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The Effects of Familiar Music, Unfamiliar Music, and No Music on Face-Name Recall in Aging Adults

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THE EFFECTS OF FAMILIAR MUSIC, UNFAMILIAR MUSIC, AND NO MUSIC ON FACE-NAME RECALL IN AGING ADULTS

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ABSTRACT

The purpose of this study was to examine the effects of familiar music, unfamiliar music, and no music on face-name recall in aging adults. Residents from assisted living facilities and individuals living independently served as participants. Sixty participants were randomly assigned to a control group (no music) and two treatment groups (familiar music and unfamiliar music). Participants in treatments one and two heard the names set to either familiar music or unfamiliar music while they viewed the corresponding faces. Participants were invited to sing along as the song was sung three times. Participants in the control group condition heard the names spoken while they viewed the corresponding faces. Participants were then asked to: recall as many names as possible (free recall), given a name, select the correct face from a closed response set of three faces (recognition), and recall the correct name for each face (face-name recall). All sessions were audio taped in order to record participants’ verbal responses. Data taken from these tapes were then analyzed using a one-way analysis of variance (ANOVA) which indicated no significant differences between groups. While no significant difference was found between the groups, groups that received music had a higher mean score than did the control group. Furthermore, the group with familiar music had a higher mean score than did the group with unfamiliar music. Participants’ comments indicated that music made the recall task more enjoyable.
CHAPTER I
INTRODUCTION

The ‘graying of America’ is a frequently used term to describe the proliferation of the geriatric population. Mortality rates have decreased, leading to a world where living past the age of 65 can be expected. Scientific advances have eradicated many deadly diseases of the past, making it possible for Americans to live past 75 and even 85 years of age. In fact, between 1900 and 1994, the number of people over the age 65 increased 11-fold while the total population only increased 3-fold. The United States Census (2000) reported that there were 35 million people over age 65 compared to 31 million in 1990 which represents a 12 percent increase in just 10 years. The census estimated that the number of those 65 and older would increase to 36 million by 2003, and those 85 and over would increase in number from 4.2 million in 2000 to 4.7 million in 2003.

The Baby Boomer generation, those born between 1946 and 1964, will begin turning 65 by the year 2011. The number of aging adults will flourish in the 20 years following; thus the increase in aging has only just begun. Health and income trends indicate that those needing care in a nursing home will triple between 1990 and 2030 (United States Census, 2000). Health care workers need to be prepared for the ever-growing number of elderly clients in the upcoming years.

Due to the fact that Americans are now living longer, aging adults can expect to physically and mentally decline. They can be stricken physically with a myriad of diseases or common ailments ranging from heart disease to cancer to arthritis. They can also experience a decline in everyday memory performance. Improving memory can be beneficial to aging adults who are encountering everyday memory problems. Aging adults commonly have little confidence in their memory performance; therefore they are less inclined to utilize their
memory. Aging adults who are frustrated or anxious by their physical limitations are often appreciative of the opportunity to improve a cognitive skill.

Memory is a complicated cognitive process that can begin to be explained through the information processing model (Atkinson & Shiffrin, 1968). There are three main types of memory consisting of sensory memory, short-term memory, and long-term memory. First, a stimulus has to capture our attention in order for the person to bring it into consciousness. This is an example of the use of sensory memory. In short-term memory, the information is encoded and proceeds to a storage area in the brain. If the information is successfully stored, then this information can later be retrieved from long term memory (Kalat, 1986).

Two ways of retrieval are free-recall and recognition. Free-recall forces one to recreate information without external cues such as naming the state capitals. People generally excel more at a recognition task than a free-recall task due to reminders, also known as retrieval cues, such as picking state capitals from a list. Aging adults frequently use external devices as reminders, but internal strategies can also be used to aid in memory performance.

There are several strategies one can apply to improvement of memory performance. Taking more time with an activity, concentrating, simplifying the task, and arranging better conditions through elimination of distractions are a few of these strategies. More specific strategies employed are called mnemonics. Mnemonics include rhymes, acronyms, using imagery in familiar locations known as method of loci, and using a list of simple words rhyming with numbers one through ten as ‘pegs’ in the peg-word method. New words are then visualized with the peg-word in order to remember a list of up to 10 items (Kassin, 2001).

Music can also be used as a mnemonic to improve memory. Musical mnemonics are an example of how music therapy can enhance another modality by using music to meet a non-music goal. Davis, Gfeller, and Thaut (1992, p. 6) state that “Music is used as a medium to help people maintain or improve skills in the areas of communication, academic performance, gross and fine motor development, social skills, and emotional development.” Music can also be explained through the ten functions of music identified by Merriam (1964) which will be further discussed. One of these functions is aesthetic enjoyment. Familiar music is frequently aesthetically pleasing because it is previously known material.
In music therapy, recall of other material can be facilitated by using familiar melodies. A list can be set to a familiar song to remember the entire list in that order. An example of this is when children sing their alphabet to the tune of Twinkle, Twinkle, Little Star (Seamon, 1980). By using the previously known material (familiar music) and linking it to new information (e.g. the alphabet), the information is more likely to be remembered at a later date. Aging adults also seem to respond positively in activities that involve familiar music, and sometimes those who rarely speak will surprisingly sing along. Aging adults with dementia who could not remember names of their children have even been found to sing all the words to a familiar song (Prickett & Moore, 1991).

Familiar music has not, however, been researched very often on its effects on face-name recall. Without music, some face-name recall strategies include asking the name to be repeated, mentally rehearsing the name, and associating the name with a cue such as a specific facial feature. With music therapy, names can be sung to music to aid in recall. There is very little research involving music with face-name recall, therefore, the purpose of this study is to examine the effects of familiar music, unfamiliar music, and no music on face-name recall in aging adults.
Aging is inevitable. A great deal of knowledge can be gained with age, but aging can also affect people physically and mentally. Researchers have found that mental decline exists with age (Crook & West, 1990; Drachman & Leavitt, 1972: Ferris, Crook, Clark, McCarthy, & Rae 1980), particularly within the memory processes of encoding, storage, and retrieval. In order to study those processes, a basic understanding of memory is needed. The main sections of this review will include: (1) memory functions; (2) memory problems; (3) memory performance in aging adults; and (4) music therapy interventions.

