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Determining Musical Preferences in Persons with Dementia: Comparing Caregiver  
Opinions to Stimulus Preference Assessment

By  
Eva C. Iglar

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree  
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Determining Musical Preferences in Persons with Dementia: Comparing Caregiver  
Opinion to Stimulus Preference Assessment

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This thesis paper has been examined and approved by the following members of the  
thesis committee.

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### Abstract

The music therapy literature supports the use of individualized music in order to reduce problem behaviors among individuals with moderate to severe dementia; however, these interventions frequently rely on family members and/or staff to choose preferred music. Family members and caregivers are often inaccurate when choosing preferred stimuli for cognitively impaired individuals. The purpose of this study was to determine if family members and caregivers could accurately identify the preferred music of individuals with dementia. A single stimulus preference assessment was used to empirically determine preferred music and then these results were compared to family member and caregiver rankings. The results indicated that family members and caregivers were inaccurate in choosing preferred music, suggesting the need for a systematic preference assessment to be added to individualized music interventions.

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## Chapter I

### Introduction

#### Dementia

Dementia is a clinical diagnosis that involves the presence of multiple cognitive deficits in those that the disease afflicts. The *Diagnostic and Statistical Manual IV-TR* requires significant memory impairment along with at least one other deficit in cognitive functioning in order for an individual to receive a diagnosis. These cognitive deficits can include executive functioning difficulties, apraxia, aphasia or agnosia. A combination of these deficits along with the decline in memory cause significant impairment in every day functioning. Although most people use “Alzheimer’s” and “dementia” as interchangeable terms, Alzheimer’s disease is only one type of dementia, albeit the most common type. Dementia has additional etiologies that range from Parkinson’s type to vascular disease (APA, 2000). Unfortunately, the medical treatment for dementia is usually in the form of secondary prevention, which involves slowing down or attempting to prevent further cognitive decline (Schulz & Fleissner, 1995).

Individuals with dementia not only experience memory and cognitive deficits but also experience difficulty in activities of daily living (ADL) at most stages of the disease. Daily living tasks such as toileting, bathing, and dressing have been identified as some of the most difficult as the disease progress (Burgener, Jirovec, Murrell & Barton, 1992). Additionally, dementia impacts the lives of family members and direct caregivers, such as certified nursing assistants (CNA) working in nursing home facilities. Individuals with dementia will eventually require full-time, specialized care, proving economically

challenging for families as well as physically and mentally draining for family members and caregivers (Schulz & Fleissner, 1995)

The prevalence of dementia continues to rise worldwide, especially in the United States as the population continues to age. A 2003 World Health Report provided disquieting statistics concerning the prevalence and economic toll of dementia. This report found that among individuals over the age of 60 with a disability, dementia is the most prevalent disability, accounting for 11.2% of the elderly disabled population. Dementia accounts for a higher percentage of disability than stroke, musculoskeletal disorders, cardiovascular disease and cancer. From 1997 to 2004, the prevalence of dementia rose from 18 million to 24 million people worldwide and the number of those affected is projected to reach 42 million in 2020 and 81 million in 2040. The cost of dementia is also increasing; an estimated \$315 billion worldwide is spent on care associated with dementia and \$210 billion worldwide as direct cost to health care. Along with the increase in the prevalence of dementia, there is a decrease in the quality of care due to the inability to provide appropriate and necessary care and an increase in caregiver strain especially because most family members who care for these individuals are inexperienced (Ferri et. al, 2005).

Among CNAs, burnout and injury are significant concerns, which lead to high employee turnover, greater mental and physical strain on caregivers and family members, and lower quality care (Buchanan, Christenson, Ostrom & Hofman, 2007; Groene, 1993). Furthermore, family members are typically dealing with personality changes that accompany other mental and physical limitations of their loved one. Usually inexperienced caregivers, family members find themselves burdened with extra



responsibilities, including having to provide and coordinate care. Family members also typically experience poor self-care, mental and physical health issues, chronic health conditions, greater use of prescription medication, social isolation, and an increase in family conflicts. Moreover, when family members experience mental and physical health problems, they do not seek timely, appropriate care for themselves (Schulz & Fleissner, 1995).

### **Behavior Problems and Dementia**

Behavioral disturbances commonly co-occur with the cognitive deficits of dementia. Although the DSM-IV-TR doesn't require behavioral disturbances to be present in order to make a diagnosis, it acknowledges that these symptoms are common. For example, Okura et al. (2010) found that 58% of individuals with dementia experienced at least one neuropsychiatric symptom, with apathy (42%) and agitation (41%) being the most common. Okura et al. (2010) also found a very high association between daily living limitations and behavioral disturbances and neuropsychiatric symptoms. Neuropsychiatric symptoms associated with dementia also increase caregiver strain and are a predictor of institutionalization (Okura et al. 2010).

As the disease progresses, behavioral disturbances typically increase, putting greater strain on caregivers, which can increase the risk of injury to nursing home residents and employees (Buchanan et al. 2007). Common symptoms associated with increased severity of dementia include pacing, irritability, anxiety, social withdrawal, hallucinations, personality changes, paranoia, increased disorientation, agitation, screaming, hitting, scratching, sleep disturbances, inappropriate disrobing, inappropriate sexual behavior and resisting care (Buhr & White, 2006; Burgener et. al, 1992).

Aggression is one particular behavioral disturbance that commonly occurs in persons with dementia as the disease progresses. Among those with dementia living in nursing homes, the literature claims that anywhere from 18-86% are labeled as aggressive (Buchanan et al. 2007). Marx, Cohen-Mansfield and Werner (1990) found that individuals labeled as aggressive typically fall into at least one or more subcategories: physically aggressive, verbally aggressive and sexually aggressive. This aggressive behavior is typically not random or unpredictable but highly associated with hands-on care tasks like bathing, toileting and dressing (Marx, Cohen-Mansfield & Werner, 1990). Many individuals with dementia also express emotional distress and uncharacteristic extreme emotional reactions during hands-on care giving tasks (Guetin et al., 2009). Aggressive behavior is also associated with longer nursing home stays, daily living tasks and adverse side effects of psychotropic medication (Marx, Cohen-Mansfield & Werner, 1990).

### **Causes and Treatment of Behavioral Disturbances**

Models used to explain the causes of behavioral disturbances fall into two general categories: the medical (biological) model and environmental (psychological) models. Each model also calls for the use of specific interventions, which are based on the presumed etiology of behavioral disturbances.

#### **The biological model:**

Because dementia is an organic disease that damages brain tissue, it is commonly presumed that aggressive and agitated behavior are caused by the disease process.

Aggressive behavior and agitation among individuals with dementia is, however, only

weakly correlated with cognitive impairments, suggesting that aggression is not entirely caused by disease progression (Burgener et al. 1992).

One implication of the biological model is that if behavioral disturbances have a medical/biological cause, then medical/biological interventions are necessary to manage those behaviors. Although the use of psychotropic medication to manage aggressive behavior and agitation for individuals with dementia is not approved by the FDA, psychotropic medication often becomes the solution to managing problem behaviors (Buchanan et al. 2007; Yury & Fisher, 2007). Major tranquilizers are often used to manage aggressive behavior but there is evidence that these tranquilizers may actually cause more future aggressive behaviors (Marx, Cohen-Mansfield & Werner, 1990). The use of antipsychotic medication may inhibit responding during non-aggressive behavior while leaving the escape-seeking or aggressive behavior intact (Yury & Fisher, 2007). The use of psychotropic medication and tranquilizers can lead to a significant increase in gait disturbances and increase fall risk (Marx, Cohen-Mansfield & Werner, 1990). Jalbert, Eaton, Miller and Lapane (2010) found a significant increase in hip fractures in individuals with dementia taking atypical antipsychotic medication, which was then associated with a higher mortality rate. Additionally, antipsychotic medications are also associated with other serious, negative side effects such as stroke, death and faster cognitive decline (Buchanan et al. 2007). Older patients may be more likely to experience side effects such as tachycardia and impaired recent memory due to an age-related decline in the ability to metabolize antipsychotic medications. When comparing Alzheimer's participants who used antipsychotic medications and those that did not, Herrison and Therrien (2007) found that participants taking antipsychotic medication

remembered significantly fewer autobiographical memories. Although both groups were similar in MMSE scores, those taking antipsychotic medication averaged only one out of five on an autobiographical memory test and those not taking antipsychotic medication averaged three out of five on the same test. Because antipsychotic medication controls positive psychiatric symptoms, such as behavioral problems, they also can affect other behavior (Harrison & Therrien, 2007). Therefore, antipsychotics can further limit language and self-care, further handicapping Alzheimer's patients (Buchanan et al. 2007).

**The psychological model:**

Psychological models generally propose that behavioral disturbances are related to their environment and are not solely a product of the disease process. For example, Marx, Cohen-Mansfield and Werner (1990) suggest that poor social interactions may lead to more aggressive behaviors and aggressive behaviors result in a perceived negative relationship by the residents with dementia. Furthermore, when residents become aggressive during daily care routines, nursing staff typically stop care briefly, thereby providing the individual escape from the adverse stimuli. Aggressive behavior can then be conceptualized as a means of escape by residents, which negatively reinforces aggression.

The negative effects of antipsychotic medication have not gone unnoticed, causing a recent increase in research regarding non-pharmacological, restraint free interventions, although this number remains small. The techniques investigated include distraction-based interventions, bright light therapy, activity-based intervention, caregiver training interventions, art therapy, movement & reminiscence therapies, memory training,

reality orientation and music therapy interventions (Buchanan et al. 2007; Grasel, Wiltfang & Kornhuber, 2003). Although a number of non-drug, restraint free therapies exist for managing aggressive and agitated behaviors, there are few studies that provide significant evidence for the effectiveness of non-pharmacological interventions relative to the large number of studies examining pharmacological interventions. Grasel, Wiltfang and Kornhuber (2003) argue that this lack of research and evidence could be due to lack of personnel training in these areas. Also, there is no commercial interest in non-pharmacological therapies, while there is a great deal of money involved in the development and commercialism of antipsychotic medications.

### **Music Therapy Interventions**

Within the broad array of non-pharmacological, restraint free interventions, several studies have documented the beneficial effects of music interventions with multiple populations, including individuals with dementia. Passive musical activities, such as simply listening to music, have shown to be effective in managing aggressive and agitated behaviors, engaging residents, regulating mood and perhaps even improving memory (Grasel, Wiltfang and Kornhuber, 2003). Sherratt, Thornton and Hatton (2004) reviewed the literature on music therapy and concluded that overall people with dementia responded positively to music. Most studies reported that music was effective in reducing a range of challenging behaviors such as aggression, agitation, wandering, repetitive vocalizations and irritability. However, the authors also found several significant differences between studies regarding operational definitions and the type of music used (Buhr & White, 2006; Sherratt, Thornton, & Hatton, 2004).

Music interventions have also been studied as a possible way to reduce problem behaviors in nursing home residents with dementia. Groene (1995) examined the difference in efficacy of using a passive music intervention versus using a reading intervention in order to reduce wandering behaviors. Participants in the music group stayed seated longer or stayed in closer proximity compared to participants in the reading group. The authors also observed a decrease in wandering from session to session in the music group. Thomas, Heitman and Alexander (1997) similarly found that soothing music played during bathing demonstrated a significant decrease in agitation and aggressive behaviors. In addition, Goddaer and Abraham (1994) used relaxing, non-individualized music during mealtime in order to reduce agitated behaviors. The authors tracked the weekly behaviors of residents and found a total reduction in agitation and a lower incidence of physically and verbally aggressive behaviors.

### **Individualized Music Interventions**

Some studies have suggested that individualized music interventions may be more effective for reducing problem behaviors than generic, non-personalized music. Gerdner, Menten and Titler (1999) define individualized music as music that has been integrated into the individual's life and is based on personal preferences. They suggest carefully selecting individualized music through interviews with family and staff. The authors also found that several studies have found that individualized music may have carry-over effects after implementation in reduction of problem behaviors and improvement of mood. Individualized music interventions have also been shown to reduce challenging behaviors, combativeness and the use of physical restraints (Gerdner, Menten & Titler, 1999; Thomas, Heitman & Alexander, 1997). Gerdner, Menten and Titler also argue that

determining preferred music and implementing a receptive intervention is practical. This non-pharmacological intervention is inexpensive and easy to implement, with no extra work needed by staff. An individualized music intervention can also be implemented over a variety of settings, from meals to daily care routines.

