BEHIND THE SCENES: PEDAGOGICAL INSIGHTS FROM AN ADULT GROUP PIANO COURSE IN A SPEECH PERCEPTION STUDY

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A common complaint amongst older adults is the inability to understand conversations in noisy environments. Correlational research suggests that long-term music training may improve older adults' speech-in-noise processing and the cognitive and perceptual underpinnings thereof; however, music training's effect on speech-in-noise processing has not been studied experimentally. Although music training has been used as an intervention in studies investigating topics spanning from cognitive, perceptual, general quality of life, and even speech perception in children, the methodology of the music interventions has never been reported in detail. Published details of music interventions are integral to the reproducibility of a study's results. Therefore, this article focuses on the facilitation and content of a ten-week group piano course that functioned as part of an experimental study testing the extent to which group piano lessons mitigated age-related declines in speech-in-noise processing. Participants were healthy adults ages 60 to 80 (mean age 67.3 years) with fewer than three years of formal music training. We have compiled pedagogical strategies, tips, and considerations resulting from this ten-week piano course for older adults.

INTRODUCTION

In 2015, the United Nations reported that one in eight people worldwide was at least 60 years old. Due to longer life expectancy and decreased fertility rates worldwide, the trend is expected to increase such that one in six people will be at least 60 by 2030 (United Nations 2015, p. 3). Importantly, these rising numbers show the necessity of addressing the impact an ageing population will have on global health.

Considerations for how to maintain, and even increase, physical and mental quality of life is vital for promoting healthy ageing but health professionals, researchers, and music educators have been slow to adapt to challenges and opportunities that exist in this changing demographic. Educating, motivating, and engaging mature adults is crucial to foster healthy ageing. Research suggests numerous benefits of music training for older adults including improved cognitive function and mental well-being, which is discussed in this paper. However, scientific studies discussing the benefits of music training for older adults fail to include key components of the music curriculum and demonstrate how the content of a music course can affect the results and overall experience for the learners. Furthermore, a critical gap exists in the current training of music educators which may contribute to the current underrepresentation of adult learners in music study around the world. In an effort to begin to bridge this gap and advocate for the involvement of senior adults in music lessons, this overview synthesizes reports and research on the current state of senior adult music learners, benefits of music making, and foundations of adult education.

Low Prevalence of Older Adults in Music Activities

In 2005, the *White House Conference on Aging* condensed thousands of recommendations involving arts, health, and ageing into three primary objectives: (1) invest in research; (2) identify model programs for dissemination; (3) promote partnerships for program development and awareness between art and health sectors. Since the presentation of recommendations, key actions resulted in advancements in the integration of arts participation and healthy ageing (Hanna, Noelker, & Bienvenu 2015, p. 272). For example, the U.S. government funded a landmark study examining the impact of weekly choir participation on the physical and mental health of older adults age 64 and over (Cohen et al. 2006). Participant involvement in the chorale program resulted in fewer doctor visits and a decrease in the use of over-the-counter medications compared to older adults who did not participate in music making.

Despite the positive impact music participation can have on quality of life, an alarmingly low percentage of adults in the United States engaged in music lessons in 2012 (*A Decade of Arts Engagement* 2015). Similar findings hold true in Sweden where a survey completed by healthy older adults (aged 65+) showed that 87.6% of participants did not currently engage in playing a musical instrument (Sörman et al. 2014, p. 499). In contrast, Australians reported an *increase* in music participation among adults 65 and older from 2009 to 2013 (Australia Council for the Arts 2014, p. 59), suggesting it is feasible to provide sustainable learning opportunities for the ageing population.

Non-Musical Benefits of Music Engagement

To better understand the role music engagement plays in the lives of seniors, we compiled a non-exhaustive review of the non-musical benefits of musical engagement. Research on the non-musical benefits of arts participation in older adults examines participation in activities such as singing in choirs, dance, writing, theatre, painting, and playing the piano (Noice, Noice, & Kramer 2014). A large body of research suggests that active music making, such as singing in a choir or playing an instrument, engages the body and creative mind enough to positively benefit emotional well-being, decrease symptoms of depression and anxiety, and enhance immune system response (Cohen et al. 2006; Clift et al. 2012; Hays & Minichiello 2005; Hillman 2002; Koga & Tims 2001; Kreutz et al. 2014). Using questionnaire measurements, Creech et al. (2013) revealed that older adults who participated in musical activities scored significantly higher in domains of control, autonomy, self-realization, and pleasure, in addition to subjective well-being, when compared with those engaged in nonmusical activities. After 3-4 months of active music making, older adults' perception of their physical and psychological health improved significantly with participants also reporting fewer

symptoms of depression (Clift et al. 2012; Seinfeld et al. 2013). Positive changes in physical and psychological health domains were more pronounced after music making than with non-music leisure activities, implying that music training could confer greater benefit than leisure activities in maintaining and improving quality of life for ageing adults (Seinfeld et al. 2013).

For ageing adults, music engagement can be a source for making social connections, allaying stress, promoting physical well-being, and 'balancing the intellectual, emotional, and spiritual facets of their lives' (Hays & Minichiello 2005, p. 269). Older adults in the Hillman (2002) study reported statistically significant improvements in their perception of emotional well-being and quality of life resulting from participation in a community choir program. One participant commented, 'Being part of [the choir] helps to forget all my silly aches and pains when I need to the most...singing together is very therapeutic for me', while another said, 'I was alone and withdrawn. I had isolated myself. Through my involvement with [the choir] my self-esteem has improved. I love singing. I am surrounded by like-minded people and have learned to live in the present' (Hillman 2002, p. 166). Coffman (2008) surveyed members of community bands for older adults regarding their music making experience and one amateur musician summarized the non-musical benefits of music engagement as:

> The emotional responses create a sense of well-being; participating in a [community band] binds people together in a common effort. Music is a liberating gift that brings healing where it's needed. Membership in an [community band] transforms retirement living through achieving a healthier lifestyle (p. 386).

Perhaps well-being and quality of life benefits are achieved by allowing people to express themselves through music, thereby adding another unique function of music playing in the process of successful ageing.[1]

Music lessons involve novel and challenging tasks, progress in difficulty, affect self-efficacy, self-esteem, and motivation, all while integrating visual, auditory, and tactile information (Bugos et al. 2007). All of these elements play a role in musical and non-musical benefits. Adults who had instrumental music training significantly outperformed older adults who did not receive instrumental training on measures of cognitive abilities such as verbal working memory, nonverbal memory recall, and visuomotor speed (Hanna-Pladdy & MacKay 2011; Hanna-Pladdy & Gajewski 2012). In addition, an increase in robustness of the neural encoding of speech sounds (Chandrasekaran, Krishnan, & Gandour 2009; Kraus & Chandrasekaran 2010; Wong, Perrachione, &

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[1] For a more extensive review, see Lehmberg & Fung 2010 and Fung & Lehmberg 2016.

Parrish 2007) and improved non-native speech discrimination (Gottfried, Staby, & Ziemer 2004; Marie et al. 2011; Smayda, Chandrasekaran, & Maddox 2015) are associated with long-term music training. Musicians also outperform nonmusicians in speech-in-noise perception tasks across the lifespan (Anderson et al. 2012; Parbery-Clark, Anderson, Hittner, & Kraus 2012), potentially through both cognitive and perceptual means (Strait et al. 2010).

In numerous studies, musicians are often comparison subjects and continue to be of interest to researchers and scientists. As such, our knowledge of non-musical benefits of music training with learners of all ages is constantly expanding and supports the need for active participation in music making.

Adult Learners

An understanding of the framework surrounding the needs of adult learners can inform an educator on course content. Considering what an adult learner brings to the learning situation may help music educators establish a rapport with the learners leading to more success in the classroom. In a survey of 66 teachers of adult music learners, several teachers expressed that knowing the characteristics of adult learners would help in their teaching (Bowles 2010, p. 56). Similarly, an understanding of the developmental stages of children benefits teachers of younger students.

The early works of educators Eduard C. Lindeman, Harry Overstreet, Cyril O. Houle, and Malcolm Knowles form the foundational theories of adult education. In 1926, Lindeman delineated the following five key assumptions: (1) Adults are motivated to learn as they experience needs and interests that learning will satisfy; (2) Adults' orientation to learning is life-centered; (3) Experience is the richest source for adult's learning; (4) Adults have a deep need to be self-directing; (5) Individual differences among people increase with age (Knowles, Holton, & Swanson 2015, p. 22). Even now, these five assumptions remain applicable.

Music educators' awareness and understanding of the five factors described above can play a role in increasing learner motivation, which could lower attrition rates of adult learners. David Myers (2008) summarized the importance of the motivation factor in adult learners:

> If [adults] cannot connect their motivations – both immediate and long-term – with instruction, they will disappear. If they do not sense progress, they will become frustrated. If they do not feel affirmed in their efforts, they will give up. If they do not learn musical independence, they will worry about whether they are musically capable. But, most

importantly, if they are not touched at the level of intrinsic musical satisfaction, they will lose heart (p. 56-7).