**Memory Functions**

The three types of memory are sensory memory, short-term memory (STM), and long-term memory (LTM). Our sensory memory retains exact replicas of observed stimuli for up to three seconds, even though most of this information never reaches our consciousness. Two types of sensory memory are iconic and echoic memory. Iconic memory retains visual images for approximately one-third of a second. An example is when a flashlight is shown at a wall and moved quickly in a circular fashion. Iconic memory allows a continuous circle to be seen even though the light is only in one place at a time. Echoic memory, however, retains audio input for two to three seconds. An example is when a radio is turned off, a brief echo of the sound seemingly lingers (Kassin, 2001, p. 213). If the stimulus engages our attention through iconic or echoic memory, the brain instantaneously encodes the information into a form which is storable in short-term memory.
Short-Term Memory

An average person’s STM can accommodate approximately seven items (Miller, 1956). If more information needs to be learned, then one can group together chunks of the needed information (Kassin, 2001, p. 215). Storage capacity will remain the same, but one can increase storage efficiency if one increases the ability to chunk (Kalat, 1986). The duration of STM is also limited. To retain information for longer periods of time, rehearsal can be used. The two types of rehearsal are maintenance rehearsal and elaborative rehearsal. Maintenance rehearsal can be applied if one would like information to stay in STM for a longer period of time. Also known as repetition, maintenance rehearsal studies use distractions purposely made to prevent repetition. Peterson and Peterson (1959) indicated that three seconds following the stimulus information, recall of information was 80 percent, but recall fell below 10 percent after only 18 seconds. If it is necessary to transfer information to LTM, then elaborative rehearsal should be utilized.

Long-Term Memory

Elaborative rehearsal involves linking old material in LTM with new material that is thought of with more significance. According to the encoding specificity principle, it is more likely to retrieve new material thereafter because it was encoded with the old material (Thompson & Tulving, 1970). The material can then be stored in either semantic form or visual form, also known as episodic form. General meanings of verbal information, rather than exact words heard, are stored in semantic form, whereas concrete images and childhood memories are contained in visual form. Both forms are stored in LTM as procedural memory or declarative memory. Procedural memory is the stored knowledge of any skill, such as tying shoelaces, playing an instrument, and riding a bike. Declarative memory, also known as fact memory, consists of learning facts such as words, dates, names and faces (Kassin, 2001).

Memory Problems

When attempting to retrieve a specific word and resulting in failure, one realizes a decline in memory exists. To explore the origin of this decline, research has focused on the three processes of memory which are encoding, storage, and retrieval. Encoding is when a stimulus is interpreted and a replica of that interpretation is then stored (Seamon, 1980). If encoding is accomplished, then the to-be-remembered material is stored. Upon successful encoding and storage,
material can later be retrieved. Many researchers attribute memory problems to encoding and storage, but all three processes of memory have all been held responsible at one time or another (Bowles & Poon, 1982; Bromley, 1990; Drachman & Leavitt, 1972; Ferris et al., 1980).

**Encoding Stage**

Some researchers say the fault lies in the encoding stage (Bowles & Poon, 1982; Bromley, 1990). Due to the fact that names seem difficult to remember and encode, researchers have been searching for a plausible reason and remedy. One such study by Cohen (1990) concentrated on comparing names, nonsense words, occupations, and possessions. When nonsense words were substituted for a possession, the researcher found that ease of recall for names was equivalent for recall of nonsense words. When real possessions were used instead of nonsense words, the possessions were recalled better than names. These findings reveal that names are thought of as meaningless words. Possessions and occupations are more meaningful because they can usually be imagined. Some participants reported imagining the given person in their occupation along with their possession, but names were not in that imagery. If names were meaningful, they would be remembered as well as occupations as long as the name does not conflict with the other given information. McWeeny, Young, Hay, and Ellis (1987) stated in their study that occupations were always easier to recall than names even when someone had a last name that could also be labeled as an occupation (e.g., Mr. Baker).

Although occupations were not found to be distinctive enough to remember names, some research has been conducted on distinctiveness and attractiveness when encoding faces. Attractiveness is a personal judgment determined by looking at the person’s different facial features, hair, and perhaps skin discolorations such as freckles, pimples, or scars. Wickham and Morris (2003) used two measures of distinctiveness. The traditional measure consisted of the ease of detecting the face in a crowd. The deviation measure consisted of the deviation from the average face. Therefore, depending on personal judgment, a face could be distinctive in one measure, yet typical in the other measure. When faces were rated as unattractive, they were not considered distinctive. When faces were rated as highly attractive, they were not rated as distinctive, either. Researchers concluded that attractiveness was not seen as distinctive, therefore did not aid in the process of encoding faces.
Storage Stage

Once an item has been successfully encoded, problems could occur at the storage stage. Interference while attempting to store a memory could be one reason for an impairment at this stage. There are two categories of interference, proactive and retroactive. Proactive interference is when old information disrupts the mind from recalling new information, such as when learning a set of words. The task will be more difficult if another set of words was recently learned. A general example of this would be when attempting to remember if the iron was unplugged before leaving the house. If ironing if frequently done, a recollection of a previous time in which the iron was unplugged might resurface even if the iron was not unplugged (Kalat, 1986; Kassin, 2001).

Retroactive interference, however, is when new information interrupts recall of old information. Reductions in retroactive interference were researched comparing children in the second grade with children in the fourth grade. Researchers presented two lists of toys, but the second list could also be categorized, and therefore recoded as vehicles. Some children were not told of the second classification, and some were told after the lists were read, or directly preceding the retention test. The younger children were found to have reduced retroactive interference provided the recoding instructions were given immediately after the lists were read. The older children, however, were able to successfully reduce retroactive interference either occasion recoding instructions were given (Howe, 2004).