Individualized music interventions have also been examined in decreasing behavioral disturbances during care routines. Brotons and Pickett-Cooper (1996) implemented a music therapy session twice a week for thirty minutes each for twenty nursing home residents with a history of agitated behaviors during care. During the music therapy sessions the participants were significantly less agitated. Furthermore, after the implementation of the music therapy intervention, when observing behavior during care routines, the authors found significantly less agitation during daily care routines.

Although there is a movement in the music therapy literature to use preferred music, the majority of studies determine resident preferences by asking family members and/or caregivers. Studies involving preferred music rarely have utilized a systematic way to assess if the individualized music chosen is actually preferred by the individual.

### **Caregiver Accuracy**

The literature involving preferred stimuli with disabled children and individuals with dementia suggest that caregivers and family members are generally inaccurate when asked to rank preferred items (Pace, Ivancic, Edwards, Iwata & Pace, 1985; Mesman, Buchanan, Husfeldt & Berg, 2011). Green, Middleton, and Reid (2000) compared a person-centered preference plan that was developed by individuals who knew the participant well and a systematic preference assessment. The authors found that half of the items family members identified that the participant would dislike were actually

found to be preferred by the participant in a systematic preference assessment. These results support the importance of implementing an empirical evaluation of preference for individuals who cannot easily or accurately indicate preference. Mesman and colleagues (2011) evaluated caregiver accuracy in identification of preferred items with individuals with dementia and found similar results. The researchers compared caregiver identification and a paired stimulus preference assessment and demonstrated no significant positive correlation between caregiver ranking and the stimulus preference assessment. Therefore, if the literature suggests that caregivers and family members are often inaccurate in identifying preferred stimuli, they may also be inaccurate when choosing preferred music. This further suggests that many individualized music interventions may not actually be using preferred music.

### **Systematic Preference Assessment**

When individuals are unable to verbalize or accurately indicate preference for a stimulus or activity, a systematic preference assessment is often used. As indicated earlier, individuals with dementia often cannot accurately indicate preferences verbally, especially those with moderate to severe dementia, which impairs expressive language abilities. A systematic preference assessment represents an alternative to asking family members and caregivers about preferences. A systematic preference assessment allows the resident to continue to make choices in their lives, potentially improving quality of life. Previous research has also shown that preference assessments can be useful with individuals with developmental disabilities and with dementia (Green, Middleton & Reid, 2000; Mesman et al., 2011). Therefore, if systematic preference assessments have been



successful in identifying preference in individuals with dementia, they would potentially be successful in identifying preferred music.

There are many ways to conduct a stimulus preference assessment, but the three most common procedures described in the literature are: paired, multiple or single stimulus preference assessments. With a paired preference assessment, items are presented in pairs until all items have been paired with every other item. A multiple stimulus assessment involves presenting several items at one time. Finally, a single stimulus assessment involves presenting items individually. In all of these procedures, participants are asked to make choices about their preferences, either verbally or through other means such as pointing, touching, or smiling. Presenting stimuli one at a time in a single preference assessment is useful when it is difficult for an individual to select or differentiate one stimulus from another at a given time. When presenting music, playing two or more musical pieces at once would make it difficult to differentiate between them and could create confusion. Though most studies utilizing preference assessment use either a multiple or paired assessment, research has shown that single stimulus preference assessments provide comparable results (Hagopian, Rush, Lewin & Long, 2001). Hagopian and colleagues found that a single stimulus preference assessment actually took less time to administer than a multiple or paired preference assessment and was just as accurate in indicating preference.

### **Purpose of the Study**

Individualized music interventions have gained popularity and empirical support in the last few decades; however, it is difficult to assess if the music chosen in this research is actually preferred by individuals with dementia. Therefore, the purpose of this

study is to compare an empirical method (a single stimulus preference assessment) for identifying preferred musical stimuli in moderately to severely impaired persons with dementia to family member and caregiver report. It is hypothesized that the results of an empirical preference assessment will differ from opinions of family members and nursing facility staff. This would suggest that adding an empirical method to identify preferred music is necessary and could lead to a more individualized and effective approach in music interventions.

## **Chapter II**

### **Method**

#### **Participants**

##### **Dementia Patients**

Participants were recruited from the memory care units of two nursing home facilities. The unit directors of facilities indicated residents that may be appropriate for the study. Inclusion criteria included individuals who had a diagnosis of dementia, had a Mini-Mental Status Exam (MMSE; Folstein, Folstein & Mchugh, 1975) score of 19 or below and were unable to verbalize preference (as indicated by staff) were included in the study. The average MMSE score for the participants was 5 with a range of 2-11. This indicated that the population was in the severe range of cognitive impairment. A total of nine residents were recruited. One resident passed away before data collection began, one resident was unable to participant due to a recent broken hip, one resident had significant hearing problems and was unable to sustain attention for the required amount of time, and another resident did not meet criteria because he had the ability indicate preferences verbally. Three elderly females and two elderly males, ranging in age from 82 to 95 ( $M = 87$ ) years old participated. All participants lived in a special care unit for individuals with memory impairments.

##### **Professional Caregivers**

Professional caregivers that worked directly with each dementia resident were asked to participate. Professional caregivers were required to have worked with the resident for at least six weeks in order to insure that they had some familiarity with the participant. Caregivers were asked to complete a short survey (see Appendix A)

concerning which music pieces they believed the resident would prefer. A total of six caregivers were recruited; three caregivers completed one survey each, two caregivers completed two surveys and one caregiver completed three surveys.

### **Family Members**

Family members of the persons with dementia were asked to participate because they could be presumed to have extensive knowledge of the each individual's likes and dislikes. One family member per participant was asked to complete a short survey concerning which music pieces they believed their loved one would prefer. Three of the family members were daughters of the participants, one was the son of the participant and one was the nephew. Two family members did not return surveys to the researchers; therefore, only three out of five family surveys were completed.

### **Settings and Materials**

The music preference assessment sessions were conducted in the participants' individual rooms and attempts to eliminate distractions and noise were made. Fourteen pieces of music from seven different genres were used, these genres included: jazz, big band, classical, lounge, classic hymns, country-western and popular musicals. The music was chosen based on music that would have been popular in the mean teenage years of the participants, specifically popular music from the early to mid 1940s. As teenagers, individuals begin to form personal music preferences as they begin to identify themselves as part of a peer group rather than identifying them through their parents. Therefore, these formative years are the years they began to make independent musical choices and these tend to be prevalent throughout their lives (Tarrant, North & Hargreaves, 2000). All

music was purchased and downloaded via iTunes. See Appendix B for a complete listing of all musical pieces.

### **Procedure**

#### **Stimulus Preference Assessment**

A single stimulus (SS) preference assessment was implemented to empirically determine the participants' musical preferences. The sessions consisted of an initial two-minute observation without music playing. Then, each of the fourteen pieces of music were presented for three minutes with a two-minute break between each piece of music. Observations continued during these two-minute breaks. This two-minute interval at the beginning of the session and the breaks between each musical piece was used as a baseline/control phase, in order to observe the normal affective state of the participants. It was deemed important to observe each resident's normal emotional state when music was not playing so there was no confusion between average/typical emotional states and positive emotional states elicited by the music. This procedure helped assure that behaviors (e.g., smiling, tapping fingers) displayed while music was playing were in fact evoked by the music as opposed to being behaviors that frequently occur across contexts. There was also an attempt to keep conversation to a minimum in order to reduce positive reactions elicited by social interactions.

Throughout the sessions, observers recorded whether or not the participant displayed a positive reaction either to the music or during the baseline phase. The observations were conducted using a five-second partial-interval schedule; after five seconds of observing the resident, the observers spent five seconds recording if there was a positive reaction and indicated what the positive reaction was. Positive reactions

included: smiling, reaching or pointing to the cd-player, nodding, singing, tapping, humming, rocking to the music, or making positive statements about the music (i.e. “This is nice” or “I like this.”).

A total of three SS sessions were conducted for each participant. The music was presented by genre, with the two pieces of each genre being played consecutively. The order in which the musical genres were presented was randomized across each of the three sessions. No genre was ever presented first or last twice. Each session lasted approximately one hour and twelve minutes. After all three sessions were completed, the data was aggregated according to the total percentage of intervals in which positive reactions occurred and genres were ranked from most preferred to least preferred. One participant was unable to sit for an entire session; therefore, sessions were broken up into two separate sessions and presented on consecutive days.

Two independent observers collected reliability data during 67% of the assessments. Interobserver agreement (IOA) was calculated by dividing the number of interval agreements by the sum of agreements and disagreements and then multiplied by 100. The average IOA was 93.03% with a range of 88.54% - 97.62%.

### **Caregiver Assessment**

Certified Nursing Assistants (CNA) completed a survey that listed the seven genres of music presented in the SS assessment. CNAs were asked to rank each genre from most of least preferred based on their knowledge of that resident (1=Least enjoy, 7=Most enjoy). The survey was completed by at least two CNAs that had daily interactions with the participants. Rankings from all surveys for each participant were aggregated, resulting in a ranking of all genres from most to least preferred.

**Family Member Assessment**

Family member opinion regarding the participants' musical preferences was assessed by asking a family member for each participant to complete the same survey given to the CNAs. Upon completion of the survey, the genres were again ranked from most preferred to least preferred.

## Chapter III

### Results

The purpose of this study was to compare an empirical method to determine music preference (single stimulus preference assessment) to family member and caregiver report. The hypothesis of this study was that caregiver and family member report regarding preferred music among participants would not significantly correlate with the results of a single stimulus preference assessment. Results indicated that there were no significant correlations found in the data, between preference assessment and family member report, preference assessment and caregiver report or family report and caregiver report. See the Table 1 for a summary of this data. The following sections will provide preference assessment data as well as correlational data for each participant.

#### **Aggregate Data**

Data across all five participants were aggregated in order to determine which musical genres were preferred in this sample. Jazz (38.89%) had the highest overall observed positive affect when aggregated across participants, followed by lounge (37.78%), popular musicals (36.48%), country-western (34.07%), big band (32.78%), classical (25.74%), and classic hymns (16.85%). See Table 2 and 3 for a summary of these data.

#### **Individual Data**

**Participant SA.** The order of preferred music for SA according to the preference assessment in order from most preferred to least preferred are as follows: country-western, lounge, jazz, classical, big band, popular musicals and classic hymns. See Figure 1 for positive affect observed during each stimulus preference session and Figure 2 for



overall preference (data aggregated across all three sessions) as determined by SS preference assessment. SA's musical preference according to family, from most to least preferred, are as follows: classical, lounge, classic hymns, big band, popular musicals, country-western and jazz. According to caregivers, SA's preferences are as follows: country, classical, classic hymns, popular musicals, jazz, lounge and big band.

Using Spearman's rank-order correlation, the stimulus preference assessment and family member report were not significantly correlated,  $r(7) = -.214, p = .645$ . The preference assessment and caregiver report was also not significantly correlated,  $r(7) = .617, p = .140$ . The family member report and caregiver report was also not significantly correlated,  $r(7) = .299, p = .514$ .

**Participant CJ.** The order of preferred music for CJ according to the preference assessment, in order from most to least preferred are as follows: popular musicals, big band, lounge, country-western, jazz, classic hymns, and classical. See Figure 3 for positive affect observed during each stimulus preference session and Figure 4 for overall preference (data aggregated across all three sessions) as determined by SS preference assessment. CJ's musical preference according to family, from most to least preferred, are as follows: big band, classical, lounge, classical hymns, popular musicals, country-western and jazz. According to caregivers, CJ's preferences are as follows: popular music, classical, classical hymns, lounge, big band, country-western and jazz.

Using Spearman's rank-order correlation, the stimulus preference assessment and family member report were not significantly correlated,  $r(7) = .018, p = .969$ . The preference assessment and caregiver report was also not significantly correlated,  $r(7) =$

.092,  $p = .845$ . The family member report and caregiver report was also not significantly correlated,  $r(7) = .400$ ,  $p = .374$ .

**Participant LG.** The order of preferred music for LG according to the preference assessment, in order from most to least preferred are as follows: country-western, lounge, big band, jazz, classical, popular musicals, and classic hymns. See Figure 5 for positive affect observed during each stimulus preference session and Figure 6 for overall preference (data aggregated across all three sessions) as determined by SS preference assessment. LG's musical preference according to family, from most to least preferred, are as follows: classic hymns, classical, jazz, country-western, big band, popular musicals and lounge. According to caregivers, LG's preferences are as follows: classic hymns, lounge, popular musicals, country-western, classical, big band, and jazz.