Andragogical studies suggest that adult learners benefit most from content based on self-directed learning where the learners' involvement is guided by their need to know the why behind the learning, their feeling of being responsible for the learning, their life experiences, and their willingness to learn (Knowles, Holton, & Swanson 2015). Music educators would benefit from engaging with continuing education workshops, associating with mentors, and exploring relevant literature. Teachers of adult learners must develop the ability to design flexible lesson plans, navigate age-appropriate materials, and engage with each learner's goals and concerns (Bowles 2010). As a source for educators and researchers, we compiled best practices, tips, and considerations for group piano classes designed to engage older adult beginners.

Course Description

Classroom Setup

The keyboard lab was equipped with sixteen Roland digital pianos for the students, a Roland digital piano for the instructor, a Key Note Visualizer, chalkboards, and a projector connected to an internet capable computer. Because technology is increasingly relevant in the classroom, we created a YouTube channel to upload customized practice videos and recordings of each class and provide a playlist of music examples used in class. The videos allowed the learners to review class discussions.

Figure 1: Classroom setup

Scheduling

The course met three hours per week. For the first four weeks, we met MWF from 3:00 to 4:00 PM. After that, the course met twice per week for 90-minute sessions. The adjustment to the schedule was not planned from the outset, but the adults found it more convenient to attend twice a week. All participants agreed to meet for 90-minutes from 2:30 to 4:00 PM on Mondays and Wednesdays. The participants responded well to the longer sessions. During our group video interview, one participant commented that she 'always wanted the classes to keep going' and another demonstrated her incredulity at how quickly time passed for her.[2] It is worth noting that in a research survey of older adult music learners, 98% of adults preferred morning or early afternoon class times (Bugos 2014, p. 31).

Assignments

Imagine the fulfillment of seeing an entire class eagerly enter the classroom after willingly completing assignments simply because the task related directly to the course content. This scenario motivated us to continue reinventing lesson plans and assignments in response to our learners. We selected pages from Keith Snell's *Fundamentals of Piano Theory*, Level 1, to reinforce concepts covered throughout the ten-week course. Written assignments may be valuable for assessing learners, but it is important to maintain a 'pressure-free' environment without judgment, since adults are also managing home and work life. One participant said, 'There were [times] where I just couldn't finish the homework assignment...there was just too much going on in life that didn't let me do it. But there wasn't pressure to have it done for the next class...you had to do it, cause if you didn't do it you'd fall behind, but the pressure wasn't there to push yourself when life got in the way so it worked out well.' This participant also wanted teachers of adult learners to understand that the most welcoming approach to assignments is to simply request a task such as 'Read page 56 and understand it,' and then not carp about it. He emphasized that adult learners will read the material and understand it because they are intrinsically motivated to learn and do not need to be treated like children who are constantly critiqued and 'graded.'

Supplemental Learning

Charles Ball, a Steinway & Sons technician and head piano technician at the University of Texas at Austin, gave a demonstration session exploring several aspects of a Steinway Model D. Ball walked the adults through a brief history of the piano and various aspects

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[2] A month after the end of the course, we conducted a 60-minute group video interview session with eight of the participants in attendance.

of the inner workings of the instrument including the pin board, strings, and pedals. He also removed the action for the class to allow them to view all the moving parts. They were intrigued by the complexity of the instrument, along with its cost, and the amount of detailed work required to maintain these instruments. Fully engrossed in the 30-minute session, the adults developed a true appreciation for the instrument and piano technicians. For the participants, this experience proved to be a major highlight of the course and inspired them to consider investing in their own piano.

Figure 2: Demonstration with Steinway technician Charles Ball

Instrument Selection

Taylor and Hallam (2008) support the use of digital pianos for adult beginners since the available rhythmic and sound features can be used to bridge the discourse between 'modest performing skills' and expectations due to 'a lifetime's musical enculturation' (p. 289). The instructors used the features of the Roland digital piano throughout the course. The learners appeared to enjoy playing along with the percussion backgrounds and also liked using different instrument timbres periodically throughout the course.

Each participant received a Yamaha keyboard with 61 unweighted keys for the duration of the course. The primary investigator, Kirsten E. Smayda, selected this model based on price and considering possible hand strength and dexterity issues in older adults. However, we noticed the weighted keys of the Roland digital pianos did not affect our adults adversely during class since they were healthy and mobile. Our observation loosely lends supporting evidence for studies on older adults that found playing weighted or touch-sensitive keyboards could improve finger strength as well as decrease

discomfort associated with arthritis (Spirduso et al. 2002; Zelazny 2001). The discrepancy in available registers between the full-size classroom pianos and the practice keyboards became an obstacle as we developed staff and keyboard orientation. Therefore, we learned to be explicit with our music examples and demonstrations in class to facilitate their practice time at home. It would be ideal for all learners to practice on weighted 88-key pianos, however, since that may not be the case, it is crucial to know the type of instruments students use for practice.

TO ENGAGE AND BE ENGAGING THROUGH GROUP PIANO PEDAGOGY

This ten-week group piano course was co-taught by two pianists with additional assistance from the primary investigator, a researcher in the cognitive neuroscience field and musician herself. The class consisted of thirteen older adults (mean age 67.3 years). The course served as the music training intervention of an experimental study that tested the extent to which music lessons mitigated age-related declines in speech-in-noise processing (see 'Research Study Description' section below for study and participant details).

The interdisciplinary nature of this project challenged us to consider the research purpose, measurements, data collection, and course content when planning the classes. The learners' and instructors' curiosity for the science behind the study, and its interaction with the course content, enhanced all aspects of the course and scientific study. We constantly gauged the classroom environment and asked for direct feedback from the learners, which also shaped the course content. An underlying pliancy with the curriculum and use of classroom time, shaped by a constant feedback loop between instructors and learners, allowed us to grasp what was most beneficial and motivating for the adult learners. Questions and life experiences from any given class would frequently determine content of successive classes. In essence, a classroom environment that encourages questions and discussions of the relevance of course content to the learners' experiences could be considered fundamental to the success of older adult learners.

In addition to flexibility, variety also played a crucial role in the development of the course content. Along with reading and technique, participants also received instruction regarding transcription, transposition, composition, and active listening. The class explored a variety of musical compositions ranging from Bach, Beethoven, and Satie to Elvis Presley, Axis of Awesome, and Dave Brubeck. Despite the seemingly disparate nature of these composers and artists, they all collectively brought the course content to life. Because our participants have a lifetime of music listening experience, we used

familiar repertoire to introduce new concepts. We will explain the function of the musical selections used in this course in the section titled *Myth: Simple = boring.*

Finally, over the course of ten weeks, we established lasting personal relationships and a special rapport with the adult learners. Sincere enthusiasm from both the instructors and learners, respect for the adult learners' prior knowledge and life experience, and the learners trust in the instructors' subject knowledge all contributed to the growth of these relationships. Older adults in the Duay and Bryan (2008) study highlighted the importance of the previously mentioned qualities, along with the ability for instructors to be straightforward, engaging, and open-minded, as necessary for creating a positive, pressure-free learning environment. From our experience, it is apparent that adults value learning music and the social aspect of group learning environments. To encourage more teachers to explore the possibilities and opportunities in teaching adult learners, the following sections highlight myths that music educators may experience surrounding adult learners and group learning environments along with truths that promote positive teaching and learning experiences with input from our participants.

Myth: Piano lessons = private lessons

Piano lessons are frequently perceived as an activity that involves one student and one teacher. Learning the piano is frequently touted as a lonely endeavor since pianists do not have the same exposure to collaborative music making opportunities compared with students who play band or orchestral instruments. In a study examining perceptions of adults enrolled in group keyboard courses, half the participants preferred group over private instruction (Bugos 2014). In contrast, Bowles (1991) elicited a trend of prospective adult music learners preferring private instruction. One's preference for private lessons may be due to the tradition aforementioned and perhaps a lack of experience with positive group learning environments. As more group learning opportunities are offered, we may be able to shift learner preference. Some individuals with specific learning goals may be better suited for private lessons, but group learning and group music making environments provide a social aspect that is highly valued by adults (Coffman 2008; Roulston, Jutras, & Kim 2015).

Group piano lessons provide a platform for a class that focus more on the larger musical experience by incorporating aspects of music theory, music appreciation, and aural skills among other activities and skillsets. Learners benefit from courses that focus on more than skill acquisition. For example, collegiate group piano courses for music majors develop functional skills including harmonization, transposition, improvisation, and sight-reading in addition to repertoire. The aim of those courses is to deepen understanding of musical concepts. Wei (2008) found that young adult learners were more receptive to

learning about composition and harmonization during class after partaking in five music appreciation sessions prior to the start of class. With a bit of creative thinking, a group piano course is easily transformed into a comprehensive musical experience that aims to inform learners in how music is heard, constructed, interpreted, and understood. Regarding this, one of our participants said: 'I went to class expecting to learn the piano, but I learned a lot more than the piano. I learned how to appreciate music, I learned how to listen to the music, I learned how to read music, I learned how to write music, I learned how to play the piano, *and* I met a bunch of new friends.'