Retrieval Stage

Arenberg (1980) states that retrieval is contingent upon adequate encoding. Information first must be encoded and then stored to allow retrieval. In order to isolate retrieval from the other two stages, the conditions need to be manipulated at the time of the test. Comparing recall with recognition or cued recall with free recall are two ways in which a retrieval problem might be reflected by a person’s performance (Smith, 1980). When comparative analyses on recognition and recall were run on data collected in a study by Schonfield and Robertson (1966), there was no difference in recognition between young and old subjects. However, results showed a definite decline in older subjects’ recall scores compared to younger subjects.

Recall and recognition were also compared in a study using negative, positive, and neutral images with young, middle-age, and older adults (Charles,
Mather, & Carstenson, 2003). During the recall task, positive images were recalled more often than negative images by both the middle-age and older adults. Younger adults’ recall amounts were nearly equal for positive and negative images. During the recognition task, middle-age and older adults recognized approximately the same amount of positive and negative images while younger adults accurately recognized a greater number of negative images. Younger adults, as well as older adults, spent more study time encoding the negative images, so the amount of attention did not explain age differences. It appears that when retrieving, less negative than positive information is recalled as one ages.

Cued recall versus free recall has also been compared across age groups. Cued recall using only structural cues, the first letter of each test word, was employed by Drachman and Leavitt (1972) and enhancement of the study was later done by adding semantic cues (categorical labels). Results showed that there was very little age difference when semantic, not just structural cues were provided. In fact, when semantic cues were given upon input of information, the age effect was eliminated altogether (Smith, 1977). Therefore, an effective retrieval plan could begin with semantic coding upon input for each list item which supports the encoding specificity principle previously mentioned.

Free recall has also been examined via the list of to-be-remembered item’s serial position. There are three segments to serial position consisting of the primacy, recency, and the asymptote segments. The asymptote (middle section) is not as frequently studied, which may be as a result of the many factors that influence that segment (Smith, 1980). Primacy and recency effects are frequently discussed when serial position is mentioned (Jones & Sieck, 2003). Primacy is an improved memory for the first item in a list. Recency is an improved memory for the last, which would be the most recent item on the list. When attempting to remember four names in a group consisting of William, Terry, Laura, and Clarence, the name William would likely be remembered due to primacy. The name Clarence would be remembered more so than the middle two names due to recency. When Smith (1991) studied serial position for songs, all groups were proficient at recalling lyrics from the beginning phrases (primacy) or the ending phrases (recency) regardless of the familiarity of the piece. In another study involving music, researchers found serial position effects in sets of pure tones (Mondor & Morin, 2004). These pure tones, which contain only one frequency
each, were put in sets of three and the first and last tones were remembered more often than the middle tone. Only three tones were used in each set to prevent the tones being perceived as a pattern or melody. It was hypothesized that if the tones formed a pattern, that set might be more likely to be remembered. Although no such evidence was found, tones could be influenced by patterns in different circumstances. So when attempting to identify if the retrieval, storage, or encoding stage is the source for the age impairment, an agreement will likely never be decided upon due to many contradictions in the research (Salthouse, 1980).

**Memory Performance in Aging Adults**

Several studies have stated that when aging adults spoke of a decline in memory, difficulty recalling names was prevalent (Broadbent, Cooper, Fitzgerald, & Parkes, 1982; Bromley, 1990; Cohen & Faulkner, 1986; Martin, 1986). When older subjects were tested, Crook and West (1990) found that name recall ability does decline over the years in everyday circumstances. Compared with younger subjects, older subjects recalled fewer names (Cohen & Faulkner, 1986; Martin, 1986). When Cohen and Faulkner (1986) separated the older subjects into two groups, those over age 70 remembered fewer names than the group consisting of those 60 to 70 years of age. All age groups were significantly better at recalling names for common nouns such as locations, occupations, and hobbies than recalling peoples’ first and last names. A plausible explanation for the problem is that names of people lack the semantic associations that are contained in common nouns (Cohen & Faulkner, 1986).

When retrieval difficulty arises, partial information about the target person may be remembered, such as people who share similar physical traits or who are usually encountered in the same setting. When this occurs, individuals that are retrieved are described as *descriptive candidates* (Cohen & Faulkner, 1986, p. 191). When aging adults remembered partial information, descriptive candidates were described significantly more than *phonological candidates*. Phonological candidates matched phonological attributes of the target name such as a similar sound, the same first letter, or the same number of syllables. Older adults, however, reported more name blocks when absolutely no information came to mind. Blocks did not occur often when the target person was present, but actually when attempting to think or speak about the target person. Although face-name
recall has been shown to decline with age, Martin (1986) found that with particular tasks, such as remembering appointments, recall improved with age.

**Increasing Memory Performance**

Aging adults have been found to recall material just as efficiently as younger adults. The key is to have appropriate material for each age group. In a study by Barrett and Wright (1981), this took place by having two different lists. One list contained words which were commonly used by aging adults aged 63 through 75 (i.e. davenport, victrola, and bloomers). The other list consisted of words which were used by younger adults aged 18 through 24 (i.e. bummer, dude, and bell bottoms). If the study were conducted today, the young list might consist of words such as **cell** or **internet**. Aging adults displayed a recall deficit only when recalling the young list. Even when young adults were given longer study time, more words on the older list were recalled by aging adults than by younger adults. The results clearly show that word familiarity should be considered when comparisons are made between younger and older adults.

When aging adults were quite active physically and socially, they reported fewer everyday memory problems (Jennings & Darwin, 2003). When health was self-rated as poor, aging adults scored lower on memory tests than those whose health self-rating was good. These results indicate that an aging adults’ cognitive function can be influenced by many health factors (Jeclic & Kempen, 1999). When aging adults believed controllable factors such as motivation and level of mental activity were responsible for memory problems, they tested better on various sections of memory tests than participants who did not hold that belief. Fewer everyday memory errors occurred in aging adults who attributed their memory problems to a lack of strategy. When age was blamed, however, they reported more errors in everyday memory. These results show a correlation between beliefs and cognitive performance (Jennings & Darwin, 2003).