Using Spearman's rank-order correlation, the stimulus preference assessment and family member report were not significantly correlated,  $r(7) = -.500$ ,  $p = .253$ . The preference assessment and caregiver report was also not significantly correlated,  $r(7) = -.231$ ,  $p = .618$ . The family member report and caregiver report was also not significantly correlated,  $r(7) = -.309$ ,  $p = .501$ .

**Participant EN.** The order of preferred music for EN according to the preference assessment, in order from most to least preferred are as follows: popular musicals, jazz, lounge, country-western, classic hymns, classical, and big band. See Figure 7 for positive affect observed during each stimulus preference session and Figure 8 for overall preference (data aggregated across all three sessions) as determined by SS preference assessment. According to caregivers, EN's preferences are as follows: country-western, classic hymns, popular musicals, lounge, big band, classical, and jazz.

Using Spearman's rank-order correlation, the stimulus preference assessment and caregiver report was also not significantly correlated,  $r(7) = -.072, p = .878$ . Family member surveys could not be obtained for this participant; therefore, there is no correlational data between stimulus preference assessment and family member report, and family member report and caregiver report.

**Participant WP.** The order of preferred music for WP according to the preference assessment, in order from most to least preferred are as follows: lounge, jazz, popular musicals, big band, classical, country-western and classic hymns. See Figure 9 for positive affect observed during each stimulus preference session and Figure 10 for overall preference (data aggregated across all three sessions) as determined by SS preference assessment. According to caregivers, WP's preferences are as follows: big band, classical, popular musicals, lounge, classic hymns, jazz, and country-western.

Using Spearman's rank-order correlation, the stimulus preference assessment and caregiver report was also not significantly correlated,  $r(7) = .072, p = .878$ . Family member surveys could not be obtained for this participant; therefore, there is no correlational data between stimulus preference assessment and family member report, and family member report and caregiver report.

## **Chapter IV**

### **Discussion**

The results of the study provide evidence that family members and caregivers are generally inaccurate when determining preferred music of participants with moderate to severe dementia. This was demonstrated by the lack of significant correlations between the single stimulus preference assessment and family member ranking, preference assessment and caregiver ranking, and family member or caregiver ranking. This study provides results similar to the Mesman et al. (2011) study which demonstrated the inaccuracy of family member and caregiver ranking of preferred items in an older adult population with moderate to severe cognitive impairment.

### **Strengths**

The study had several strengths. First of all, the single stimulus preference assessment conducted with the participants provided an empirical method to determine positive reactions to different genres of music. The preference assessments also allow individuals who normally do not have an active role in their care to make decisions. The ability to make choices through a preference assessment can improve the quality of life of severely impaired individuals, who otherwise would be unable to indicate preferences. The preference assessment is also a practical way to identify preferred music and can be easily implemented in the future by staff or family members.

The preference assessment also yielded a discrete ranking of preferred music, with the exception of two participants, EN and CJ, in which there was a tie between two genres of music. However, there was always a clearly identifiable most-preferred music genre for all participants. Furthermore, because three different preference assessments

were conducted with each participant, a larger sample of individual preferences were obtained, making it less likely that extraneous factors (e.g., day-to-day fluctuations in fatigue, mood, hunger, amount of social interaction) influenced the results. For example, during the first session participant WP was very talkative and eager to comment on the music; however, in the last session he rarely spoke and sat quietly listening to the music. Therefore, a relatively accurate and representative picture of musical preferences was likely obtained.

The structure of the preference assessment sessions also provided strength to the design of the study. General affect was observed during an initial two-minute baseline (i.e., no music) interval as well as two-minutes of non-music between each song. This provided a baseline of general affect and behavior by which to compare the music conditions. Therefore, when positive affect was observed during the music intervals, it could be concluded that this change in affect was due to the music and did not represent affect due to other factors. Finally, using two different songs from each genre and playing them for three minutes allowed participants to be exposed to the music for an adequate amount of time so as to have an opportunity to react to the music. This likely provided a more accurate description of preferred music between the genres.

All the participants appeared to enjoy the music presented in the preference assessment sessions, even if it may have been a genre ranked as least preferred. The participants also appeared to enjoy the interactions with the researchers during and after the preference assessments, even at times expressing joy that the researchers would be coming back to see them. Although the sessions were not individualized in terms of music, after the initial session with the participants, the researchers were able to estimate

the types of positive reactions that the participant was most likely to portray at proceeding sessions. Also, because the definition for positive reaction was fairly broad and allowed for a wide range of reactions, this allowed for some individualization in behavior for each participant. Even though the most popular reaction was toe tapping, there were several other reactions observed, such as: singing, whistling, head bobbing, smiling, rocking to the music, and making positive comments such as, “this is nice.”

The recording procedure provided strength to the study. Behavior was recorded during every other interval, which simplified the procedure and allowed the observer to record the specific positive reaction displayed by the participant. Furthermore, the observer was able to record any comments about the specific song provided by the participant. Finally, inter-observer agreement was high across all participants, suggesting that the definition provided of positive affect proved sufficient in capturing the possible reactions of the participants.

### **Limitations**

Despite numerous strengths, there were also several limitations to the study. First, the sample size was small (N=5). Also, we were unable to obtain family member surveys for two of the five participants, decreasing the correlational data in an already small sample. Although there were nine individuals initially recruited for the study, four of individuals were either unable to participant in the study or not appropriate for the study. One resident passed away, one resident moved facilities after sustaining a hip injury, one resident had significant hearing problems and another individual was able to indicate preference verbally with accuracy. Arguably, with a larger sample size the significant

correlations between the preference assessment and caregiver and family member rankings could have been found.

Certain characteristics of the sample also represent a limitation to the study. For example, the music chosen for the sessions was based on having participants in their early to mid 80s; therefore music chosen was chosen based on the knowledge that the participants would have been adolescents, typically when individuals begin to form a personal music identity, in the early to mid 1940s (Tarrant, North & Hargreaves, 2000). However, two participants were older and would have been slightly older during the early to mid-1940s. One gentleman was 95 years old (LG) and another woman (SA) was 90 years old. This older woman was also originally from Germany; therefore, this may have affected what would be considered popular music for her when she was a teenager.

The male participants, LG and WP, also were very talkative during two of the sessions conducted. This explains the relatively high percentage of positive affect observed during the baseline intervals where no music was played. Although conversing with participants during intervals where no music was played could inflate how much positive affect was displayed during those intervals, it would be impractical to not converse with the participants when they engaged in conversation with the researcher and research assistant. Despite the high percentage of positive affect observed during non-music intervals, greater amounts of positive affect were observed during certain genres of music, indicating that some types of music were preferred over intervals without music.

In addition, for a few participants there was a poverty of affect at times. For several minutes of music and non-music intervals, researchers observed no affect from

some participants. Again, this was another reason why it was important to conduct three sessions and aggregate the data.

The length of the sessions also provided some limitations to the study. An entire preference assessment could last 70 minutes from beginning to end. At times, 70 minutes of engagement may be difficult to ask of an individual with moderate to severe cognitive impairment. One participant in particular, EN, was unable to complete the first two sessions in their entirety. This required that the sessions be broken up into two separate sessions of 35 minutes each. However, she was able to complete the last session in its entirety.

While proving a strength of the study, two-minute non-music intervals could also have been a limitation. For example, when there was a poverty of environmental stimuli at times a participant would stand up and attempt to walk away. This required redirection from the researcher and sometimes redirection was not possible. Also, because the area in which the music was presented was small and required the participant, researcher and research assistant to sit fairly close together, the observer recording affect may have been distracting to the participant. One participant in particular, LG, appeared distracted by the recording process and several times asked what the observer was writing. It may have been more beneficial to video record the sessions and have the observers record data without the participant present.

Family members' relationships with the participants could have also served as a limitation to the study. Although all family members were indicated as the primary contact for that individual, it is unknown the nature of the relationship with the participant. Some family members may not visit the participants frequently and therefore



may actually know little about their musical preferences. A future study should make efforts to ensure that the family member completing the survey has regular contact with the participant.

Aspects of the family and caregiver survey also had some limitations. For each genre listed on the survey, one example is listed for the family and caregiver to make a more informed decision. Because only one song was listed as an example, it may have been more beneficial to list both songs presented during the preference assessment. This may have provided more clarity to the survey and allowed for family member and caregivers to make a more informed decision when ranking preferred musical genres.

The researchers typically conducted the sessions in the afternoon, before mealtime, and attempted to consistently come at the same time for each session. However, the time of day could have affected the mood and observed affect of the participants. The staff indicated that the best time to come for most participants was in the afternoon and there was also a practical limitation of when the researcher and research assistant could visit the participants. Staff did indicate that participant EN was most alert in the morning, so all but one session was conducted in the morning. Further research should investigate how the time of day the sessions are conducted affect the observed positive affect of the participants.

Overall, this study was a first step to develop a better method for improving the efficacy of individualized music interventions; however, it is unknown whether the music found during the preference assessment would actually improve the efficacy of a music intervention (i.e., does the music preference assessment have treatment utility). Future research is needed to compare the efficacy of a music intervention involving preferred

music identified by a preference assessment and preferred music identified by family members and caregivers.

### **Implications**

The findings of this study have several implications. First, the study suggests that a preference assessment can be used as a way to improve the quality of life for individuals with moderate to severe cognitive impairments, who may be otherwise unable to indicate preferences. The SS preference assessment is easy to conduct and produces different results than opinions of family members or facility staff. Having an alternative method for determining preferences is especially important when family members are unable to participate in an individual's care and when family and professional staff are not familiar with the preferred music of the individual. Also, results from this study indicated that even those family members who may have been familiar with a participant's musical preference were inaccurate in the ranking of preferred genre. One reason for this may be that personality changes commonly occur with dementia; therefore, an individual's music preference may change. A preference assessment represents an easy way to determine what preferences are, even when personality changes occur.

The study also indicates that a music preference assessment could be added to a music therapy treatment plan for an individual with dementia. Music preference is very personal and inaccurate assumptions by staff and family of the type of music a resident may enjoy could have a negative impact on the efficacy of a music intervention. As the music therapy literature indicates, individualized or preferred music has demonstrated greater reductions in agitation and aggressive behaviors (Gerdner, 1999; Thomas,

Heitman & Alexander, 1997). Adding a music preference assessment to a music intervention could further reduce combativeness during daily care routines and increase positive affect, making it easier for staff to care for residents with dementia and reduce injury to residents and staff. Furthermore, caregivers in long-term care facilities often have considerably high turnover rates and experience greater mental and physical strain, causing lower quality of care for the residents (Buchanan et al., 2007). More individualized music interventions could reduce stress on caregivers and therefore increase quality of care.

A music preference assessment could be used as a medium in which to engage participants and increase positive stimuli in the older adult's environment. Music could also be used as a reinforcer for an individual with dementia and as a more passive method of entertainment.

Finally, if replicated with a larger and more diverse sample size, this line of research could indicate the type of music typically preferred by individuals with dementia of a certain cohort and demographic. Although a brief individualized preference assessment may still prove useful, creating a database of typical preferred music to reference could add to quality of life and care received. However, because music preference is normally very personal, more extensive research is needed to determine if there are usual genres that older adults with dementia prefer.

### **Future Research**

This study provides a basis for future research in the music therapy literature. Because this study is the first of its kind, future research is needed to replicate and validate the findings. A larger sample size is needed with a more diverse population of

participants, especially in terms of age, gender, ethnicity and severity of cognitive impairment. The study only included five Caucasian individuals, all from Southern Minnesota with the exception of the participant originally from Germany. All participants had very low MMSE scores, with the highest being an 11, indicating that all participants had severe cognitive impairments. Future research should also include those individuals with more moderate impairment.

Future research is also needed to examine whether preferred music as indicated by the preference assessment is more useful in terms of reducing agitation or aggression in daily care routines when compared to the least preferred music or music chosen by family or staff. This could be done as part of a larger study examining the efficacy of a music intervention on reducing agitation during care. It is important to examine the difference in affect and combativeness observed between the most and least preferred music as indicated by a preference assessment.

It is also important that future research examines the use of an even more individualized approach for a music preference assessment. For example, choosing music to include during a preference assessment based on an individual's age and place of birth may be the best method of determining preferred music. Rather than including the same music in the preference assessment for all participants, it may be more beneficial to personalize each music preference assessment.