Myth: You need to be an expert on teaching adults and/or group class

To earn a degree in music, one may take a piano pedagogy course or two. That pedagogy course may even focused on group teaching, but most pedagogy courses primarily cover the building of foundational skills for teaching children in one-on-one lessons. With all the course requirements necessary for obtaining a bachelor's degree in music, undergraduate programs and professors face the challenge of incorporating an additional practicum that focuses on teaching adults into the degree plan. While there has been an expansion downwards to incorporate early childhood education, much more needs to be done to prepare educators for teaching adults and engaging the community in lifelong music making (Rohwer 2011, p. 123). Fortunately, there are numerous resources available for teachers interested in including the ageing population in their studio. The idea of 'becoming an expert' on adult learners may seem daunting since psychological learning constructs are ever-evolving and the literature on adult education is incredibly vast, but networking with colleagues who work with adult learners is a practical way to begin.

Knowledge accumulated from outside sources lead to a better understanding of adult learners. However, being mindful of our own learning experiences regarding motivation, challenges, and achievements is invaluable and builds strategies for effective teaching. Within andragogical principles, the music educator becomes a facilitator of the learning (Knowles 1975) and gaining familiarity with the characteristics of andragogical principles allow music educators to create more 'substantive and meaningful music education programs for adults (Dabback 2005, p. 8).'

Truth: Adults want to learn

Learning how to play the piano is a highly preferred leisure activity of many adults (Bowles 1991, p. 198) with dream fulfillment listed as the primary reason for studying piano (Jutras 2006, p. 103). Adults do not *need* to be in a piano class, they *want* to be there. In discussing their participation, one student wanted instructors to know that, 'We

are there because we want to be there.' We were pleasantly surprised by how invested our learners were in terms of the excitement, curiosity, and determination they exuded throughout the process. After the course, we measured our participants' motivation and enjoyment of the group class by having them rate 25 statements on a scale from 'Not at all true' to 'Very true.' As can be seen from the average ratings in Table 1, our participants put time and energy towards the learning because they found music to be engaging and believed learning how to play the piano was beneficial to them.

Table 1: Average ratings of participant responses from a survey measuring motivation and enjoyment given after ten weeks of music training (based off of McAuley, Duncan, & Tammen 1987, p. 50)

Statement	Average Rating (1: 'Not at all true', 7: 'Very true')
I am motivated to continue learning the skills I developed.	5.92
I believe that doing this activity is useful for improved attention/ concentration.	6.85
I believe this activity could be of some value to me.	6.85
I did this activity because I had to.	1.46
I learned something new at each meeting.	6.77
I participated actively throughout the whole activity.	6.08
I enjoyed doing this activity very much.	6.85
This activity was fun to do.	6.77
I did not try very hard to do well at this activity.	2.15
It was important to me to do well at this task.	6.23
I plan on spending time to be able to continue this activity.	6.15
I thought this activity was very enjoyable.	6.15
While I was doing this activity, I was thinking about how much I enjoyed it.	6.38
This activity did not hold my attention at all.	1.08
I followed the practice regimen strictly.	4.31
I tried very hard on this activity.	5.46
I plan on spending money to be able to continue this activity.	5.54
I believe doing this activity could be beneficial to me.	6.62
I did not put much energy into this.	1.62
I would be willing to do this again because it has some value to me.	6.31

I would describe this activity as very interesting.	7.00
I think this is an important activity.	6.15
I thought this was a boring activity.	1.00
I believe doing this activity could be somewhat beneficial for me.	6.92
I put a lot of effort into this.	5.46

Incorporate Prior Knowledge

Teaching adult learners involves working with prior knowledge and experiences resulting in a highly heterogeneous classroom dynamic. For teachers of adult music learners, a primary challenge might be to '[change] learned habits or preconceived ideas (Bowles 1991, p. 57).' Teachers can embrace the prior knowledge of learners from a positive perspective and use this knowledge as an advantage and tool for building classroom content. Ignoring or devaluing participants' prior knowledge can be harmful to the learning experience (Knowles, Holton, & Swanson 2015). Exploring and incorporating adult students' prior knowledge shows respect for their experience and builds rapport between the learner and the teacher.

Intrigue Their Inner Musician

As previously mentioned, the adult learners' musical experience can help structure and build course content. Older adults have immense musical backgrounds gained from a lifetime of attending musical events and listening to music. By teaching musical concepts through repertoire in which most students are familiar, they can explore new musical concepts existing in a piece of music they know. For example, *Can't Help Falling in Love* by Elvis Presley was used to introduce triple subdivision while Bach's Prelude in C Major from *Well-Tempered Clavier (Book I)* served as an example of duple subdivision. Not only did they understand these concepts, but they also felt them and embodied them while listening to the examples. Every musical concept discussed in this class could be paired with several pieces of music that are both familiar to the class and exhibit the concept at hand. Each student provided two pieces or songs from any genre in which they wanted to learn. These pieces and songs, along with others selected by the instructors, led to many open discussions regarding meter, rhythm, silence in music, instrumentation, rubato, and key, to name a few. By bringing excellent musical performances into our classroom, the feeling of being a 'beginner' can be replaced with being a musician, or at least someone who listens more like a musician. Though beginners in terms of technical skill, our learners carried out musical discussions with intelligence and insight. The adults' ability to draw parallels to their own professions,

employ high-level critical thinking, and assimilate this information added an emotionally and conceptually complex layer to the course.

Make the Most of Tangential Discussions

Occasionally, the questions learners pose may seem unrelated to the current discussion, but it is important to remember that learning is a process; their questions may stem from their attempts to reconcile new information with prior knowledge. It is crucial to address their inquiries in the moment since putting it off may seem dismissive. Since adult learners are genuinely inquisitive, their questions may lead to challenging musical topics that are not part of the lesson plan, but tackling tangential discussions can be gratifying for all involved.

For example, Debussy's *Claire de Lune* introduced compound meter of 9/8. We intentionally used this piece to demonstrate ambiguity in meter, since both composer and performer made it difficult to establish a strong sense of pulse or meter through listening without a score. Debussy opens with a rest on the downbeat (a term the learners knew) and frequently avoids downbeats of measures and the strong beats within measures. Debussy further obscures the metrical stability by including duple and triple subdivisions. The performer, Angela Hewitt, compounded the sense of metrical and rhythmic ambiguity through the use of extensive rubato. This listening exercise led to a discussion of multiple topics including performance practice, perfect pitch, transposition, when to start grandchildren in lessons, and finally, the work ethic in Asian cultures resulting in a prevalence of Asians in conservatories and major competitions worldwide. Although this discussion pushed the boundaries of the initial conception of the exercise, the resulting conversation brought important underlying factors to the class' attention. It is, of course, up to the discretion of the teacher to decide how far the conversation strays, but erring on the side of entertaining their questions to some extent.

Attendance & Retention

Although adults may exhibit initial motivation, it is a teacher's responsibility to sustain and build upon that motivation. In general, adults have commitments and obligations that may interfere with their personal learning goals. We kept the YouTube channel up to date and stayed in contact with the adults who were unable to attend class to make sure they received the assignments.

We did not set a practice time requirement, as was the case with a few other music training research studies. This bolstered our participant retention because there was not a strong external pressure to practice. Instead, we did our best to motivate them to *want* to practice by incorporating relevant and intriguing musical tasks. The participants

kept a log of time spent playing the piano, listening to music, and completing assignments throughout the course. The participants spent an average of 1,444 minutes practicing at the keyboard, 240 minutes working on pencil/paper homework, and 501 minutes *actively* listening to music. We feel it is important to distinguish active listening from passive listening, as many studies include data about music listening without any mention of *how* the participants are listening to the music. Active listening does not include background music, but rather, requires listening without distraction while trying to hear how the music exhibits specific concepts. Active listening for the class at hand included listening to online performances centered on a given topic or going to a concert and listening for concepts covered in class. Importantly, participants engaged in thoughtful discussions regarding specific aspects of music (subdivisions, facial expressions, etc.) and how their heightened attention to these concepts changed their interpretation.

Myth: Simple = boring

When working with adult beginners, it is tempting to rush through the fundamentals because they seem 'simple' and therefore boring. A positive aspect of working with adult learners is that they easily understand the face value of concepts. For example, note values are easily comprehended since the learners understand the essence of time and steady beat, but as one learner put it, 'It's one thing to see it. It's another thing to hear it.' The simplicity of concepts, such as note values, taught from a theoretical stance becomes captivating when a teacher also incorporates listening, imitating, creating, and playing the visual representations of note values. The ensuing portion of this section exemplifies activities used to explore and bring the basic elements of music to life.