Aging adults can improve their cognitive performance when motivated to do so and also by reorganizing their surroundings (Langer, Rodin, Beck, Weinman, & Spitzer, 1979). Memory performance can be improved and maintained following training (Scogin, Storandt, & Lott, 1985). These results show that if given proper structure, aging adults could benefit from self-taught programs of memory training. Aging adults were found to rarely mention using memory aids; therefore, learning memory strategies may be the answer to remembering names as well other information (Cavanaugh, Grody, & Perlmutter, 1983).
Memory Strategies

Memory strategies are employed each day when people set their alarm clocks to ensure waking at a certain hour. Clocks are just one example of an external apparatus used to facilitate memory because it acts as a cueing device. Other cueing devices include placing a to-be-remembered object in a noticeable place, asking a friend to remind them, and even tying a string around a finger (McEvoy, 1992). Preparing a shopping list, taking notes, making a recording, or taking a picture are other means of external aids (Wilson, 1993). When concentration or elaboration take place, however, the memory aids are internal (Cavanaugh, Grady, and Perlmutter, 1983).

Mnemonic techniques are internal “strategies that can be used to enhance the acquisition and retention of information” (Rybash, Hoyer, & Roodin, 1986, p. 97). The use of mnemonic techniques dates back to the ancient civilizations of the Greeks and Romans. When people in that era were required to remember substantial amounts of information for speeches, they found the techniques to be highly effective (Seamon, 1980). Two types of general mnemonics frequently mentioned are the organizational mnemonics and the encoding mnemonics. When new information is mentally placed, relating it with old information is called an organizational mnemonic. The method of loci, pegword, and story methods are all examples of this type of mnemonic and will be discussed later. Encoding mnemonics, however, are used to transform abstract material into an image so that an organizational mnemonic can then aid in the information’s storage process (Bellezza, 1987).

Categories of internal mnemonics also include verbal and visual mnemonics. Verbal mnemonics include acronyms, the story method and rhyming. Acronyms are when the initial letters of to-be-remembered information is converted into a word or sentence. The notes on the lines of the treble clef in music notation are EGBDF possibly meaning ‘Every Good Boy Does Fine’. The story method is where one creates a story with the information to be remembered, correlating the first item with the second, the second with the third, and so on (Wilson, 1993). Rhyming mnemonics have been used in English grammar (e.g. I before E, except after C) and when breaking down the alphabet into smaller, easy to retain, chunks during the alphabet song (Seamon, 1980).

Rhyme also comes into play with the organizational mnemonic called the peg-word method, which is also a visual mnemonic. First, a rhyme scheme is
learned such as *one is a bun, two is a shoe*, and those words become the *pegs* (Kassin, 2001; Seamon, 1980). Then, using relational imagery, each peg is visualized associating with the image of the object (e.g. associating a stick of butter in a hot dog bun). Many sources also speak of the method of loci as a visual mnemonic (Kassin, 2001; Rybash, Hoyer, and Roodin, 1986; Seamon, 1980). The method of loci also breaks down information into smaller chunks by imagining walking through a familiar place or building (i.e. loci). Using the objects envisioned on the way, subject matter needed to be recalled is connected with each of the objects (Seamon, 1980). A similar strategy called the keyword method was later discovered to aid in learning foreign languages. A *keyword* in the native language is chosen that sounds similar to partial or the entirety of the foreign word and then form an image with the native language translation. An example of this is when the Russian word *gora* is translated to the English word *mountain*. Part of the English word *garage* sounds like the foreign word, so a mountain packed inside of a garage is then visualized (Kausler, 1994).

Researchers have found that the keyword method increased recall of English translations when foreign words were given (Pressley, Levin, Hall, Miller, & Berry, 1980).

The keyword method was later adapted to assist in face-name recall. The components needed are a pronounced facial feature and part of the person’s name that can be visualized as an object. When the two components are correlated into an image, the face-name mnemonic can be effective (McCarty, 1980). When aging adults were instructed to judge the formed images as pleasant or unpleasant, researchers found the adults’ recall of face-name associations increased (Yesavage, Rose, & Bower, 1983).

**Music Therapy**

When judging an image, place, or piece of music as pleasant or unpleasant, this is a personal perception. When deemed pleasant, the item can be perceived as aesthetically pleasing. Merriam (1964) identified aesthetic enjoyment as one of the ten functions of music which are as follows: “1) emotional expression, 2) aesthetic enjoyment, 3) entertainment, 4) communication, 5) symbolic representation, 6) physical response, 7) enforcing conformity to social norms, 8) validation of social institutions and religious rituals, 9) contribution to the continuity and stability of culture, 10) contribution to the integration of society” (Merriam, 1964, p. 223-227). The term *aesthetic*
denotes the value or meaning of various forms of art. Aesthetic feelings may occur when a personal response for beauty stimulates an aesthetic experience (Radocy & Boyle, 2003).

Aesthetic enjoyment is viewed from the listener, as well as the creator, of the music (Davis, Gfeller, & Thaut, 1992). When a familiar song is heard, former associations may be rekindled and the piece might be identified as highly aesthetic by that individual. On the other hand, unfamiliar music could also be aesthetically pleasing if the individual participates in songwriting. A song that began as unfamiliar parts becoming a whole, then becomes a familiar song. In fact, professional music therapists utilize familiar music in a number of settings (Gfeller, 1983; Martin, 1994; Moore, Staum, & Brotons, 1992; Wigram, Pederson, & Bonde, 2002; Wolfe & Hom, 1993).