### **Conclusion**

The findings of this study support the utility of a music preference assessment to identify preferred music for individuals with dementia who otherwise are unable to indicate preference. Often preferred music is chosen arbitrarily by family members or

staff and as the findings of this study indicate, these individuals are often inaccurate when asked to choose preferred music. This study suggests that a stimulus preference assessment may be a better means for choosing music to be used for a music intervention. Consequently, the efficacy of music-based interventions may be improved by using this simple, empirical method to indicate preference.

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*Table 1:* Correlations between SS preference assessment and family member report, SS preference assessment and caregiver report and family member report and caregiver report.

Variable	Participant				
	SA	CJ	LG	EN	WP
SS & Family	-.214	.018	-.500		
SS & Caregiver	.617	.092	.231	-.072	.072
Family & Caregiver	.299	.400	-.309		

*Table 2:* Musical genres in order most preferred to least preferred according to preference assessment, family member report and caregiver report.

SA		
Stimulus Preference Assessment	Family Member Report	Caregiver Report
(1) Country-Western	(1) Classical	(1) Country
(2) Lounge	(2) Lounge	(2) Classical
(3) Jazz	(3) Classic Hymns	(3) Classic Hymns
(4) Classical	(4) Big Band	(4) Popular Musicals
(5) Big Band	(5) Popular Musicals	(5) Jazz
(6) Popular Musicals	(6) Country-Western	(6) Lounge
(7) Classic Hymns	(7) Jazz	(7) Big Band

CJ		
Stimulus Preference Assessment	Family Member Report	Caregiver Report
(1) Popular Musicals	(1) Big Band	(1) Popular Musicals
(2) Big Band	(2) Classical	(2) Classical
(3) Lounge	(3) Lounge	(3) Classical Hymns
(4) Country-Western	(4) Classical Hymns	(4) Lounge
(5) Jazz	(5) Popular Musicals	(5) Big Band
(6) Classic Hymns	(6) Country-Western	(6) Country-Western
(7) Classical	(7) Jazz	(7) Jazz

LG		
Stimulus Preference Assessment	Family Member Report	Caregiver Report
(1) Country-Western	(1) Classic Hymns	(1) Classic Hymns
(2) Lounge	(2) Classical	(2) Lounge
(3) Big Band	(3) Jazz	(3) Popular Musicals
(4) Jazz	(4) Country-Western	(4) Country-Western
(5) Classical	(5) Big Band	(5) Classical
(6) Popular Musicals	(6) Popular Musicals	(6) Big Band
(7) Classic Hymns	(7) Lounge	(7) Jazz

EN		
Stimulus Preference Assessment	Family Member Report	Caregiver Report

Assessment	
(1) Popular Musicals	(1) Country-Western
(2) Jazz	(2) Classic Hymns
(3) Lounge	(3) Popular Musicals
(4) Country-Western	(4) Lounge
(5) Classic Hymns	(5) Big Band
(6) Classical	(6) Classical
(7) Big Band	(7) Jazz

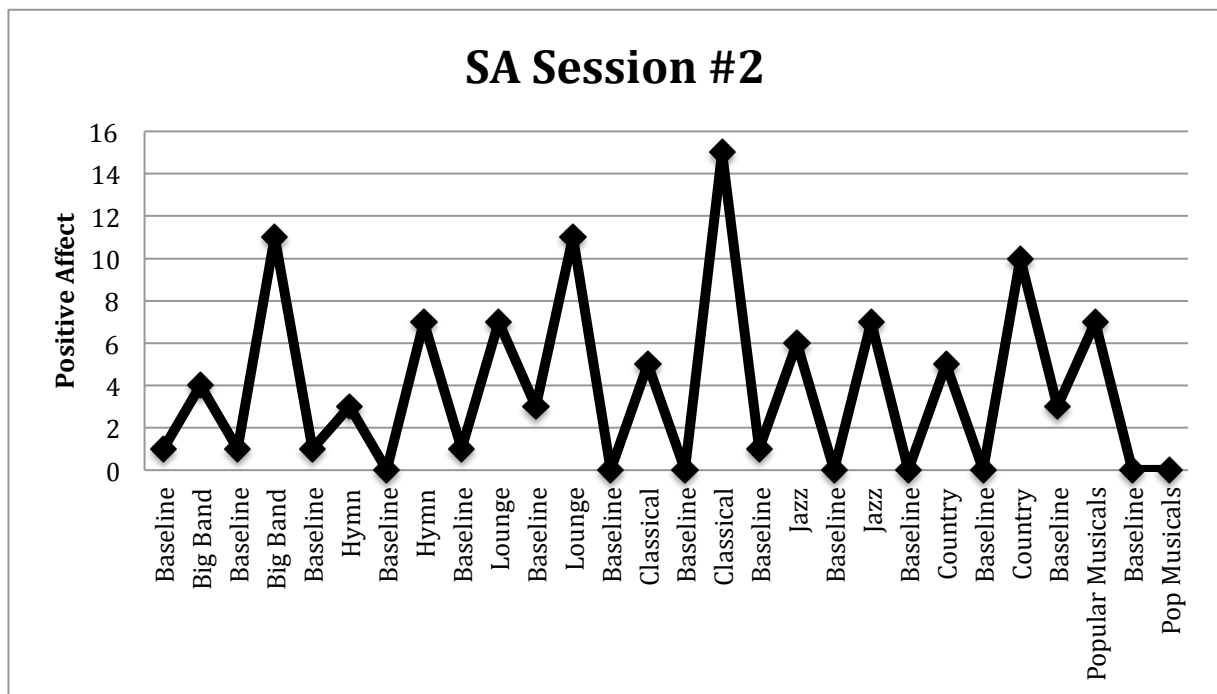
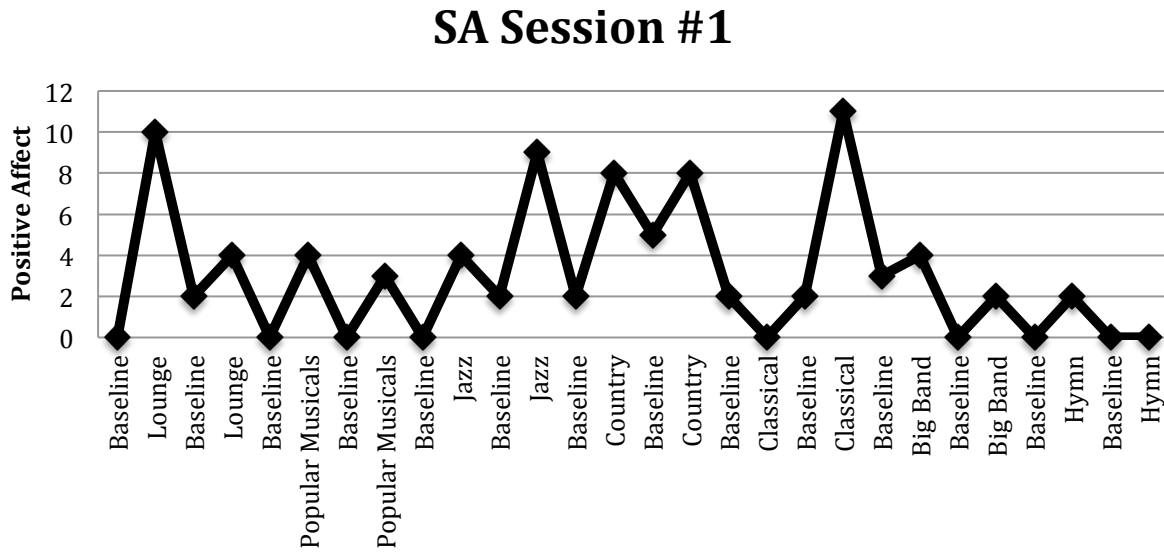
WP

Stimulus Preference Assessment	Family Member Report	Caregiver Report
(1) Lounge		(1) Big Band
(2) Jazz		(2) Classical
(3) Popular Musicals		(3) Popular Musicals
(4) Big Band		(4) Lounge
(5) Classical		(5) Classic Hymns
(6) Country-Western		(6) Jazz
(7) Classic Hymns		(7) Country-Western

*Table 3:* Aggregate data for each genre per preference assessment in order from most to least preferred.

	SA	CJ	LG	EN	WP	Total
Jazz	40/108	24/108	48/108	37/108	61/108	210/540 = 38.89%
Lounge	29/108	25/108	54/108	34/108	62/108	204/540 = 37.78%
Popular Musicals	29/108	36/108	41/108	40/108	51/108	197/540 = 36.48%
Country- Western	48/108	24/108	63/108	22/108	27/108	184/540 = 34.07%
Big Band	38/108	27/108	49/108	19/108	44/108	177/540 = 32.78%
Classical	39/108	14/108	45/108	7/108	34/108	139/540 = 25.74%
Classic Hymns	20/108	18/108	24/108	7/108	22/108	91/540 = 16.85%

Figure 1: Positive affect observed during no music and music conditions.



### SA Session #3

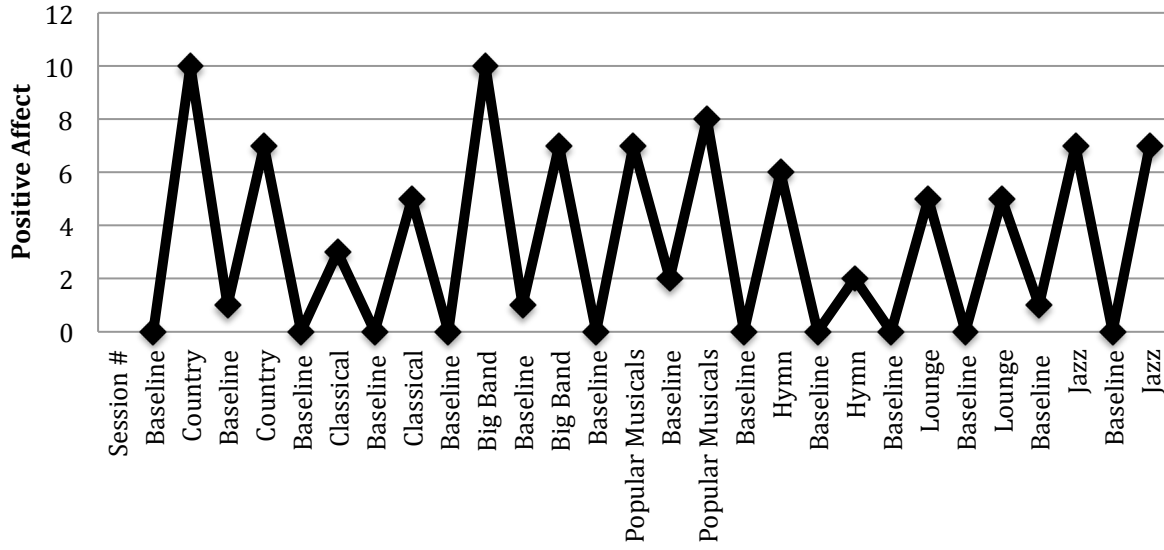


Figure 2: Percentage of intervals in which positive affect was observed, aggregated across SS preference assessment sessions.