Figures 3 and 4 show the products of a rhythm composition task where the learners thought of English words where the accentuation of syllables aligned with the natural stress of the rhythm group. This exercise led to a discussion of strong and weak beats where Rome, London, and Copenhagen are examples of proper accentuation for quarter, eighth, and sixteenth notes, respectively. Single syllable words never presented a challenge as there is no strong/weak relationship, but their choice of words for the sixteenth-note values proved to be more challenging. At times, four-syllable words pose a problem because the accentuation can fall on different syllables. For example, exotic sports car manufacturers *Maserati* and *Lamborghini* have emphases on the third syllable, whereas a group of four sixteenth notes have an implied emphasis on the first syllable unless otherwise notated. We demonstrated how *Maserati* could be notated to fit the natural accentuation of a group of sixteenth notes as shown in Figure 5. By having two sixteenth notes as an *anacrusis*, another term in their vocabulary at this point, the third

syllable emphases align with the appropriate accentuation. Taking a semiotic approach to rhythm fundamentals allows for discussions regarding musical phrasing and interpretation that adults easily connect with.
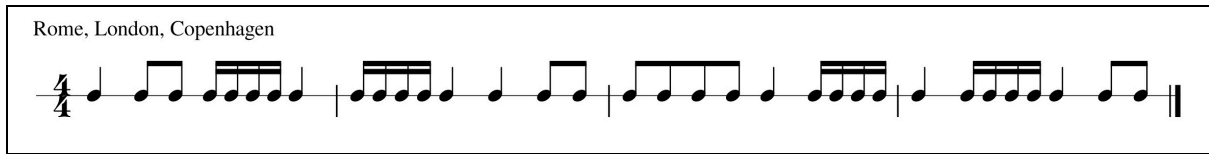
Figure 3: Proper accentuation

Figure 4: Improper accentuation

Figure 5: Proper accentuation

Figure 6 is a simple copying exercise that required reproducing everything from an excerpt written on the grand staff. This task may seem elementary, but the adults mentioned how much notation detail they gleaned from the exercise. This copying exercise is from the open access supplemental web materials of *Piano For Pleasure* by Lynn Freeman Olson and Martha Hilley (www.pfppiano.org).[3]
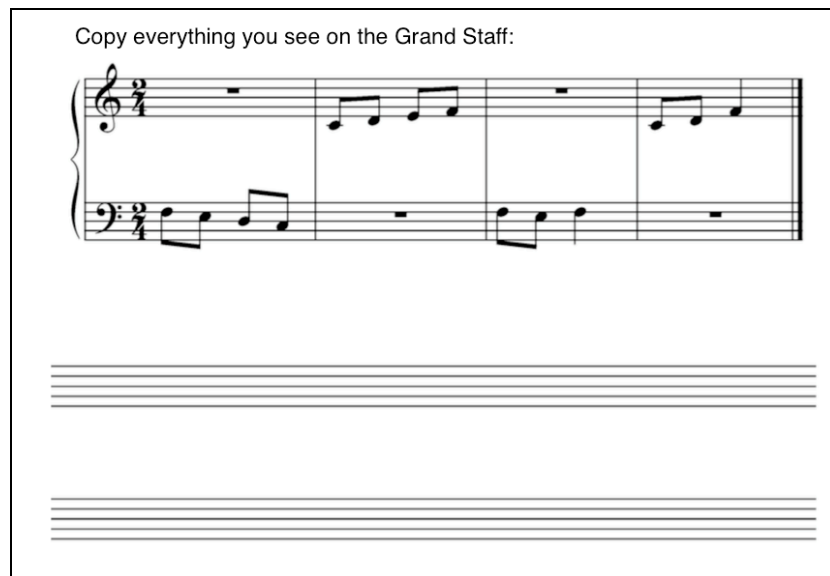
Figure 6: Imitation

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[3] Each participant was provided with a copy of *Piano For Pleasure, 4th Edition Concise.*

Figures 7 through 9 are examples that asked the learners to notate a familiar tune using newly acquired knowledge. We implemented this progressively— Figure 7 only involves pitch, while Figures 8 and 9 involve pitch, rhythm, and meter. Figure 9 also adds a layer of complexity to the exercise in Figure 8 by requiring the students to transpose the melody to the key of D Major. Since the melody only contains stepwise motion, the adults applied their knowledge of whole steps and half steps to complete the task. After transposing the melody to the original key of D Major, they played along with an orchestral recording.

Figure 7: Keyboard and staff exploration via aural skills
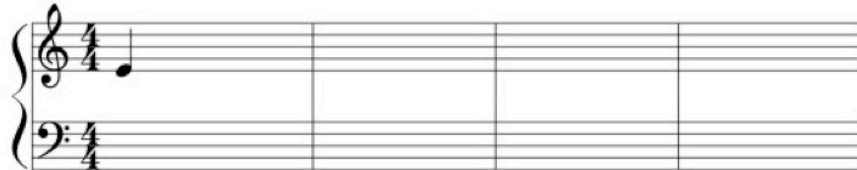
Figure 8: Keyboard and staff exploration via aural skills with meter
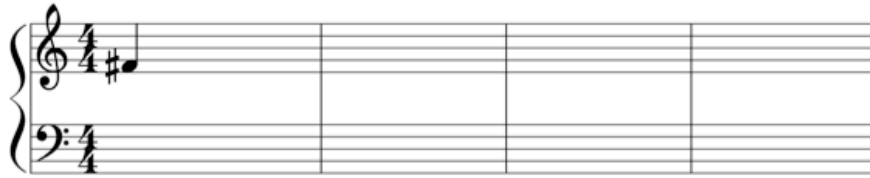
Figure 9: Transposition with whole steps and half steps

As newcomers to music gain familiarity with the basics, exploring simple concepts in advanced musical examples lead to a deeper appreciation of the salient features of music that permeate the musical landscape.

It is a common misconception that 'simple' means 'elementary'. In fact, musical concepts frequently labeled as 'simple' should actually be redefined as 'fundamental' because they permeate all music, not just music written as teaching material. One only needs to look at the intensely complex analyses of Heinrich Schenker to see that even the most complex music can to some extent be understood in terms of a 'fundamental structure' (*Ursatz*) or 'fundamental line' that binds an entire piece together.[4] Many of music's most important salient features are anchored in fundamentals and even complex musical relationships almost always build upon fundamentals.

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[4] Schenkerian analysis does unfortunately trivialize many important and even 'fundamental' musical features that take place on the surface, most importantly rhythm. Nonetheless, its desire to find fundamental relationships between different composers, genres, and to some extent eras, stands true.

In relation to the relevance of this point in a group piano setting, one can find examples of any musical concept, no matter how rudimentary, in advanced repertoire that is inspiring and engaging. For example, Beethoven's Piano Sonata, Op. 57, popularly known as 'Appassionata,' is an example of repertoire clearly too advanced for beginners from a pianistic and musical standpoint. Nonetheless, the opening of the first movement of this sonata introduces contrast as an important compositional device.

The class first listened to the opening section of the piece, then commented on several interesting aspects of the piece and many seemed to experience an emotional reaction to the performance prior to looking at the score. They were then shown the score and were had the opportunity to verbalize what they observed on the page (see Figure 10). By this point in the class they could correctly identify and label the meter, key signature, articulation, ties, dynamics, note values, accidentals, clefs, and rests.

After pointing out everything they recognized, they listened once more. After the second listening, they noticed the aforementioned compositional tool that had not been explicitly discussed in class, namely contrast. The learners excitedly pointed out numerous striking contrasts—dynamics, register, texture, and key—that significantly contribute to the emotional power of this opening passage. As labeled in Figure 10, Beethoven places the extremes of fundamental musical features in direct opposition of each other in rapid succession. This jarring juxtaposition of many opposites in such a short period of time is truly striking and adds to the dramatic trajectory of the opening. Figure 10 highlights these opposites with dynamics labeled in red, texture in green, key in blue, and register with purple arrows showing the direction of large registral shifts. Even with only a basic working knowledge of music, one can understand, appreciate, and ultimately feel the emotional impact of the interaction of these musical features in this highly polarized opening. Gaining musical knowledge is highly valued by adults enrolled in music lessons (Jutras 2006); by focusing on features that the class already understands, they are able to have a greater emotional reaction to this passage while gaining confidence in their ability to apply their knowledge to 'real' repertoire.

**Figure 10: Juxtaposition of musical features in
Beethoven's Piano Sonata, Op. 57**

Another Beethoven work provided a perfect platform to introduce the rest, a basic musical feature. Instead of simply showing the class how to draw a rest for a corresponding note value, perhaps a teacher may let them experience the power of silence in music. Upon listening to the opening of Beethoven's *Coriolan Overture, Op. 62*, the class described it as dramatic. Soon thereafter, one adult commented on the prevalence of the pauses. Without any prompting from the instructor, the students identified two incredibly important features that interact in this opening passage. They realized that the poignant, pregnant pauses contributed significantly to the dramatic opening of this piece. This potential role of silence in music was instantly brought to life.

After listening and discussing this passage, the class viewed the score showing quarter, half, and whole rests as labeled in Figure 11.