**Music Therapy Interventions for Increased Memory Performance**

For a number of years, researchers have found music therapy to be an effective treatment for the geriatric population (Clair, 1996; Millard & Smith, 1989; Prickett & Moore, 1991; Smith & Lipe, 1991; Wigram, Saperston, & West, 1995). It is hard to generalize with this population, however, due to their wide spectrum of differences. Aging adults suffer from many levels of hearing and vision loss to strokes, Parkinson’s, and heart disease. Many aging adults have grown wise over the years, live independently, and are able to live happy, healthy lives. Unfortunately, many suffer from forms of dementia and need care with everyday tasks, and deficits of communication and memory (Wigram, Pederson, & Bonde, 2002). Fortunately, while some therapeutic endeavors are ineffective, the dementia population responds well to music. When individual music therapy sessions are applied with those suffering from Alzheimer’s Disease, researchers have found there to be an increase in positive responses, participation, verbal feedback, smiling, and eye contact. These positive behaviors then transfer to group activities (Pollack & Namazi, 1992).

Familiar music is also recommended as part of an effective music therapy intervention as it is more likely to promote initial participation via singing, clapping, and tapping feet as well as evoke positive memories (Clair, 1996). When using familiar music, aging adults recall a greater percentage of lyrics than when using less familiar songs (Smith, 1991). Enhancement of learning through familiar music was also found when children were learning phone numbers. The numbers set to familiar music were learned more proficiently than those set to
unfamiliar music (Wolfe & Hom, 1993). When comparing familiar and unfamiliar songs with familiar words and an unfamiliar poem, aging adults recalled the lyrics to the familiar songs most accurately. Lyrics to all songs, though, were recalled better than any of the spoken words (Prickett & Moore, 1991).

Songwriting is another music therapy intervention used with aging adults. Songwriting allows feelings to be creatively narrated, encourages life review, and provides opportunities for making artistic choices. The ten functions of music include emotional expression. When songwriting is implemented, feelings of grief, sadness, love, joy, or fright can be expressed. Any emotion can be set to music to communicate ideas that otherwise might be unexpressible (Merriam, 1964). Sometimes this expression is experienced by a single person humming while at work, or by a group of people working together toward a common goal. Once songs are written and have musical accompaniment, then lyrics are quickly learned and retained. The music is the mnemonic to help those with memory difficulties (O’Callaghan, 1997).

Mnemonics aid in the encoding and organization of information and in music, gestalt is the organization of parts making a whole. As mentioned earlier, material can be chunked together in order to remember a whole set of information. Separate tonal occurrences can form patterns when laid out in a series. Within gestalt, there are organizational principles of proximity, similarity, common direction, simplicity, and closure that are followed. The principle of proximity mentions objects sharing attributes may be grouped together. Musically, short distances between a melody’s consecutive notes arise more often than large intervals, providing a unification of notes in the melody (Lipscomb, 1996). The unification of notes is the melodic contour which frequently assists in remembering certain melodies and having them become familiar.

Familiar music was not found to have been previously compared with unfamiliar music along with face-name recall. Although little research has been done, in general, with face-name recall and music, Carruth (1997) found music therapy to be a viable intervention for face-name recall with aging adults who were experiencing memory loss. To test those adults, the spaced-retrieval technique was used along with music. The spaced-retrieval technique is when the subject is tested on their recall beginning with very short intervals of just several seconds to longer intervals of minutes and hours. The names and brief
descriptions of nursing home staff were set to music to aid patients afflicted with Alzheimer's Disease's recall of the people who took care of them. Five of the seven participants had successful face-name recall of the staff member targeted when the spaced-retrieval technique was used with music. Carruth’s (1997) study was most closely related to the present study, however she did not examine the effects of the independent variables familiar and unfamiliar music. Therefore, the purpose of this study is to examine the effects of familiar and unfamiliar music as well as no music to aid in face-name recall in aging adults. The research questions are:

1. Do names set to familiar music elicit a greater number of recognition and recall responses in aging adults than names set to unfamiliar music or no music?

2. Does the level of a participant’s formal education affect the number of recognition and recall responses in aging adults?

3. Does age have an effect on the number of recognition and recall responses?
CHAPTER III

METHOD

Participants
Following solicitation by the researcher, 60 adults over the age of 60 participated in the study. Criteria for participants were:

1. No evidence of dementia
2. Ability to see 5” x 7” pictures at two feet with or without glasses
3. Ability to hear music at typical listening level
4. Ability to answer questions verbally

Participants were ages 62 through 94 years, with 81.6 years being the average age. There were 10 male and 50 female participants; 38 lived in assisted living facilities and 22 lived independently. Detailed subject demographics are presented in Appendix C.

Setting
All sessions took place where the subject deemed most comfortable. This varied with each participant, but each session was held where there would be no disturbances. If the participant lived in an assisted living facility, the session was held in the participant’s room or a small, quiet lobby area. If the participant was independent, the session was usually held in the participant’s home, at their kitchen table or in their living room. When possible, the researcher and participant faced one another for the session. Proximity between the researcher and participant was approximately two to four feet and was determined by the participant’s visual ability.

Design
A posttest only design was used in this study, with one control (no music) and two treatment conditions (familiar music and unfamiliar music). Twenty participants were randomly assigned to each group; the control group and the two
treatment groups. The three dependent measures consisted of a free recall test, a recognition test, and a face-name recall test. All participants were administered the three posttests.

Independent Variables

Treatment one: Familiar Music Condition. In order to choose the familiar song, a list of popular songs was compiled by referencing several song books and research with aging adults (Agay, 1975; Hackett, 1998; Jonas, 1991). From this list, Oh Susanna was chosen as the familiar song for the following reasons (see Appendix D). Stephen Foster is the composer and was known as ‘America’s first truly great songwriter’ (Agay, 1975, p. 52). This song sometimes falls into the country music category which is supported by Jonas (1991) who found that aging adults preferred country selections. Also, the melody and meter allowed the names to be easily sung along with the music.

Names were set to the familiar music as corresponding faces were shown. Participants were invited to sing along as the song was sung three times. Recorded keyboard accompaniment was simultaneously played on an audio tape player.

Treatment two: Unfamiliar Music Condition. The researcher composed a simple song without lyrics for the unfamiliar music condition (Appendix E). Names were set to unfamiliar music as corresponding faces were shown. Participants were invited to sing along as the song was sung three times. Recorded keyboard accompaniment was simultaneously played on an audio tape player.