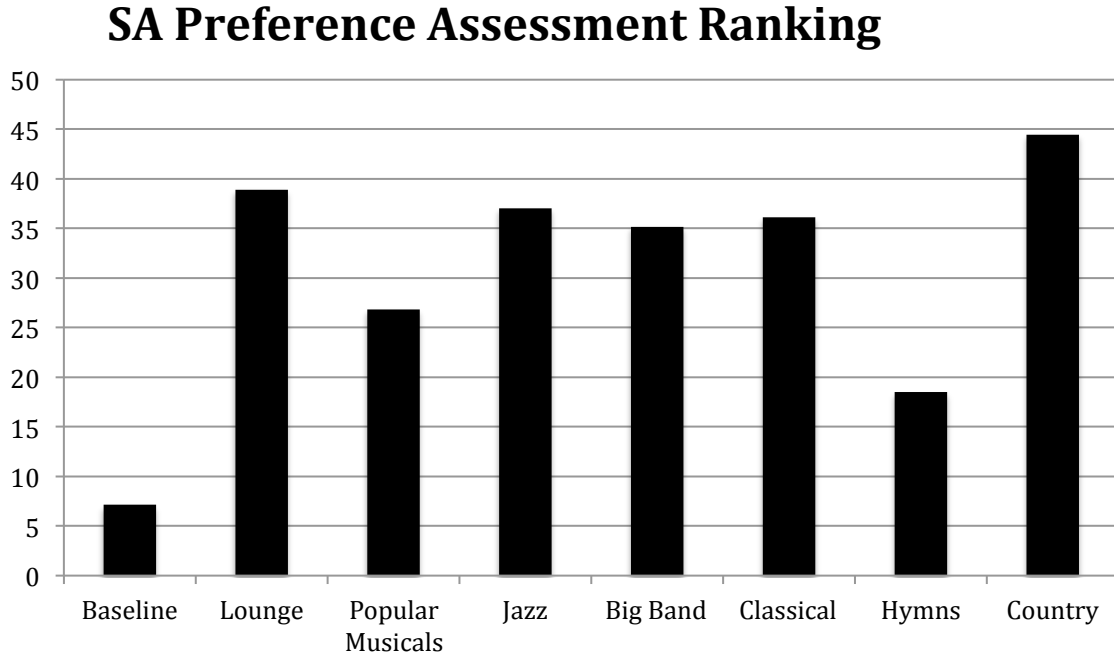
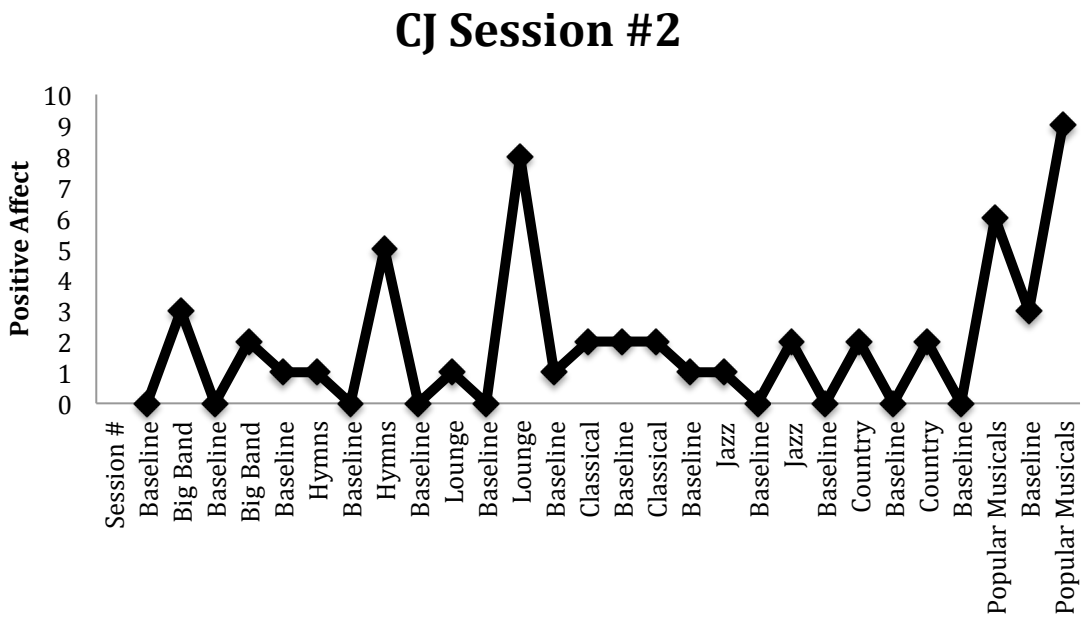
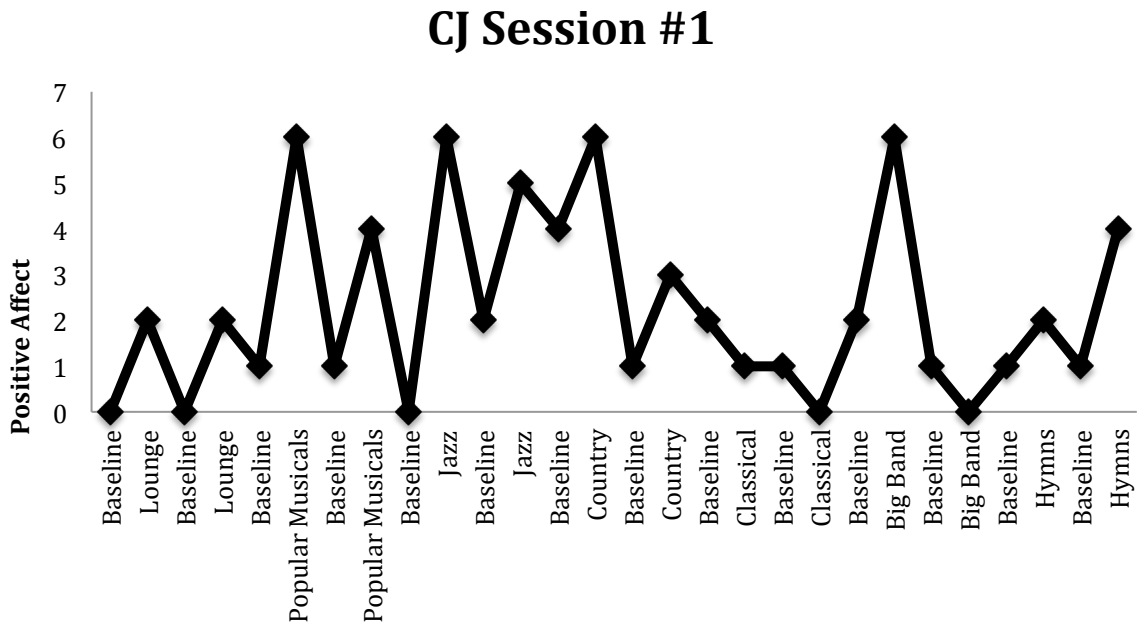




Figure 3: Positive affect observed during no music and music conditions.



### CJ Session #3

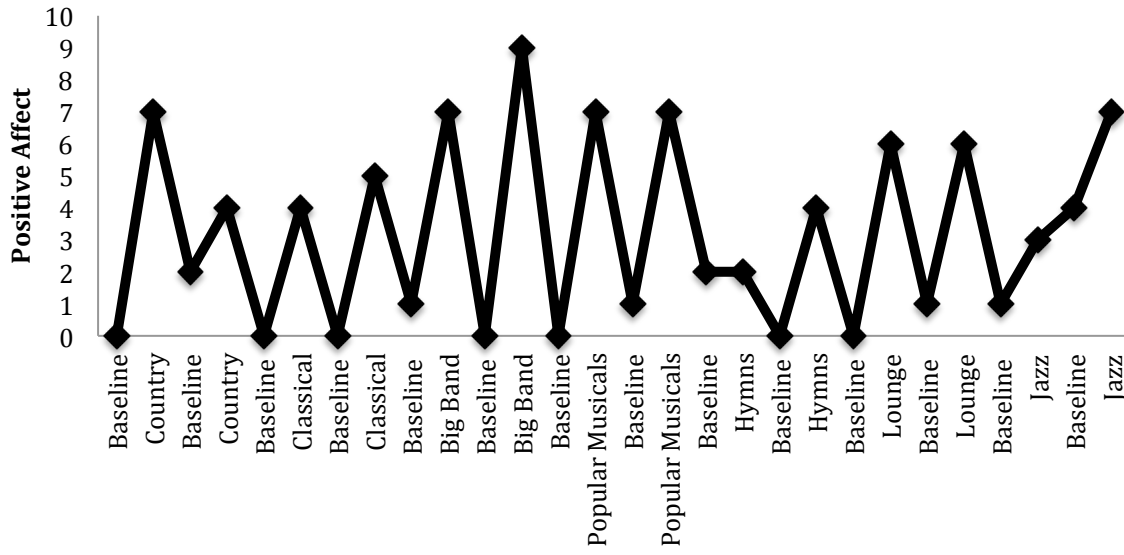
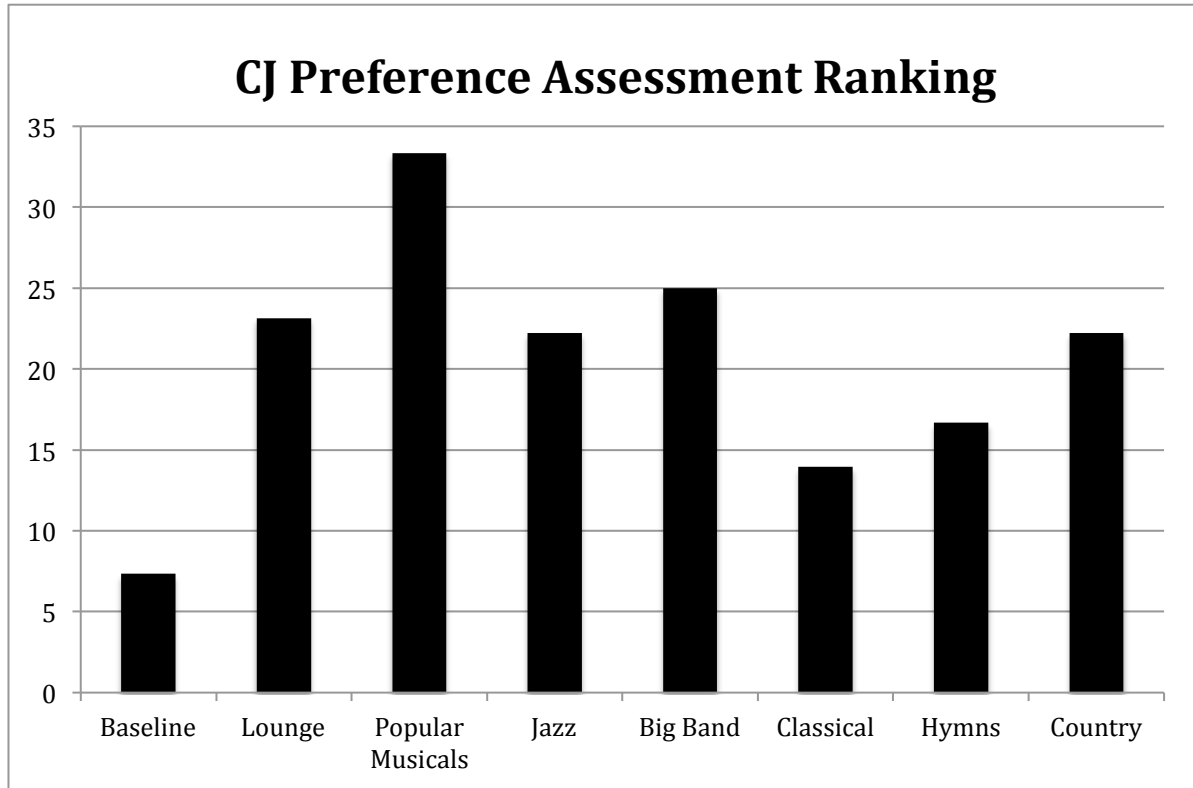
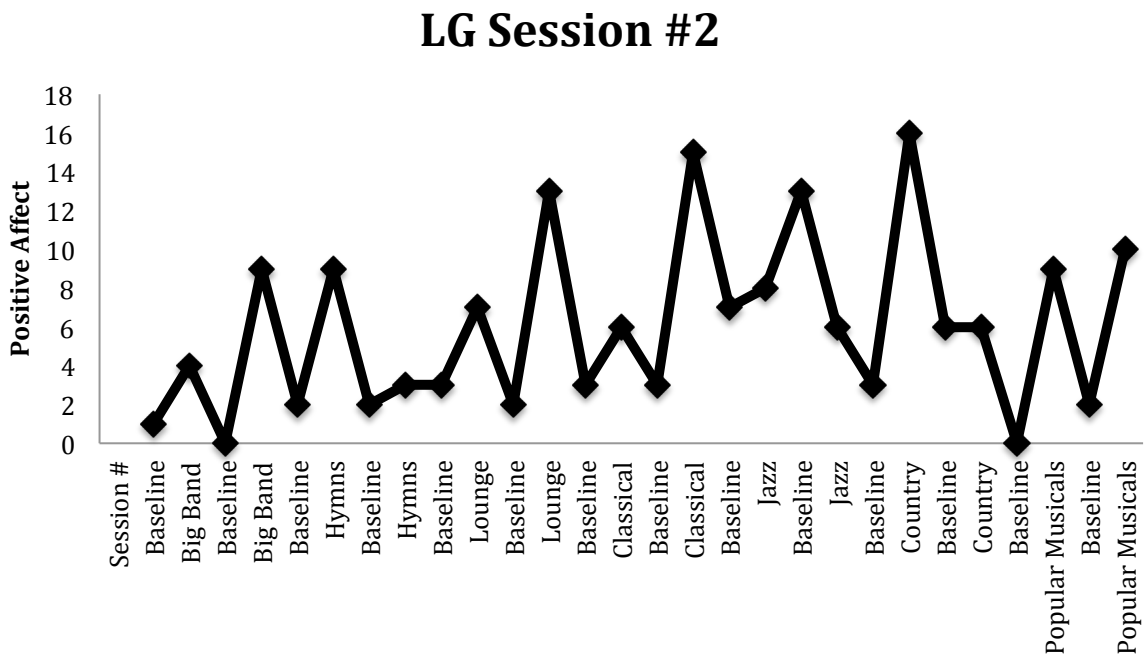
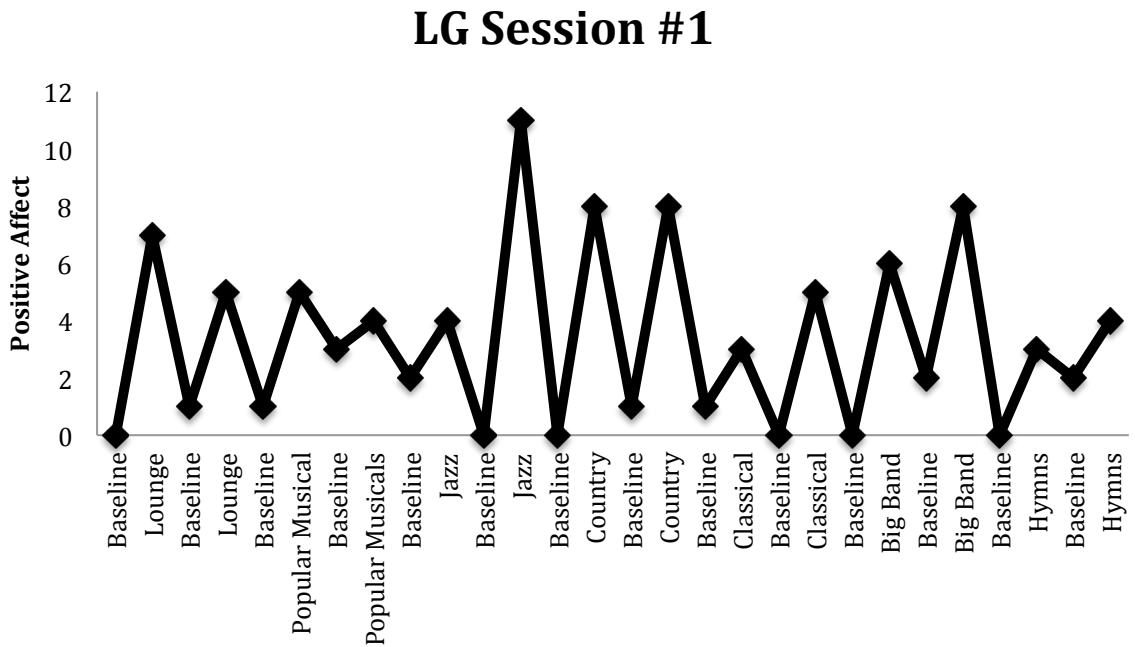