Figure 11: Poignant pauses in Beethoven's *Coriolan Overture, Op. 62*

Myth: We can't accomplish much in short-term group classes

When teaching young students, teachers often have the luxury of teaching students for several years. There is time to develop technical skills, guide students through a variety of musical styles and interpretations, and approach many musical concepts in a methodical manner. For adults, indefinite lessons are rare due to work and family obligations, therefore, short-term lessons and classes are often more suitable. Short-term lessons can work in the favor of the instructor, since the learners are highly motivated and the experience is novel. The goals and objectives of short-term learning experiences can encompass a wide range of concepts despite the time constraints of our ten-week course. As exemplified in previous sections, the students received instruction

in a large number of musical concepts and completed a wide variety of exercises and tasks focusing on numerous skillsets. They also learned to apply new concepts to both familiar and new repertoire. In our experience, the goals of short-term music lessons need not focus much on the mastery of a single concept, but rather on a larger gestalt that speaks to the learners as appreciators of music. This is not to say that adults do not need to master skills. It is absolutely necessary for adult learners to experience mastery of small musical tasks, but the goals of these achievements are inherently different from the mastery teachers drive younger students to develop when time is available.

Much can also be accomplished even within a short time frame in terms of playing ability at the piano. After ten weeks, our participants confidently played an arrangement of *Somewhere Over the Rainbow* on the grand staff with accompanying triads in the left hand (see Figure 12). In addition to reading staff notation, they also demonstrated the concept of harmonizing the melody and chord symbol notation. The most valued comment received from our adult learners regarding their overall learning experience for the ten-week session was, 'We will never listen to music the same again.'

Figure 12: Arrangement of *Somewhere Over the Rainbow*

Myth: Lessons must be perfectly planned

Many profound moments in teaching are not laid out in the lesson plan. Lesson plans provide structure and a sense of direction, but can close off potential teachable moments if adhered to too rigidly. Teachers experience times where being inventive came in handy during a private lesson, and the ability to field questions and adapt content in the moment can be an immense asset in group teaching situations. Being willing to be creative while not being afraid to stray from the lesson plan is key to engaging learners. Having a variety of ways to explain a concept necessitates a deep understanding of the material from the instructor, but a teacher's ability to be flexible by implementing and allowing for tangential discussions proves equally valuable as previously discussed.

Sometimes a clearly thought out plan may need to be amended, reconsidered, or completely dropped. There was an instance early on in the course where the majority of the learners struggled with a hand crossover in an arrangement of *Amazing Grace.* We did not foresee the technical challenge that this presented; although we tried various ways to work through this obstacle, it was simply taking more time than it was worth, thus we made the decision to move on. This was the right decision for our class at the time since the time invested trying to master the crossover led to unnecessary frustration. Sticking with something simply because it was on the lesson plan can be detrimental to the progress and motivation levels of the class, however a shift in focus may be what the learners need in the moment.

We created a rough syllabus before the outset of the class outlining several learning targets, but chose not to provide a copy for the learners. This allowed for flexibility in content without making the learners feel like they did not accomplish the learning targets. We wanted to encourage an organic progression of the content based on the learners' responses and interests. Our learners led us to constantly reevaluate which concepts to introduce in the following classes. Rigid adherence to a detailed lesson plan for the entire ten weeks would severely limit the quality, scope, and content of the course. We did not want their learning journey to be one that felt 'academic' and the intentional flexibility decided upon before starting the classes proved to be an invaluable decision. When aspects of the learning environment are too reminiscent of formal education systems, adult learners may revert to their childhood days of being a dependent learner rather than investing in being a self-directing learner (Knowles, Holton, & Swanson 2015).

Adult learners voiced the importance of clarity in the lesson objectives to provide a 'straightforward, comprehensible learning experience (Duay & Bryan 2008, p. 1076).' Although we did not always stick to the lesson plans, we voiced our objectives for the day and/or week and made sure to provide clear content and objectives. At the beginning of each week, we handed out a recap sheet from the previous week to clarify and review our discussions (see Figure 13). The customized recap sheets helped organize the various activities and concepts covered in each class. Many undefined terms in the lesson plan arose in class so it was important to make sure that we did not forget the terms introduced from our discussions. We created recap sheets for the first seven weeks of the course, but did not find them necessary for the final three weeks since they focused on exploring previously covered content in different contexts. See Appendix 1 for the complete set of recap sheets.

Figure 13: Example of recap sheet

To summarize, flexibility of classes within the framework of intentional, well-planned content leads to classes that are organic, engaging, and thought provoking. Emphasizing the *how* and *why* over the *what* is highly effective when working with adult learners.

Truth: Learning can be uncomfortable

Playing an instrument involves acquiring subject knowledge, improving skill, and applying creativity, all of which positively affect self-esteem in adult learners (Kruse 2012). However, empowerment also comes with moments of frustration. The adult learners in the Taylor and Hallam (2008) study faced challenges associated with reading music, practicing, and meeting their own expectations. These challenges are not specific to amateurs as professional musicians also suffer from moments of extreme frustration. As a teacher, expressing that professionals, including ourselves, are also sometimes susceptible to overwhelming frustration can emphasize the similarities of music making at all levels.

As teachers of adult learners, it is important to keep in mind that while many adults have had some music education, there are also adult learners who have zero prior experience

with music making. A participant who was a career educator, emphasized, '...every person who's going to be a teacher needs to go into a classroom where they know *nothing*. Not just the skill, but it is the understanding of what that's like when you have no knowledge base. And I think as teachers, we should all experience that in our lives.' Her point is well founded since having empathy towards the challenges and discomfort learners may experience during the learning process can promote a learning environment that welcomes mistakes and celebrates breakthroughs.

Truth: Being organized, passionate, and genuine goes a long way

A participant commented on the importance of organized and dependable instructors since that has not always been the case for her. A teacher that follows through contributes to the building of respect and trust. She asserts, '...[make] us feel like we [are] on your minds.' It is important to remember that adults are there by choice and a teachers' contribution affects the learning experience.

In addition, another participant feels engaged by teachers who are genuine. He said, 'If y'all had faked one of those things [enthusiasm and genuineness], it's not going to work...it's not going to work.' He directs to teachers, 'Whoever you are...if you are teaching it, you better be genuine.' A fellow learner chimes in 'Don't edit that out!,' which was followed by laughter among the group. Being genuine with our group of learners plus our shared enthusiasm for music learning made us all give 110% to the learning and teaching experience.

Truth: Working with adults is fulfilling

Ruby: I am passionate about adult music education. An opportunity to teach a group piano class for adults presented itself several years ago and the experience led me to explore this area of pedagogy. The adults I work with eagerly and readily provided feedback and we openly conversed about their goals and needs. One of the primary reasons I enjoy working with adult learners is because their candor challenges my thinking and teaching. Also, the opportunity to build friendships is endearing. Adult learners' passion for music and dedication to lifelong learning makes the challenges we face as educators (and learners!) absolutely worthwhile.

Kirsten: This project has been a long time in the making. Receiving the grant from the National Institutes of Health was my last opportunity to solidify funding for myself during my graduate career (without having to completely change the project topic). I had long wanted to use the quantitative skills I was developing in my PhD in order to test the effect of music playing on some kind of cognitive/perceptual skill. More specifically, I wanted to test the extent to which music playing could *improve* some kind of cognitive

or perceptual skill. Although my research lines meandered a bit, I found I really enjoyed working with the senior population. As I started to understand the aging and cognition literature, I learned that a lot of the cognitive skills that typically decline with age are what musicians showed enhancements in. The prospect of using music training to improve speech-in-noise perception, which has both cognitive and perceptual underpinnings, was very exciting to me. I was going to use music to help the ageing population hear better. The more I dug, the more it seemed plausible from several research perspectives. The fields of cognitive and perceptual aging, brain training, music learning, social opportunities and engagement in the ageing population, all seemed to suggest that group piano lessons might improve hearing-in-noise and potentially quality of life for seniors as well. I couldn't be more pleased with the outcome of the study - even in its currently incomplete state. The music making we did in the course was a remarkable experience for myself personally and professionally, and I am so thankful to have the opportunity to call it 'work.'

Josh: Prior to my doctoral studies a The University of Texas at Austin, I hadn't really had much experience teaching piano in group settings. After receiving an assistantship to teach group piano to music majors, it didn't take long for me to see how fun and rewarding teaching this type of class could be. Due to my love of teaching piano for several years at UT, I was very excited to be working on this project with Kirsten and Ruby. However, the incredible impact this experience had on my life, both personally and professionally, far exceeded all of my expectations. Working with the older adults in the class proved to be one of the most rewarding endeavors in my life. I really enjoyed being able to share my love for music with these learners as they were so eager to learn and willing to engage in all the activities we tried in class. There were many moments in this class where I finally felt my musical training was having a meaningful impact on people's lives. As an educator, I am well aware of the challenges of teaching in almost any context, and therefore I know how rare it is to feel what you are doing is really making a difference. I cannot overemphasize how amazing these adults were to teach and how much I benefitted from the experience. As a result of being involved with this class, I am working on starting several adult group piano classes in the Austin area to provide opportunities for other community members.

