are several limitations to the present study. Firstly, due to its exploratory survey format, the current study's analysis of participants' utilization of digital music storage and retrieval programs is based strictly on participants' self-report from memory. To improve reliability of the results, more in-depth additional case studies have been planned by selecting participants, from the current study, who have indicated willingness to be contacted. The future study will consist of semi-structured interviews and on-site observation of the interviewees' digital music collections to gain a deeper understanding of their digital music organizational behaviour.

In addition, the study's sample population is based on male and female college students; therefore the findings are limited to the gender differences in MIR utilization behaviour of a particular age group. Future studies should be expanded to digital music collectors of different age categories to improve the external validity of these findings, or potentially examine age as another variable in MIR usage pattern. In addition, individuals with mixed music collections in both digital and record format may be another interesting prospective population for investigation, as some of the older age groups would likely be in possession of both.

The present findings provide a good departure point from which we can further investigate the relationship between digital music collectors' inter-personal characteristics, such as gender, and the extent

to which they utilize the capabilities of digital music storage and retrieval programs to maximize the organization of their personal digital music collections.

References

Bainbridge, D., Cunningham, S. J., & Downie, J. S. (2003). How people describe their music information needs: a grounded theory analysis of music queries. *Proceedings of the Fourth International Conference on Music Information Retrieval*, 221-222.

Bainbridge, D., Nevill-Manning, C. G., Witten, I. H., Smith, L. A., & McNab, R. J. (1999). Towards a digital library of popular music. *Proceedings of the Fourth ACM International Conference on Digital Libraries*, 161-169.

Cunningham, S.J., Bainbridge, D., & Falconer, A. (2004). 'More of an art than a science': supporting the creation of playlists and mixes. *Proceedings of the Seventh International Symposium on Music Information Retrieval (ISMIR)*, 1-6.

Cunningham, S.J., Downie, J.S., & Bainbridge, D. (2005). 'The pain, the pain': modeling music information behavior and the songs we hate. *Proceedings of the Sixth International Symposium on Music Information Retrieval (ISMIR)*, 474-477.

Cunningham, S. J., Jones, M., & Jones, S. (2004). Organizing digital music for use: an examination of personal music collections. *International Symposium on Music Information Retrieval (ISMIR)*, 1-8.

Cunningham, S., Reeves, N., & Britland, M. (2003). An ethnographic study of music information seeking: implications for the design of a music digital library. *Proceedings of the Joint Conference on Digital Libraries*, 5-16.

Downie, J. S. (2004). The scientific evaluation of music information retrieval systems: foundations and future. *Computer Music Journal*, 28.2, 12-23.

Giles, D.C., Pietrzykowski, S., & Clark, K.E. (2007). The psychological meaning of personal record collections and the impact of changing technological forms. *Journal of Economic Psychology*, 28.4, 429-443.

Grund, C. (2005). Music information retrieval, memory and culture: some philosophical remarks. *Proceedings of the Sixth International Symposium on Music Information Retrieval (ISMIR)*, 8-12.

Gulik, R.v., Vignoli, F., & Wetering, H.v.d. (2004). Mapping music in the palm of your hand, explore and discover your collection. *International Symposium on Music Information Retrieval (ISMIR)*, 1-6.

Kin, J-Y., & Belkin, N. (2002). Categories of music descriptions and search terms and phrases used by non-music experts. *International Symposium on Music Information Retrieval (ISMIR)*, 1-6.

Laplante, A., & Downie, J.S. (2004). Everyday life music information-seeking behaviour of young adults. *Proceedings of the Seventh International Symposium on Music Information Retrieval (ISMIR)*, 1-2.

Lee, J.H., & Downie, J.S. (2004). Survey of music information needs, uses, and seeking behaviours: preliminary findings. *Proceedings of the International Symposium on Music Information Retrieval (ISMIR)*, 441-446.

Patchet, F., La Burthe, A., Zils, A., & Aucouturier, J.-J. (2004). Popular music access: the Sony music browser. *Journal of the American Society for Information Science and Technology*, 55.12, 1037-1044.

Reiss, J., & Sandler, M. (2002). Benchmarking music information retrieval systems. *JCDL Workshop on the Creation of Standardized Test Collections, Tasks, and Metrics for Music Information Retrieval (MIR) and Music Digital Library (MDL) Evaluation*, 43-48.

Skowronek, J., McKinney, M.F., & van de Par, S. (2004). Ground truth for automatic music mood classification. *Proceedings of the Seventh International Symposium on Music Information Retrieval (ISMIR)*, 1-2.

Torrens, M., Hertzog, P., & Arcos, J. (2004). Visualizing and exploring personal music libraries. *Proceedings of the International Symposium on Music Information Retrieval (ISMIR)*, 421-424.

Vignoli, F. (2004). Digital music interaction concepts: a user study. *International Symposium on Music Information Retrieval (ISMIR)*, 1-6.

Appendix

Survey- Use of digital music organisation software

Participant Control #: _____

Age: _____

Gender: M or F

Can we contact you for further information? Yes or No

Instructions: For each question, unless otherwise indicated, circle the answer that applies to you.

1. a) Which program do you use?

   Windows MediaPlayer

   Apple's iTunes

   Both

   other: (please indicate which program)_____

   b) How long have you been using your current program?

   less than 3months

   3-6 months

   6-12 months

   1-2 years

   2 years or more

2. How many files or songs are in your collection of digital music? _____

3. What musical styles/genres does it represent? Circle all that apply

Alternative	New age	Soundtracks
Classical	Pop	Standards
Electronica	Rap	Light Rock
Folk	R&B	Soul
Heavy metal	Rock	Jazz

Other (list all that apply) _____

_____

4. How many playlists have you created? _____

5. Do you create your playlists around:

Activities	Events
Favourite songs	Moods
Seasons	

Other (list all that apply) _____

6. Within each category above, do you further separate your collection into playlists? Please give some examples where appropriate.

   Eg: You may have many playlists that fit the category Moods, each intended to accompany a different sentiment: happy, sad, or lonely

7. On average, how many tracks do you put in a playlist?

   1-20

   21-40

   41-60

   61-80

   81-100

   over 100

8. Do you have individual songs in more than one playlist?

   Many Some Few None

9. Which playlist(s) have you listened to the most since you've begun using your player?

10. Do you use the Shuffle or Random function on your player? Yes or No

    If yes, do you use it when listening to your entire collection, only within one playlist, or in both situations?

    Whole collection

    Playlist

    Both

11. Do you delete songs from your playlists?

    Often Sometimes Occasionally Rarely Never

    Please state the reason

12. Do you delete playlists from your program?

    Often Sometimes Occasionally Rarely Never

    Please state the reason:

13. If you could improve something from your selected program, what would it be?