Figure 4: Percentage of intervals in which positive affect was observed, aggregated across SS preference assessment sessions.

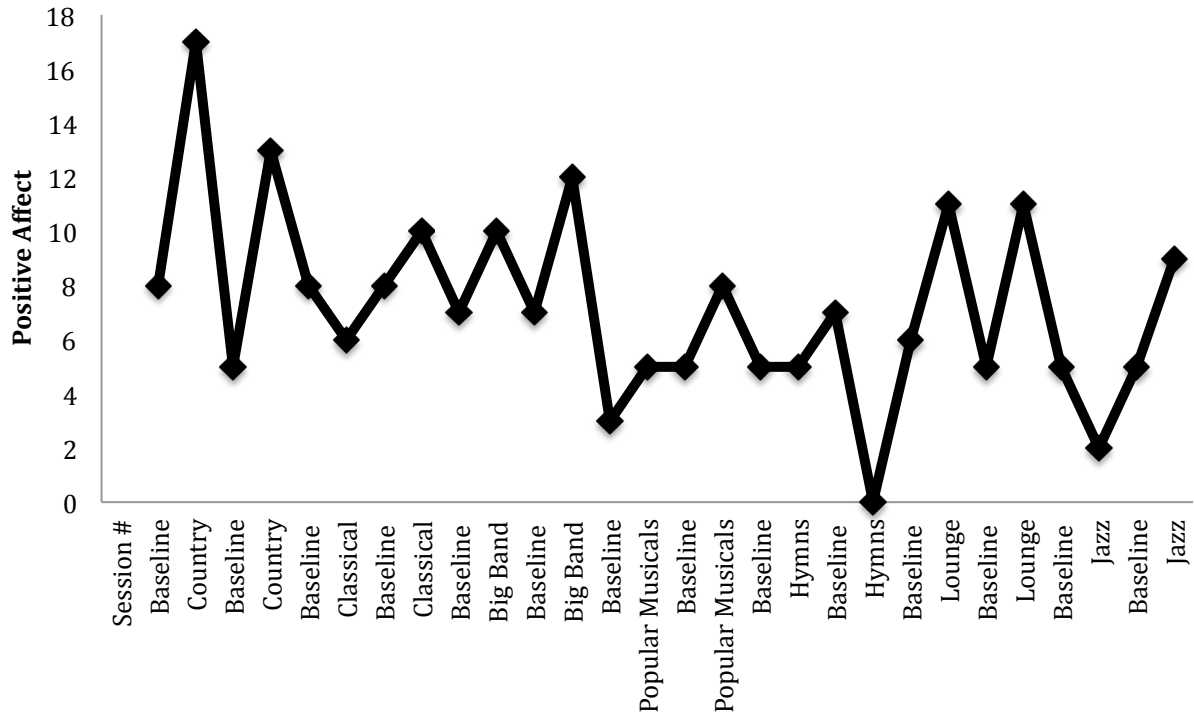


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Figure 5: Positive affect observed during no music and music conditions.



### LG Session #3



*Figure 6:* Percentage of intervals in which positive affect was observed, aggregated across SS preference assessment sessions.

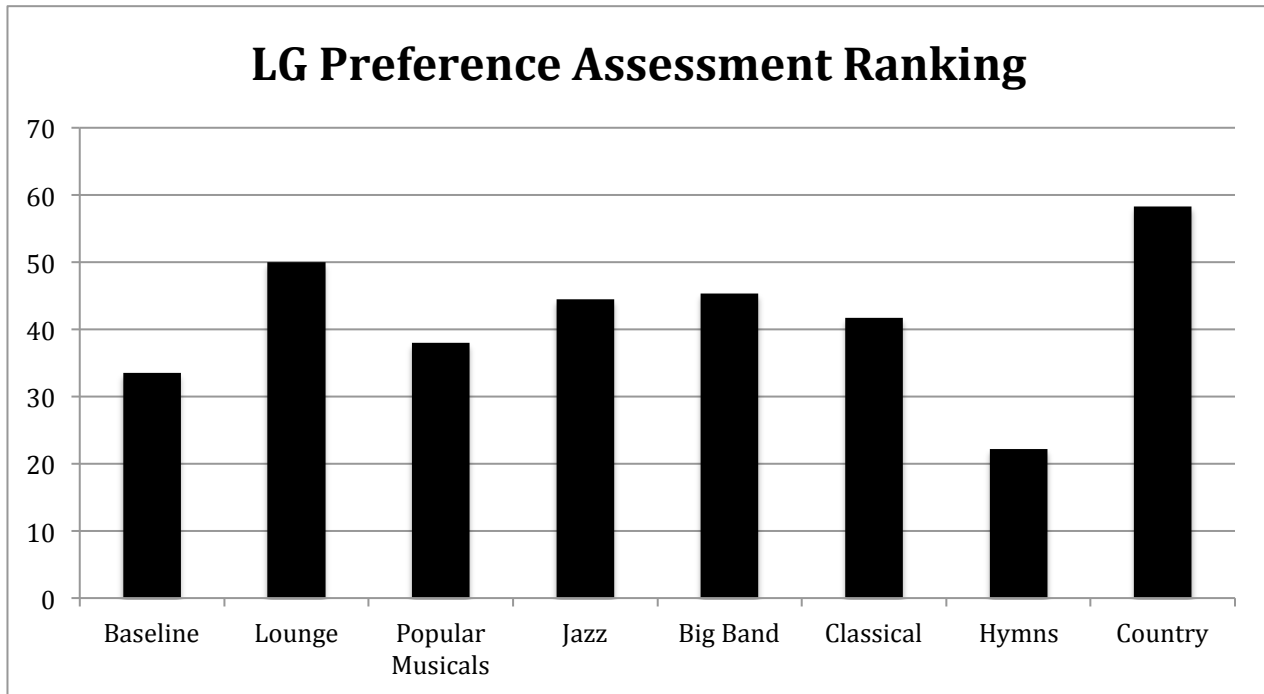
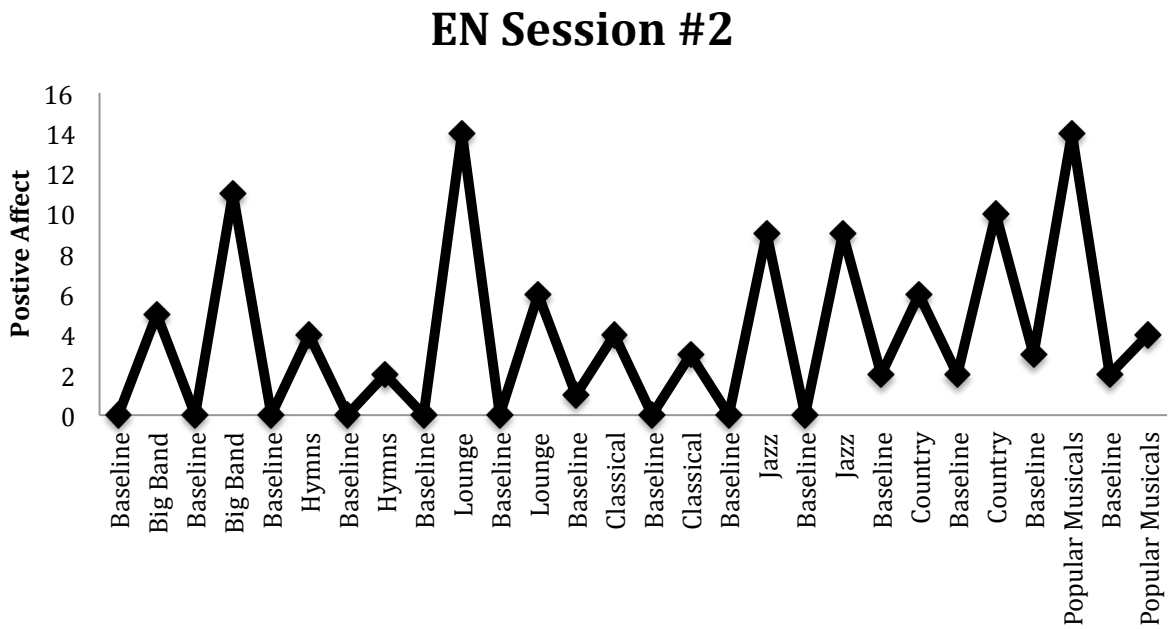
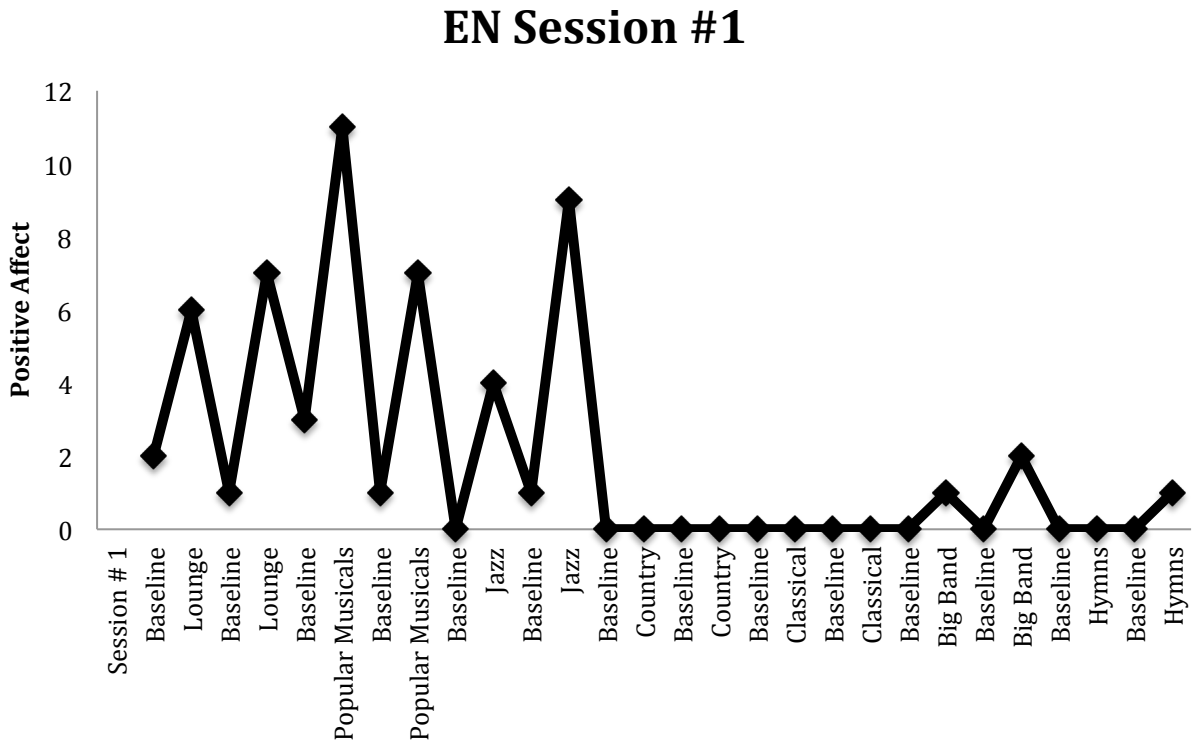