Control Group: No Music Condition. Names were spoken at the same speed as if set to a song as corresponding faces were shown. Participants were invited to speak the names along with the researcher as the faces were shown three times.

Dependent Variables

Free Recall Posttest. This was the first test given and consisted of participants being asked to recall as many names as possible without the aid of faces.

Recognition Posttest. Participants were asked to select the correct face from a closed response set of three faces when given a name. The researcher verbalized which face was chosen (left, right or middle) in order to audio record the participants’ response.
Face-Name Recall Posttest. Participants were asked to recall the correct name for each face, alternating between male and female faces.

Materials

Faces used in this study were of aging adults whom the researcher knew were highly unlikely to be known by participants (see Appendix F). These adults reside in a different state and/or facility. Pictures were taken by the researcher with a digital camera and then printed on glossy paper with a color printer. All eight pictures measured approximately 5” x 7” and were then attached to 6.5” x 10” sheets of black poster board. Two holes were punched on the left side of the sheets of poster board and two detachable rings were inserted. This enabled the researcher to flip through the faces like book pages and so that sheets could be separated for the posttests.

Names were chosen from lists of popular baby names from the decades of 1910 through 1940 found on the internet (Babycenter.com). Names from this time period were chosen in order to share age commonality with the faces as well as to the study participants. The eight names selected from these lists were then matched by using only two-syllable names with the accent on the first syllable. Names were laminated and attached with velcro below the faces so they could be easily removed for the posttests.

Procedure

Recruiting participants. Some participants resided in assisted living facilities in Tallahassee, Florida and Mount Vernon, Ohio. The activities director of each facility was contacted and the nature of the study was explained. The researcher went to each facility at an appointed time and the activities director then made a list of residents who fit the criteria, spoke of declarative memory problems, and would possibly consent to the study. Depending on the activity director’s available time, the resident list was either just given to the researcher with brief, verbal descriptions about the people, or the activities director would introduce each resident on the list. The researcher then knocked on residents’ doors, introduced herself and had the resident sign the consent form if the resident agreed to the study.

Other participants lived independently and there were two ways in which the researcher found these participants. One way was to contact the activity directors of independent living complexes that were associated with nearby assisted living facilities. If the complex had arranged activities, a certain activity
would be suggested as one to visit. With this population, however, the researcher would arrive near the end of a given activity and present the content and goals of the study to ask for volunteers. For those who agreed to the study, the consent form was given and an appointment made.

*Math therapy intervention procedure.* The researcher introduced herself and briefly explained the study. The participant was then asked to read and sign the consent form which further explained the study. The form also mentioned that the session would be audio taped so that neither researcher nor participant would be required to write answers. The researcher then answered the participants’ questions, if any, and requested demographic information. There was brief small talk as the researcher set up the tape recorder and placed it close to the participant. The tape player, if needed for that condition, was set near the researcher. Each session lasted approximately twenty minutes as mentioned in the consent form. The participant was then given one of the conditions explained previously; either familiar music, unfamiliar music or no music.

*Posttest procedures.* After the condition, the participant was given all three posttests, explained under dependent variables.

**Data Analysis**

To calculate the number of correct answers for the posttests, the researcher listened to the audio tapes containing participants’ verbal responses and counted the number of correct responses under all conditions. The data were then analyzed using a one-way ANOVA.
CHAPTER IV
RESULTS

This chapter includes analyses of the participants’ posttest scores. Participants’ scores were analyzed on the basis of the three independent variables (familiar music, unfamiliar music, and no music), gender, age, home environment (assisted living facility or independent living), musical experience, and formal education.

Research Question 1. Do names set to familiar music elicit a greater number of recognition and recall responses in aging adults than names set to unfamiliar music or no music?

Table 1 shows the mean number and standard deviations of the three posttest scores when participants were given names spoken, with unfamiliar music, or with familiar music. The information from Table 1 was also analyzed using a one-way ANOVA to determine any statistical significance ($p < .05$) among the control group and the two treatment groups. No significant difference was found among the posttest scores between groups. See table 2. These data indicate that although the familiar and unfamiliar music treatment conditions yielded equal or higher mean scores from participants than the control group, no significant difference was found.
Table 1

Means and Standard Deviations by the Independent Variables

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Score # 1</th>
<th>Score # 2</th>
<th>Score # 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Spoken</td>
<td>4.90</td>
<td>1.410</td>
<td>5.00</td>
</tr>
<tr>
<td>Unfamiliar Music</td>
<td>5.50</td>
<td>1.318</td>
<td>5.00</td>
</tr>
<tr>
<td>Familiar Music</td>
<td>5.70</td>
<td>0.801</td>
<td>5.05</td>
</tr>
</tbody>
</table>

Table 2

ANOVA Results Between Condition Groups

<table>
<thead>
<tr>
<th>Posttest Score</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td># 1</td>
<td>6.933</td>
<td>2</td>
<td>3.467</td>
<td>2.381</td>
<td>.10</td>
</tr>
<tr>
<td># 2</td>
<td>.033</td>
<td>2</td>
<td>.017</td>
<td>.005</td>
<td>.99</td>
</tr>
<tr>
<td># 3</td>
<td>2.800</td>
<td>2</td>
<td>1.400</td>
<td>.319</td>
<td>.72</td>
</tr>
</tbody>
</table>

The Pearson product-moment correlation test was used to analyze posttest scores in order to determine the relationship between scores. The correlation coefficients “can take on values from -1.00 to +1.00, where the absolute magnitude provides an index of strength of the relationship between the two variables and the sign indicates the direction of the relationship” (Shavelson, 1981, p. 158). A significant positive correlation (0.712) was found between participants’ scores on the second and third posttests. Table 3 shows the correlation between scores.
Table 3

*Pearson Correlation Between Scores*

<table>
<thead>
<tr>
<th>Posttest Score</th>
<th>Score # 2</th>
<th>Score # 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants (n = 60)</td>
<td></td>
<td></td>
</tr>
<tr>
<td># 1</td>
<td>.280</td>
<td>.299</td>
</tr>
<tr>
<td># 2</td>
<td>-</td>
<td>.712</td>
</tr>
</tbody>
</table>

Figure 1 shows the linear relationship of the two posttest scores in a scatter plot. These data indicate that scores of the second and third posttests had a strong relationship.