Truth: We control our teaching potential

Perhaps you have no experience teaching adults. Perhaps you are having trouble finding adult clientele. Perhaps you have had a negative experience teaching an adult or group class. Perhaps you do not have the space for group classes. This list could be endless if one allows negativity to take over. In *The Art of Possibility,* authors Rosamund Stone

Zander and Benjamin Zander, conductor of the Boston Philharmonic Orchestra, challenge one to consider the following two questions in order to bring new opportunities and potential into view:

> What assumption am I making,
> That I'm not aware I'm making,
> That gives me what I see?
>
> What might I now invent,
> That I haven't yet invented,
> That would give me other choices? (p. 15)

Our assumptions, whether it is about our students or our own skills, can hinder our growth as musicians and teachers. Instead, being cognitive of potential growth as a teacher expands teaching horizons. As one participant put it, 'Let other old people have fun with [group piano] and learn to feel good about themselves along the way.'

RESEARCH STUDY DESCRIPTION

The ten-week group piano course discussed above served as one of two interventions of a study experimentally testing how age-related declines in speech-in-noise processing could be mitigated. Age-related declines in auditory functions lead to difficulty understanding speech in adverse listening conditions, which may contribute to social isolation, anxiety, depression, and diminished quality of life. The purpose of this speech-in-noise processing research is to better understand how to use training methods to not only attenuate the age-related decline in speech-in-noise processing, but also provide older adults with a long-term and sustainable tool for healthy ageing.

Prior studies have implemented piano lessons to test its effects on cognitive skills such as executive functioning, working memory, processing speed, cognitive control, verbal fluency, verbal working memory, nonverbal memory recall, and visuomotor speed (Bugos et al. 2007; Bugos 2010; Bugos 2012). Our music training intervention was partially modeled after Bugos' studies, but the lack of detailed reports of the music training in scientific research publications inspired us to complete this manuscript.

Theoretical Background

Speech-in-noise processing refers to our ability to perceive speech in the presence of background noise. In the speech sciences, typically two types of noise are studied: energetic noise and informational noise. Energetic noise masking occurs when the noise spectro-temporally overlaps with the speech signal and is primarily occurring at the level of the ear. Construction sites and airplane noise are examples of energetic noise.

Informational noise masking occurs when the noise masks the speech signal beyond the spectro-temporal overlap and primarily occurs at the level of the brainstem, auditory cortex, and associated cognitive regions. A noisy and competing talker at a table nearby at a restaurant is an example of informational noise masking.

Research implicates several cognitive processes to be involved in speech-in-noise perception, specifically, auditory working memory (Anderson et al. 2013; Parbery-Clark et al. 2011; Akeroyd 2008), auditory attention (Strait & Kraus 2011; Strait et al. 2010), and processing speed (Akeroyd 2008; Pichora-Fuller 2003). In addition, perceptual processes such as temporal processing, gap detection, and frequency discrimination (Anderson, White-Schwoch, Parbery-Clark, & Kraus 2013; Pichora-Fuller 2003; Jin, Liu, & Sladen 2014) have been found to be involved in speech-in-noise processing. Interestingly, working memory is implicated more in informational than energetic noise conditions (Koelewijn et al. 2012; Zekveld et al. 2012; Xie et al. 2015; Wong et al. 2009). Magnetic resonance imaging studies suggest that older adults rely more on executive function-related brain regions, such as the prefrontal cortex, the fronto-parietal network and the cingulo-opercular network, and less on primary auditory cortex regions relative to young adults during speech-in-noise processing (Wong et al. 2009; Vaden et al. 2015). This suggests that older adults recruit cognitive processes to compensate for their diminished auditory perception ability.

A separate theoretical framework provides a basis for us to examine the extent to which different training activities may influence speech-in-noise processing in older adults. Park et al. suggest that productive engagement in an activity that results in learning a novel skill and does not rely on previous knowledge, will produce greater cognitive gains than receptive engagement in an activity that builds upon existing skills or knowledge (Park et al. 2014; Park et al. 2007). One example of productive engagement is playing music. Music making is a rich, multimodal experience that requires cognitive processes such as remembering the notes you just played, and planning for the next measure to achieve an intended sound. All of these processes interact and ultimately result in a rewarding skill. Due to the productive nature of music making, and the inherent cognitive abilities involved in music making, it is likely that music training would provide cognitive benefits for adults without previous formal music training.

Participants & Task Procedures

Participants were recruited separately for the two interventions. Thirteen music training participants were recruited from the Osher Lifelong Learning Institute at The University of Texas at Austin as well as the greater Austin communities using flyers, email blasts, and web advertisements. Participants completed an online screening questionnaire,

spoke with a researcher over the phone or email regarding the commitments of the project, and then were scheduled for three days of baseline measurements before the music classes began. The inclusion criterions were: 1) fewer than three years of cumulative formal music lessons in their lifetime; 2) had never played a computerized cognitive training game before for more than a total of five hours; 3) monolingual, with less than two years of experience with a language other than English; 4) no known neurological disorders; 5) have normal hearing or be experiencing age-related hearing loss. Table 2 summarizes demographic and music experience data of the music training participants.

Table 2: Participant demographic and music experience information

Participant	Age	Sex	Years of Playing (formal)	Years of Playing (informal)	Age Began	Context	Instrument	Current Hours Play	Proficiency (1: very low, 10: perfect)
1	68	F	0	10	47	Church Choir	Voice	0	3
2	60	M	0	0				0	
3	69	F	0	6	11	Band	Flute	0	1
4	70	F	0	0				0	
5	69	F	3	0	9	Solo	Piano	0	1
6	70	F	0	5	12	Band	Clarinet	0	1
7	73	F	2	0	6	Solo	Piano	0	1
8	63	F	0	2	11	Band	Clarinet	0	1
9	67	F	1	0	15	Solo	Guitar	0	1
10	66	M	1	0	8	Solo	Piano	0	1
11	60	F	1	0	12	Solo	Piano	0	2
12	71	F	0	0				0	
13	69	M	0	5	13	Band	Trumpet	0	1

During the three days of baseline measurement testing, our main outcome of interest was participants' speech-in-noise perception ability. For this task, participants were seated at a computer in a well-controlled testing room and presented with sentences through Sennheiser HD 280 Pro headphones with various types of background noise: 1) one-talker babble; 2) two-talker babble; 3) eight-talker babble; 4) speech-shaped noise (similar to white noise). Participants were instructed that the target sentence they should attend to would be presented a half second after the noise began. After presentation of the target sentence-in-noise, participants were asked to type back the

target sentence they heard. Participants' responses were hand scored off-line, and recorded as accuracies for each noise condition. While the sentence is being played through headphones, the participant viewed a fixation cross in the middle of the screen. Next, participants were required to type what they heard on the next screen. This procedure was repeated for 64 trials.

Participants in the comparison condition (ongoing as of August 2017) are completing ten weeks of LACE (Listening and Communication Enhancement) computerized hearing training. These participants completed the same tests as the music training group during the three baseline measurement days. Participants then complete the LACE training from a computer in their own home. The computerized hearing training mostly involves listening to a sentence and making a judgment about what is heard. Results of the LACE training and music training conditions on speech-in-noise processing will be available upon the publication of Kirsten's dissertation.

SUMMARY

The expansive literature on age-related decline in hearing-in-noise implicates music training as a viable training tool. Speech-in-noise perception requires the use of cognitive skills such as working memory, attention, and processing speed; and perceptual skills such as temporal and frequency discrimination. Research suggests that musicians show an enhancement in deciphering speech in the context of background in children, adults, and senior adults. Importantly, this is the first study to experimentally test the effect of group piano lessons on older adult speech-in-noise processing. The ability to hear in difficult listening environments is critical to daily life, and a reduction in that ability could lead to health issues such as depression, social isolation, and lowered quality of life. Therefore, it is imperative to test methods to alleviate the age-related decline in speech perception. Importantly, a recent consensus was published by leading academic researchers in the brain-training field describing the limitations of computer-based cognitive training. Rather, the authors recommend that healthy cognitive functioning can be attained by leading 'physically active, intellectually challenging, and socially engaged lives…' (*A Consensus on the Brain Training Industry from the Scientific Community* 2014).

It is evident from over a decade of research that music making can provide an inexpensive and ecologically valid tool to improve well-being and increase social opportunities for the ageing population. Interdisciplinary research can create a synergy that could prove to be a crucial step in helping policy-makers enact direct application of advancements in science, health interventions, and arts education (Chapline & Johnson

2016). The interdisciplinary nature of this project was rewarding, exciting, and also led to the exploration of relationships that could not have otherwise been studied.

In addition to the potential benefits of music making on speech-in-noise processing and cognitive function, music making itself is a joyous activity that is worth doing for the sake of making music. The ageing population needs entrepreneurial music educators to create more learning and music making opportunities for beginner older adults and returnees. All music educators have much to offer adult learners and can impact the lives of the people in the community by promoting healthy ageing through music making. We can be the catalyst behind creating more appreciators of music and inspire the community to gather at concert halls, house concerts, and other creative performance spaces. We hope that the details provided in this paper serve as a helpful framework for those wanting to use group piano lessons for scientific research purposes or for educators looking to create music making opportunities for adult learners.

Looking For More?