Figure 7: Positive affect observed during no music and music conditions.



### EN Session #3

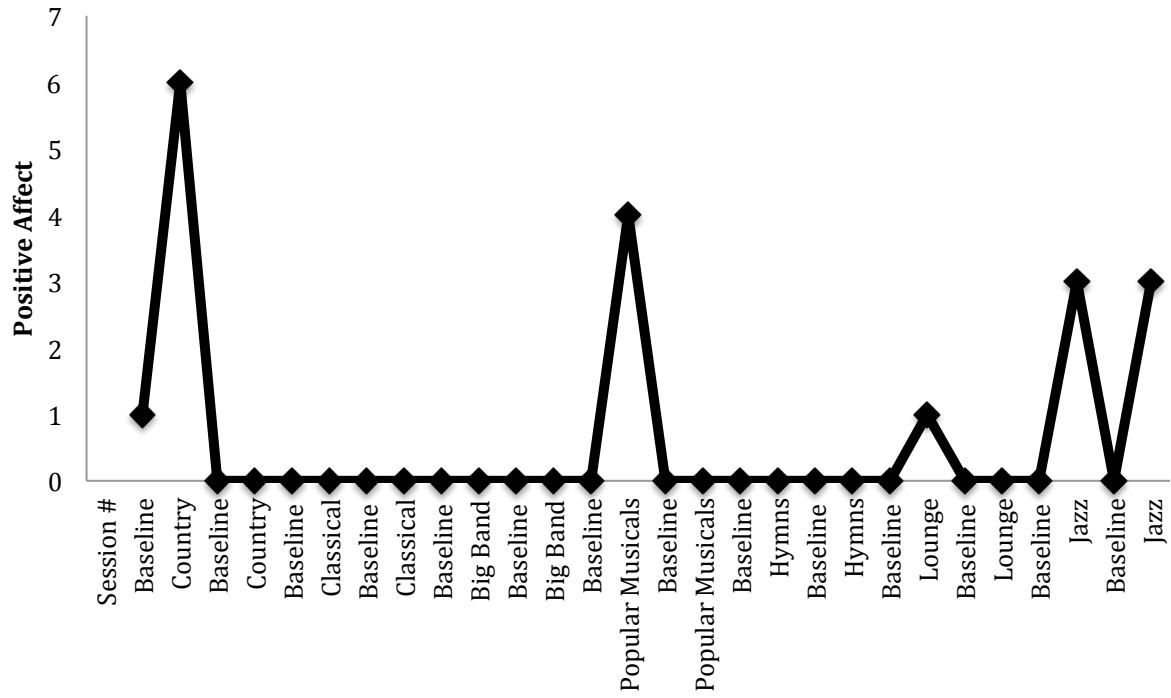




Figure 8: Percentage of intervals in which positive affect was observed, aggregated across SS preference assessment sessions.

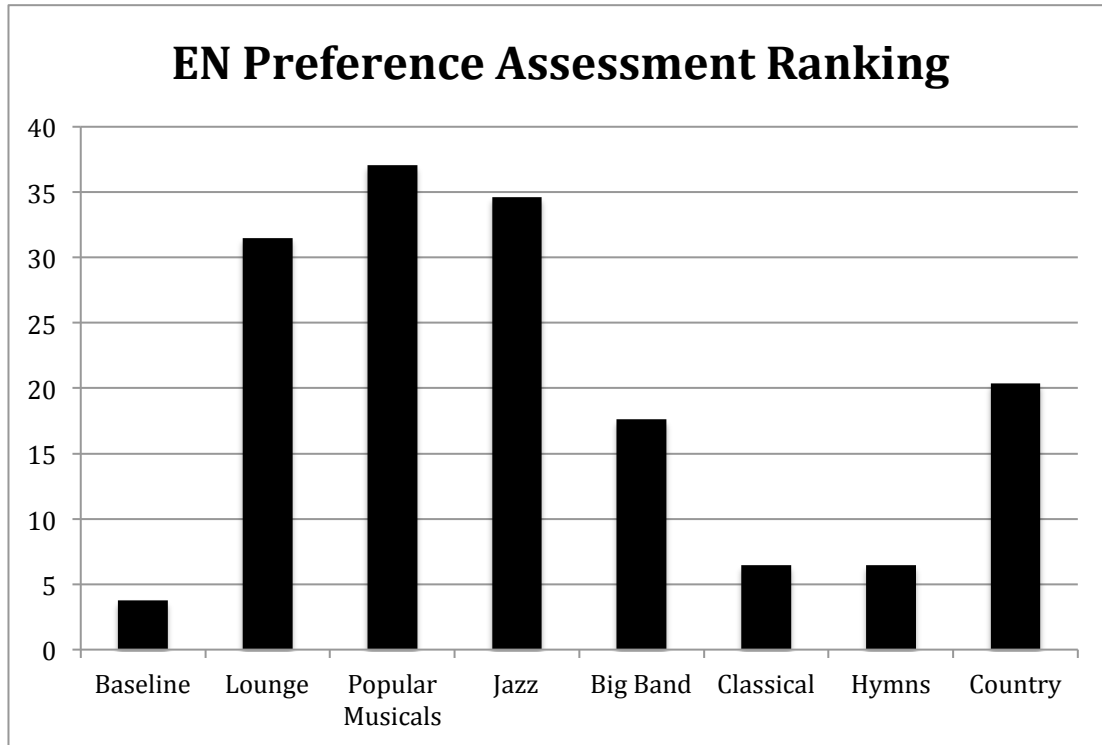
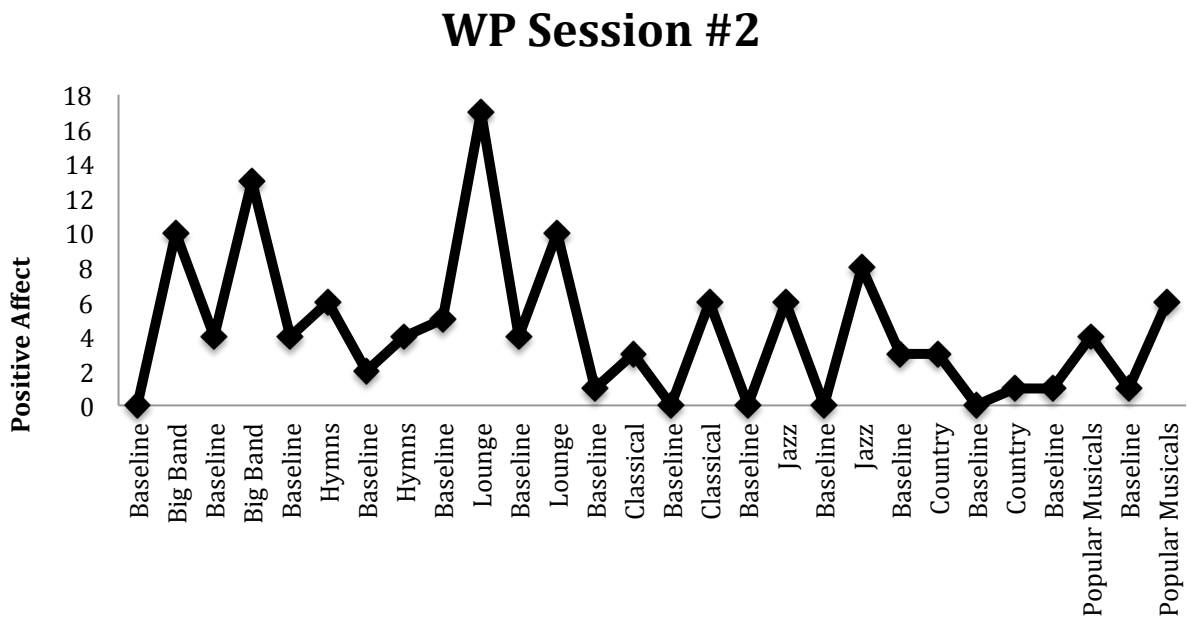
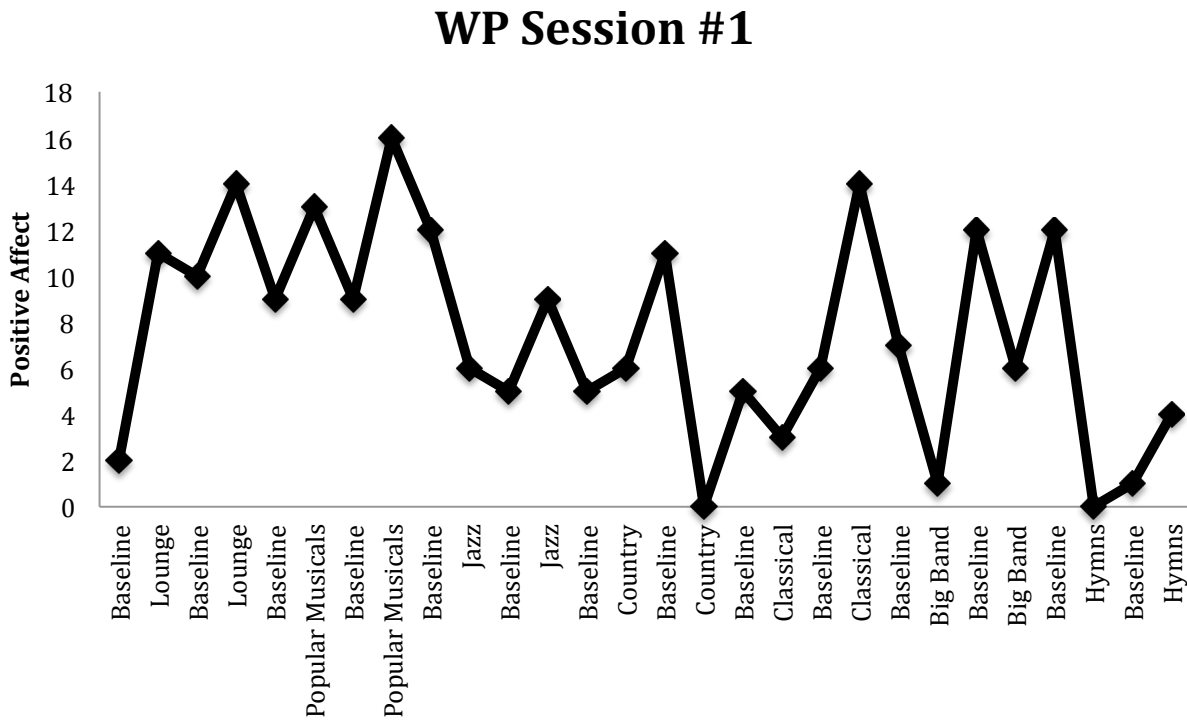


Figure 9: Positive affect observed during no music and music conditions.