Figure 1. Scatter plot of Correlated Posttest Scores
Research Question 2. Does the level of a participant’s formal education affect the number of recognition and recall responses in aging adults?

Table 4 shows the mean number and standard deviations of the three posttest scores when formal education of participants were compared. A one-way ANOVA was then used to determine any statistical significance ($p < .05$) among the education groups. Table 5 shows no statistical significance was found among the posttest scores between groups. Mean scores indicate that although no significant difference was found, participants who had education beyond a bachelor’s degree (PG) scored higher than participants of all other education levels on the first posttest. The participants who did not complete a bachelor’s degree (SC) possessed mean scores higher than participants of all other education levels on the second and third posttests.

Table 4
Means and Standard Deviations by Formal Education

<table>
<thead>
<tr>
<th>Education</th>
<th>N</th>
<th>Score # 1</th>
<th>Score # 2</th>
<th>Score # 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
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<td>HS</td>
<td>20</td>
<td>5.05</td>
<td>1.050</td>
<td>4.80</td>
</tr>
<tr>
<td>SC</td>
<td>12</td>
<td>5.33</td>
<td>0.888</td>
<td>5.75</td>
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<tr>
<td>CG</td>
<td>14</td>
<td>5.43</td>
<td>1.453</td>
<td>4.86</td>
</tr>
<tr>
<td>PG</td>
<td>14</td>
<td>5.79</td>
<td>1.477</td>
<td>4.86</td>
</tr>
</tbody>
</table>

Note. HS = High School graduate or less than High School; SC = some college completed; CG = college graduate; PG = post graduate work.
Table 5
ANOVA Results Between Education Groups

<table>
<thead>
<tr>
<th>Posttest Score</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td># 1</td>
<td>4.531</td>
<td>3</td>
<td>1.510</td>
<td>.990</td>
<td>.40</td>
</tr>
<tr>
<td># 2</td>
<td>8.105</td>
<td>3</td>
<td>2.702</td>
<td>.827</td>
<td>.48</td>
</tr>
<tr>
<td># 3</td>
<td>6.740</td>
<td>3</td>
<td>2.247</td>
<td>.511</td>
<td>.67</td>
</tr>
</tbody>
</table>

Research Question 3. Does age have an effect on the number of recognition and recall responses in aging adults?

The mean number and standard deviations of the three posttest scores when participants’ ages were compared are given in Table 6. A one-way ANOVA was then used to determine any statistical significance (p < .05) among age groups. Table 7 shows a statistical significance was found between age groups on the scores of the third posttest. Once a significant difference was found, a Scheffé post-hoc analysis and a Duncan post-hoc analysis were both run on the data (see Table 8). The Scheffé post-hoc analysis showed that those aged 90 and above scored lower than those 70 to 79 years of age. The Duncan post-hoc analysis, however, showed that those 90 and above scored lower than all other age groups.
### Table 6

*Means and Standard Deviations by Age*

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Score # 1</th>
<th></th>
<th>Score # 2</th>
<th></th>
<th>Score # 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Score</td>
<td>M</td>
<td>SD</td>
<td>Score</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td></td>
<td># 1</td>
<td># 2</td>
<td># 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-69</td>
<td>8</td>
<td>5.25</td>
<td>5.00</td>
<td>3.88</td>
<td>1.282</td>
<td>1.852</td>
<td>2.416</td>
</tr>
<tr>
<td>70-79</td>
<td>12</td>
<td>5.67</td>
<td>5.58</td>
<td>4.42</td>
<td>1.155</td>
<td>1.443</td>
<td>2.021</td>
</tr>
<tr>
<td>80-89</td>
<td>28</td>
<td>5.43</td>
<td>5.21</td>
<td>3.61</td>
<td>1.289</td>
<td>1.893</td>
<td>1.950</td>
</tr>
<tr>
<td>90+</td>
<td>12</td>
<td>5.00</td>
<td>4.00</td>
<td>1.83</td>
<td>1.206</td>
<td>1.651</td>
<td>1.337</td>
</tr>
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</table>

### Table 7

*ANOVA Results Between Age Groups*

<table>
<thead>
<tr>
<th>Posttest Score</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td># 1</td>
<td>2.190</td>
<td>3</td>
<td>.970</td>
<td>.624</td>
<td>.60</td>
</tr>
<tr>
<td># 2</td>
<td>17.352</td>
<td>3</td>
<td>5.784</td>
<td>1.866</td>
<td>.14</td>
</tr>
<tr>
<td># 3</td>
<td>44.713</td>
<td>3</td>
<td>14.904</td>
<td>4.010</td>
<td>.01*</td>
</tr>
</tbody>
</table>

*p < .05*
Table 8
Scheffé and Duncan Post Hoc Analyses

<table>
<thead>
<tr>
<th>Analysis Group</th>
<th>N</th>
<th>1</th>
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</tr>
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<tbody>
<tr>
<td>90+</td>
<td>12</td>
<td>1.83</td>
<td>-</td>
</tr>
<tr>
<td>80-89</td>
<td>28</td>
<td>3.61</td>
<td>3.61</td>
</tr>
<tr>
<td>60-69</td>
<td>8</td>
<td>3.88</td>
<td>3.88</td>
</tr>
<tr>
<td>70-79</td>
<td>12</td>
<td>-</td>
<td>4.42</td>
</tr>
<tr>
<td>Sig.</td>
<td>.08</td>
<td>.78</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analysis Group</th>
<th>N</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>90+</td>
<td>12</td>
<td>1.83</td>
<td>-</td>
</tr>
<tr>
<td>80-89</td>
<td>28</td>
<td>-</td>
<td>3.61</td>
</tr>
<tr>
<td>60-69</td>
<td>8</td>
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</tr>
<tr>
<td>70-79</td>
<td>12</td>
<td>-</td>
<td>4.42</td>
</tr>
<tr>
<td>Sig.</td>
<td>1.00</td>
<td>.33</td>
<td></td>
</tr>
</tbody>
</table>