The full 60-minute group interview with the participants, our lesson videos, and listening playlist is available for viewing on our YouTube Channel:

www.youtube.com/channel/UCIvB-zje6n5bA73Ls7cXvtA

Interviews with Kirsten Smayda

- The Benefits of Learning to Play Music Even As We Get Older
  http://www.kmfa.org/episodes/2342-the-benefits-of-learning-to-play-music-
  even-as-we-get-older [June 25, 2017]
- Music and the Aging Brain: New Research at UT-Austin Tests Cognitive Benefits of
  Music in Older Adults http://www.kmfa.org/pages/746-music-and-the-aging-
  brain-new-research-at-ut-austin-tests-cognitive-benefits-of-music-in-older-adults
  [September 29, 2015]

Recommended Readings

- *The Adult Learner: The Definitive Classic in Adult Education and Human Resource Development,* by Malcolm Knowles, Elwood F. Holton III, and Richard A. Swanson (2015)
- *Intelligent Music Teaching: Essays on the Core Principles of Effective Instruction*, by Robert A. Duke (2005)
- *Music for Life: Music Participation and Quality of Life of Senior Citizens,* by C. Victor Fung and Lisa J. Lehmberg (2016)

APPENDIX 1: WEEKLY RECAP HANDOUTS

<div style="border:1px solid">

UT Hearing Training Music Lessons
Week 1: January 23, 25, 27

Sitting & Hand Position
- Arms length away from the back of the keyboard to give your arms and elbows room to move up and down the keyboard
- Sit on front half of the bench for a better center of gravity
- Our hands are the *perfect* shape for piano playing-- fingers naturally curve!
- Keep wrist level and above the keyboard, which should occur naturally if you are on your fingertips and no joints are collapsing

Fingering
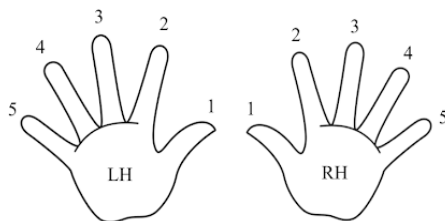
- When saying finger numbers, we label left to right/ low to high sounds/ bottom to top

Music Alphabet
- A B C D E F G A B C D E F G
- The lowest A on an 88 key piano is A1; Middle C is C4

Conducting Patterns
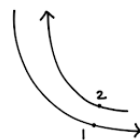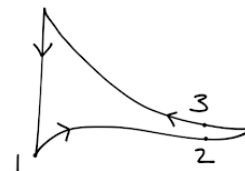
Duple (strong, weak)   Triple (strong, weak, weak)

- Examples of duple meter: Bach Prelude in C Major WTC I, Bach Prelude in C Minor WTC II: both of these are duple on all hierarchical levels! Marches, a vast majority of popular music

- Examples of triple meter: Amazing Grace, Menuets, Sarabandes, Chaconnes, Passacaglias

- Sometimes pieces may be heard as duple AND triple because the pulse and rhythm can be subdivided

</div>

Rhythm
- Note values are hierarchical

Whole note = 4 beats

Half note = 2 beats

Quarter note = 1 beat

8th note = 1/2 beat

(16th note = 1/4 beat)
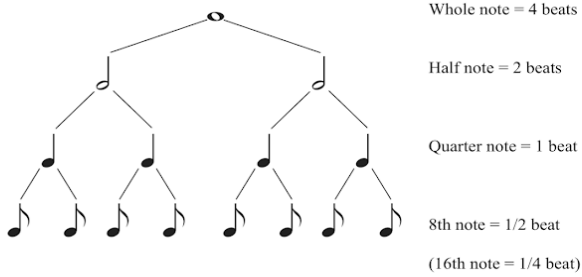
- Two 8th notes are written together as:

- Four 8th notes are written together as:

- Two 16th notes are written together as:

- Four 16th notes are written together as:

- Notice the number of bars connecting the notes together-- that is what differentiates an 8th note from a 16th note!
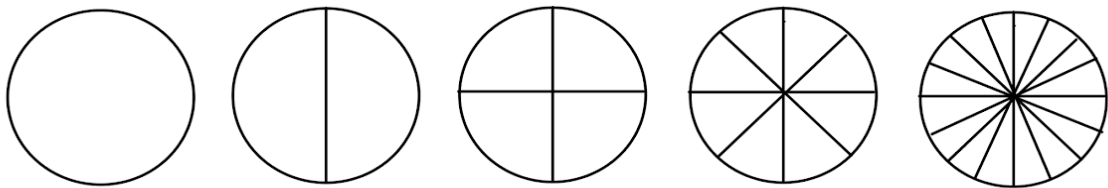
Harp Song

LH	RH	LH	RH

C E G / C E G / C E G / C E G

F A C / F A C / F A C / F A C

G B D / G B D / G B D / G B D

C E G / C E G / C E G / C E G + any C on the keyboard to end the piece

Terminology
Pentascale: 5 consecutive notes (e.g. C D E F G)
Scale: 8 consecutive notes (e.g. C D E F G A B C)

Upbeat, pick up, anacrusis: when a piece starts with the last beat (or two) of a measure. The incomplete measure will usually be completed at the end of the piece.
Downbeat: the first beat of each measure
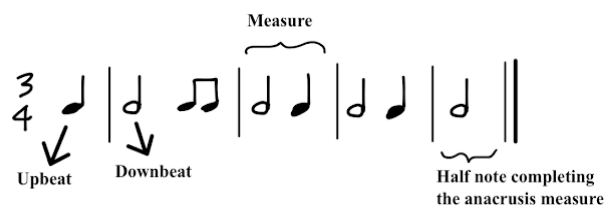
Time signature is synonymous with meter

Crescendo: gradually getting louder
Decrescendo: gradually getting softer

Major: sounds easy going, complete, bright, happy
Minor: sounds ominous, foreboding

Metronome: The metronome number settings refers to beats per minute (bpm). Practicing with the metronome will tell you whether your pulse and rhythm is steady. Switch back and forth between metronome use. Ultimately, the goal is for you to internalize the beat and not have to rely on a metronome to keep you steady since that can also lead to you sounding unmusical and robotic. Amazing Grace= ~72.

Harp Song
- The keyboard provided to you has a range of C1 to C6. This means in order to have enough keys to complete the pattern of Harp Song, start on C2, move down to F1, move to G1, and then back to C2. On a full size keyboard, you have more options as to where to start.
- Practice tip: focus on the change from C to F and F to G. Start moving your LH down as your RH is still playing for a smooth sounding transition.

Listening (Examples of Duple Meter)
- Prelude in C Major from WTC 1 by J.S. Bach
- Prelude in C minor from WTC 1 by J.S. Bach

J.S. Bach (1685-1750) composed two books of 24 Preludes and Fugues, one in each key, titled *The Well-Tempered Clavier* (WTC). Composed "for the profit and use of musical youth desirous of learning, and especially for the pastime of those already skilled in this study," the WTC is one of the most influential compositions in Western music. Nicknamed "the foundation of all music" by the famous cellist Pablo Casals, both Mozart and Beethoven studied these pieces in great detail. Even though written for instruments very different from our modern piano, several famous pianists in the 20th century have recorded all 48: Angela Hewitt, Glenn Gould, Friedrich Gulda, Jenö Jando, Sviatoslav Richter, Rosalyn Tureck, and Andras Schiff to name a few. There are also recordings of WTC on the harpsichord (Wanda Landowska, Pierre Hantai, Richard Egarr, Andreas Staier).

UT Hearing Training Music Lessons
Week 3: February 6, 8, 10

Reading music!
PFP p. 26
- Notes are either on a line or a space
- Line → space / space → line = step to next letter name
- Line → line / space → space = skip to next letter name

Grand Staff & Relationship of Keyboard to Grand Staff
PFP p. 41-42

Landmark Notes
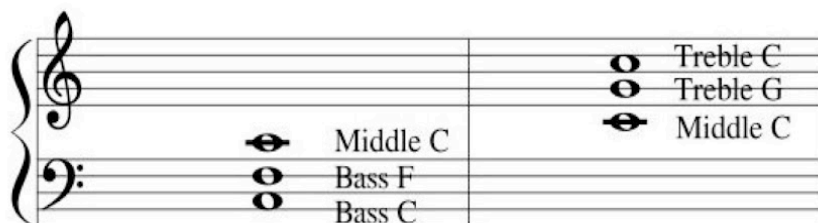
- Knowing landmark notes will allow you to efficiently figure out any other note on the staff! Remember that each line and space represents a letter name on the keyboard.
- The grand staff has 11 lines: the line which middle C sits on is "invisible" unless the note is used. In that case, a ledger line is used to represent the line. Ledger lines are used to represent notes above the treble clef and below the bass clef.
- Bass C= C3   Middle C= C4   Treble C= C5

Reading practice covered in class
PFP p. 47-49

Extra grand staff reading practice
PFP p. 42-43

Dynamics
Everything we hear is dynamic-- music has the ability to affect us because of the combination of notes and dynamics. Dynamics are relative especially with crescendos and decrescendos.

pp = pianissimo, very quiet
p = piano, quiet
mp = mezzo piano
mf = mezzo forte

f = forte, loud

ff = fortissimo, very loud

crescendo/ cresc. = gradually getting louder

decrescendo/ decresc. / diminuendo/ dim. = gradually getting softer

Articulation

Musical notes can be used to express different characters through the way we play the keys such as excited (staccato) or peaceful (legato).