### WP Session #3

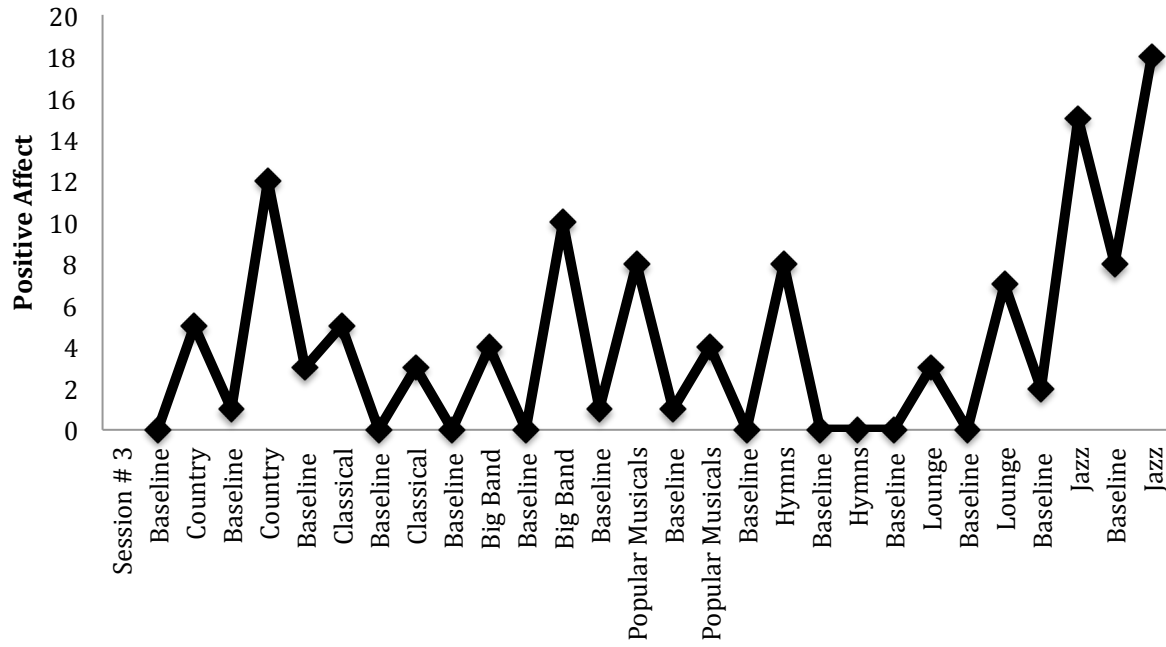
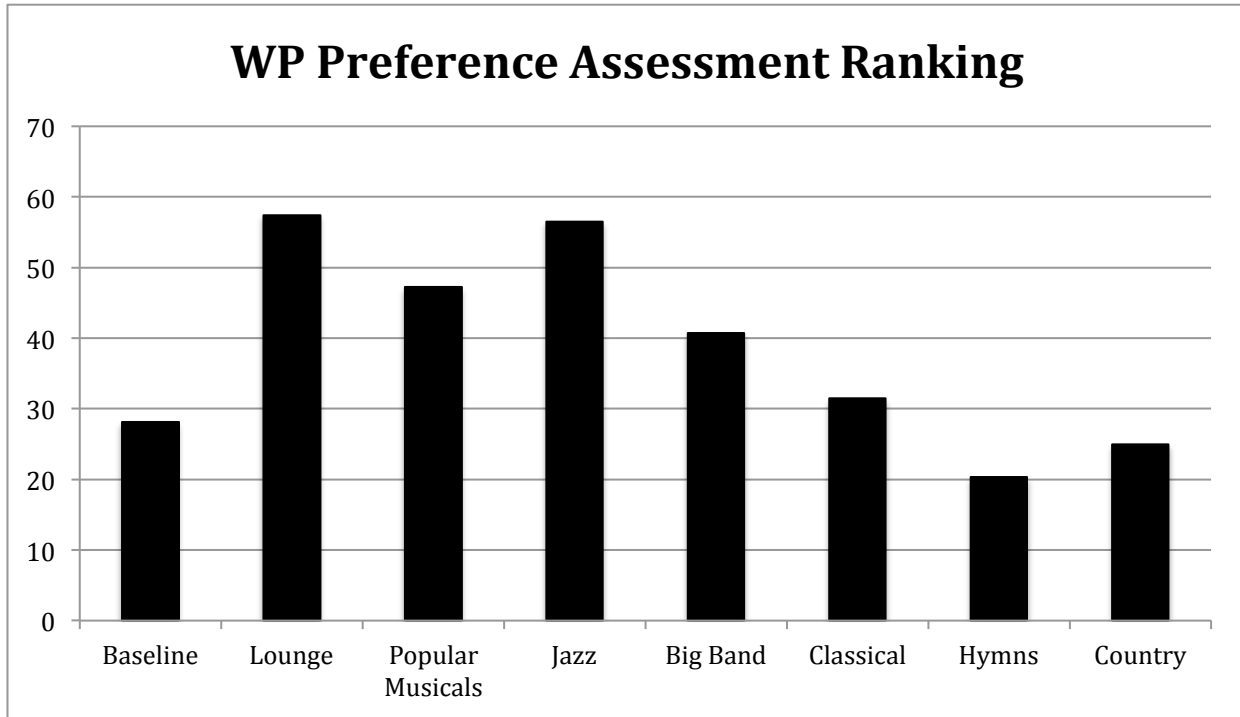


Figure 10: Percentage of intervals in which positive affect was observed, aggregated across SS preference assessment sessions.



**Appendix A****Family and Caregiver Preference Survey**

These are seven types of music individuals might prefer. Please rank the following types of music using a 1 -7 scale (1 = most preferred and 7 = least preferred) on how much you think the individual listed below would prefer each item. Please use each number only once.

Name of participant: \_\_\_\_\_

Jazz (ex: Billie Holiday) \_\_\_\_\_

Country Western \_\_\_\_\_

(ex: Tex Ritter, Ernest Tubb)

Lounge Music \_\_\_\_\_

(ex: Frank Sinatra, Jimmy Dorsey)

Classical Music \_\_\_\_\_

(ex: Richard Wagner, Strauss)

Big Band Music \_\_\_\_\_

(ex: Duke Ellington)

Popular Musicals \_\_\_\_\_

(ex: Judy Garland, Bing Crosby)

Classic Hymnals \_\_\_\_\_

(ex: Morning has Broken; Holy, Holy, Holy)

## Appendix B

### **Jazz:**

- “God Bless the Child” by Billie Holliday
- “Chattanooga Choo Choo” by Glenn Miller

### **Lounge music:**

- “New York, New York” by Frank Sinatra
- “Green Eyes” by Tommy and Jimmy Dorsey

### **Popular musicals:**

- “White Christmas” by Bing Crosby
- “When You’re Smiling” by Judy Garland

### **Country-western:**

- “There’s a New Moon Over my Shoulder” by Tex Ritter
- “It’s Been so Long Darling” by Ernest Tubb

### **Classical:**

- “The Flying Dutchman” by Richard Wagner
- “Blue Danube Waltz” by Strauss

### **Classic Hymnals:**

- “Morning has Broken” by Nena Mouskouri
- “Holy, Holy, Holy” by Mormon Tabernacle Choir

### **Big Band:**

- “Take the ‘A’ Train” by Duke Ellington
- “In the Mood” by Glenn Miller

## Appendix C

### Informed Consent for Participation in the Research

#### **Purpose**

I understand that the purpose of this research is to test a procedure for identifying music that persons with memory impairment might enjoy. The experimenters will then compare the results of the procedure with staff and family opinions of what the person might enjoy to determine how similar they are.

#### **Participants**

I understand that the person for whom I am a guardian has been asked to participate because they have been diagnosed with a condition that causes memory impairment and have impaired verbal abilities.

#### **Procedure**

I understand the experimenter will ask the individual several questions to assess the individual's memory and language abilities. Also, I understand that the experimenter will take seven musical pieces and present them to the individual one at a time. Research staff will record which piece the individual prefers by measuring the individual's orientation to the object (i.e., looking or reaching at the stimuli, smiling, etc.). The procedure will end when all musical pieces have been presented, which will take approximately 15 minutes. This procedure will be done a total of three times on three separate days, so the individual will participate in this study for a total of approximately 45 minutes.

#### **Risks**

I understand that there are minimal risks associated with participation in this study. It is possible that an individual may become upset when a preferred piece of music is stopped. If the individual appears to become upset, the music will be immediately played and they will be allowed to listen to it until they appear to lose interest. A second potential risk is that an individual will become fatigued during the procedure. If a participant appears to be fatigued, the session will be terminated immediately.

#### **Benefits**

I understand that the participants may not benefit directly from participating in the study. The results of this study, however, may yield useful information to assist caregivers of dementia individuals in identifying potential reinforcers for the individual. Thus, the results may lead to improved quality of care for persons with dementia.

#### **Confidentiality**

I understand that the findings of this study will be completely confidential. Confidentiality will be protected in that no identifying information will be included on any records collected during this study. All information will be kept in a locked cabinet and destroyed after three years.

**Right to Refuse or Withdraw**

I understand that I may refuse to allow my family member to participate or withdraw them from the study at any time without penalty. Furthermore, withdrawal from the study may occur if the participant becomes agitated or fatigues during any part of the study.

**Questions**

I have been informed that if I have any questions, I am free to ask them. I understand that if I have any additional questions later, I may contact the office of the principal investigator, Jeffery Buchanan, PhD at (507) 389-5824 or the student investigator Eva Iglar at (920)265-2312.

**Closing Statement**

My signature below indicates that I have decided to allow my family member to participate in a research study and that I have read this form, understand it, and have received a copy of this consent form.

---

Signature of Legally Responsible Person

---

Date

---

Signature of Investigator

---

Date



**Appendix D**  
**(Family Member)**  
**Informed Consent for Participation in the Research**

**Purpose**

I understand that the purpose of this research is to test a procedure for identifying preferred music that persons with advanced dementia might enjoy. The experimenters will then compare the results of the procedure with family opinions of what the person might enjoy to determine how similar they are.

**Participants**

I understand that I have been asked to participate because I am a guardian of someone who has been diagnosed with a condition that causes memory impairment.

**Procedure**

I understand that I will be asked to complete a survey in which I will estimate how much the individual might prefer several different musical pieces.

**Risks**

I understand that there are no known risks associated with completion of the survey.

**Benefits**

I understand that I may not benefit directly from participating in the study. The results of this study, however, may yield useful information to assist caregivers of dementia patients in identifying potential reinforcers for the patient. Thus, the results may lead to improved quality of care for dementia patients.

**Confidentiality**

I understand that the findings of this study will be completely confidential. Confidentiality will be protected in that no identifying information will be included on any records collected during this study. All information will be kept in a locked cabinet and destroyed after three years.

**Right to Refuse or Withdraw**

I understand that I may refuse to participate or withdraw from the study at any time without penalty.

**Questions**

I have been informed that if I have any questions, I am free to ask them. I understand that if I have any additional questions later, I may contact the office of the principal investigator, Jeffery Buchanan, PhD at (507) 389-5824 or the student investigator Eva Iglar at (920)-265-2312.

**Closing Statement**

My signature below indicates that I have read this form, understand it, and have received a copy of it.

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Investigator

\_\_\_\_\_  
Date

**Appendix E**  
**(Professional Caregiver)**  
**Informed Consent for Participation in the Research**

**Purpose**

I understand that the purpose of this research is to test a procedure for identifying preferred music that persons with advanced dementia might enjoy. The experimenters will then compare the results of the procedure with family opinions of what the person might enjoy to determine how similar they are.

**Participants**

I understand that I have been asked to participate because I am a professional caregiver for persons with dementia.

**Procedure**

I understand that I will be asked to complete a survey in which I will estimate how much the individual might prefer several different musical pieces.

**Risks**

I understand that there are no known risks associated with completion of the survey.

**Benefits**

I understand that I may not benefit directly from participating in the study. The results of this study, however, may yield useful information to assist caregivers of dementia patients in identifying potential reinforcers for the patient. Thus, the results may lead to improved quality of care for dementia patients.

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**Closing Statement**

My signature below indicates that I have read this form, understand it, and have received a copy of it.

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of Investigator

\_\_\_\_\_  
Date