Legato: when _different_ notes are connected by a curved line (known as a slur), it means to play all the notes in a connected, smooth manner. Think about transferring the weight from one finger to the next like rolling dough.

Staccato: when a note has a dot above or below, it means to play the note in a short, detached manner.

Tie: when the _same_ note is connected by a curved line, the second note is held for its value and not played. Ties are used within the measure *and* across measures.

Rhythm
- 16th notes are usually counted as "1 e & a, 2 e & a" to represent each note with a syllable-- we've been associating 16th notes with words that have a strong beat on the first syllable such as watermelon, Copenhagen, dandelion

Practice Tip
- Repetition of small sections is the most effective way for your brain and fingers to learn!
  - Play 2 measures + downbeat of next measure
  - Play next 2 measures + downbeat of next measure
  - Play all 4 of those measures + downbeat of next measure

What do you listen to in music?
- Lyrics
- Melody
- Bass line

Bass Line of *My Girl* by the Temptations

G G | C C | G G | C C |	I've got sunshine on a cloudy day
G G | C C | G G | C C |	When it's cold outside I've got the month of May.
G A | C D | G G A A | C C D |	I guess you'd say What can make me feel this way?
G G | G G | C C | G ‖	My girl (my girl, my girl) Talkin' 'bout my girl.

* *My Girl* is in 4/4 and starts with an upbeat of "I've got" therefore the first note of the bass line begins on "sunshine"

The 4 Chord Song
- Many, many pop songs are based on 4 chords. They are:

$$E \quad \downarrow B \quad \uparrow C\# \quad \downarrow A$$

- Use your left hand 1 to play the E.
- Which finger would play the A?
- Be sure to prepare to play the C# with your third finger.

*YouTube: The Four Chord Song by Axis of Awesome demonstrates how many songs use this chord progression!
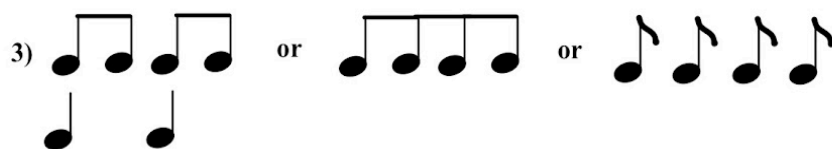
Explore The Keyboard
- Explore the keyboard by trying to figure the tune to Happy Birthday starting on a G.
- What if you started on another note? Like D?
- Try picking out other tunes by ear!
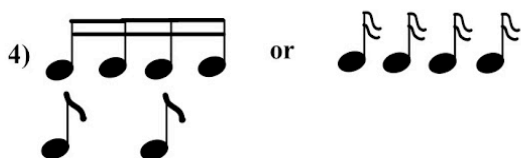
Examples of Note Value Relationships and Subdivisions
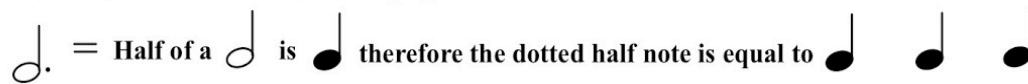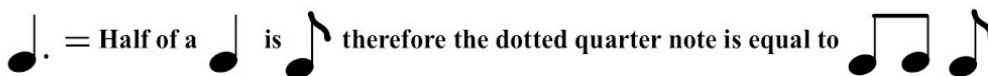
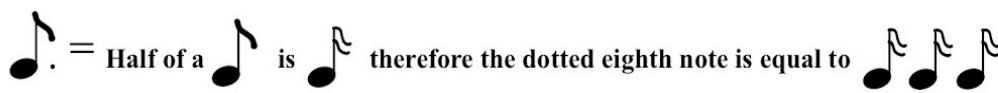**Dotted Rhythms**
*The dot adds half of the note it is modifying

therefore the dotted half note is equal to

therefore the dotted quarter note is equal to

(Ode to Joy)

therefore the dotted eighth note is equal to

(Happy Birthday/ Jingle Bells)

Dotted rhythms are often found like this:

or triple subdivision:

Practice Tip for the Axis of Awesome Bassline: E   ↓B   ↑C#   ↓A

Say finger numbers

> "1--- go to 4, 4--- go to 3, 3--- go to 5, 5--- go to 1"

Rhythm you are chanting:

Say letter names

> "E--- go to B, B--- go to C#, C#--- go to A, A--- go to E"

Rhythm you are chanting:

Listening Examples (6/8 or duple with triple subdivision)
- Elvis- Can't Help Falling in Love (https://youtu.be/vGJTaP6anOU)
- Righteous Brothers- Unchained Melody (https://youtu.be/ZoEwR9_Sy_M)
- Schubert- Ave Maria (https://youtu.be/pwp1CH5R-w4)
- Strauss- Beautiful Blue Danube (https://youtu.be/IDaJ7rFg66A)
- Mozart- Piano Sonata No. 11 in A major, K. 331 - I. Andante grazioso (https://youtu.be/dP9KWQ8hAYk)

Music Terminology

Intervals: the distance between notes on the staff. Include the note you're on and the note you're going to.

> 2nds: C--D, D--E, E--F
> 3rds: C--E, D--F, E--G
> 4ths: C--F, D--G, E--A

Accelerando: to get faster
Ritardando: to get slower
Rubato: the give and take of time in performance for expressive purposes

Terminology: For all of these terms, simply do a google search to see more in depth explanations of their use and historical significance!

Rests: Every note (eighth, quarter, half, whole, dotted notes) has a corresponding rest as shown on page 6 of the *Fundamentals of Piano Theory*. A whole rest is a "chameleon" that can function as an entire measure of rest in 2/4, 3/4, 6/8, etc. in addition to functioning as 4 beats of rest. Listen to the *Adagio for Strings* by Samuel Barber and the beginning of Beethoven's *Coriolan Overture* for some dramatic rests!

How to 'professionally' draw a quarter rest. (MUCH better than mine!)
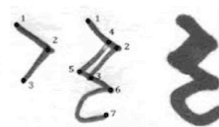
Accent: An accent indicates that an emphasis should be placed on the note it is above.

Leger lines: Lines above and below the staff to extend the range of notes. Refer to pages 4-5 of the *Fundamentals of Piano Theory*.

Syncopation: An accentuation or emphasis on the weak part of a beat, measure, instead of the expected strong beats.

Fermata: "I am a fermata, hold me!" Fermata indicates that you should hold the note or rest longer that its normal duration.

Musical Periodicity: For music, this terms is most commonly associated with the enormous body of music, both classical and popular, that is organized into groups of four measures at a time. This is very much a perceptible phenomena if you listen for it!

Canon: A form of musical imitation where another singer or instrumentalist 'steals' a musical idea from another instrument while the other instrument/singer continues like Row, Row, Row Your Boat and Canon in D. There is LOTS of info on Wikipedia for this musical term--you can see how a single musical term can be quite complex and varied!

How can rests contribute to the dramatic trajectory or emotional content of a piece?
- Beethoven's Coriolan Overture: Poignant, dramatic silences permeate the opening passages and punctuate the musical discourse while enhancing the dramatic unfolding of the piece. This contrasts the smooth, peaceful melodic passage that follows. This more lyrical passage also contrasts the darker minor key area of the opening with a brighter major key.

Contrast is a vital part of many musical works.
- Beethoven's Piano Sonata Op. 57 "Appassionata" 1st mvmt.: Contrast in dynamics, register (high vs. low), texture (sparse vs. dense), key (Major, Minor).

Transpose or transposition: To move musical content up or down while maintaining the intervallic content. C-D-E-F-G = D-E-F#-G-A = E-F#-G#-A-B = F-G-A-Bb-C = Db-Eb-F-Gb-Ab. The intervallic content of this set of notes is keynote, then whole step, whole step, half step, whole step.
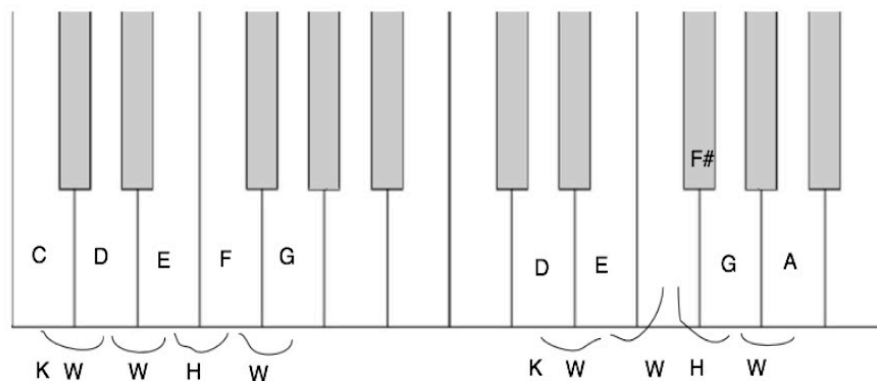
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