Following this test, ANOVAs were conducted comparing separately gender, home environment, and musical experience. No significant difference was found when comparing gender scores, location of home environment (assisted living facility or independent living), or musical background among the three groups. A post-hoc analysis was conducted to find the effects of serial position on posttest one. Primacy and recency effects were found with the first name in the set (primacy) being remembered 81.7 percent of the time and the last name of the set (recency) being remembered 78.3 percent of the time. Other names in the set were remembered between 50 percent and 73.3 percent of the time. These results indicate serial position may have influenced participants’ responses.
CHAPTER V

DISCUSSION

The purpose of this study was to examine the effects of familiar music, unfamiliar music, and no music on face-name recall in aging adults. Results indicated no significant difference between the groups. There was, however, an equal or higher mean score for treatments one (familiar music) and two (unfamiliar music) than for the control condition (no music), and the familiar music group yielded higher mean scores than the unfamiliar music group.

There were a few negative comments from those who, upon reading the consent form, decided not to participate. Comments included those complaining of physical ailments such as the inability to see or hear efficiently, or not feeling well at that time. Some participants stated they always had trouble remembering names and they were convinced that they would fail or ruin the results. Many participants who lived independently kept very busy schedules and simply could not find the time. Several participants in the control group made statements that they were disappointed they would not be receiving music.

Many participants’ comments were positive, stating that they loved music, listened to music often, and that several family members were involved with music. Once the study was completed with each individual, participants often stated that they enjoyed the music and thought the activity was entertaining. Participants frequently commented that the study was not as difficult as they first thought it would be. Many participants inquired more about music therapy and appeared pleased to be a part of the study.

When participants were given posttest one, there was little hesitation to state the names they remembered. Several participants quickly named the majority while others took more time with the task. Most participants appeared very certain when finished giving names, stating that all names remembered had been given. Those who took more time with the task were urged to continue to
the next test when a name had not been recalled within approximately 20 seconds. Participants were never given longer than one minute to recall names, although most completed their recall after 20 to 30 seconds. Results may have varied had there been a specific time restraint.

Posttest two consisted of the participants matching a name to one of three faces. Participants tried to engage in a process of elimination strategy by asking if a specific name had been stated. The researcher did not divulge which names were previously given or which responses were correct in order to reduce interference with participants’ responses.

When participants were given posttest three instructions, to recall the names of each face, comments and behaviors included groans and rolling of the eyes. Lower mean scores on posttest three demonstrated that face-name recall was the most difficult for participants. Many participants chose to pass over some faces because they stated that more time would not help them to remember the names.

Responses of posttest one were analyzed for effects of serial position. Primacy and recency effects were found with the first name in the set (primacy) and the last name of the set (recency) being remembered more often than other names in the set. These results support other studies where serial effects were also found. One such study by Smith (1991) shows that lyrics from the beginning and ending phrases of music were efficiently recalled regardless of the familiarity of the piece.

When age was analyzed, those 90 and above scored significantly lower than those between 70 and 79 according to the Scheffé post-hoc analysis. The Duncan post-hoc analysis indicated those 90 and above scored significantly lower than all other ages. These data also support Cohen and Faulkner’s study (1986) where age effects were found. Cohen and Faulkner reported those over the age of 70 remembered fewer names than those ages 60 to 70. This study corroborates previous research with face-name recall as well. Carruth (1997) used names and descriptions of people set to music while corresponding faces were viewed. Recall was then tested at various intervals of time which revealed improvement in face-name recall. Wolfe and Hom (1993) also found that participants recalled phone numbers more proficiently when the numbers were set to familiar music rather than unfamiliar music.
Suggestions for future research include: 1) utilizing an alternate form of posttest two - having participants select the correct name from a closed response set of three names when given a face, 2) using participant selected music for the familiar music condition, 3) using familiar and unfamiliar music to aid in the recall of persons in their living environment, and 4) having a similar number of males and females in order to compare gender differences. In this study, gender was not found to have significant differences, possibly due to the low number of males who participated. Females generally volunteer their time more often than males. In the assisted living facilities, more women were found possibly due to their longer life expectancy.

In conclusion, age was shown to be a significant factor in recall and recognition. In the aging process, memory slowly declines, but everyone has the choice to use strategies that might help with this impairment. Familiar and unfamiliar music, although not found significant, seems to enhance free recall, recognition, and face-name recall. Music may also put those who have difficulty in recalling names at ease. Familiar music can be used to make the task of recalling names more enjoyable as well.
Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2763
(850) 644-6073 · FAX (850) 644-4302

APPROVAL MEMORANDUM

Date: 5/13/2004

To:  Jara Stull
280 John Knox Rd #254
Tallahassee, FL 32303

Dept: MUSIC SCHOOL

From: John Tomkowiak , Chair

Re: Use of Human Subjects in Research
   The effects of Familiar Music, Non-Familiar Music, and No Music on Aiding Face-Name Recall in Aging Adults

The forms that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be Exempt per 45 C.F.R § 46.101(b) 2 and has been approved by an accelerated review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If the project has not been completed by 5/13/2005 you must request renewal approval for continuation of the project.

You are advised that any change in protocol in this project must be approved by resubmission of the project to the Committee for approval. Also, the principal investigator must promptly report, in writing, any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols of such investigations as often as needed to ensure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The Assurance Number is IRB00000416.

Cc: Dr. Alice-Ann Darrow
HSC No. 2004-334
APPENDIX B

INFORMED CONSENT FORM
Dear Resident,

My name is Jara Stull and I am a graduate student under the direction of Dr. Alice-Ann Darrow in the Music Therapy Department at Florida State University. I am conducting a project entitled The Effects of Familiar Music, Unfamiliar Music, and No Music on Aiding Face-Name Recall in Aging Adults.

The purpose of this project is to determine if music aids in the recall of names to faces. There will be one session with each individual which will last no longer than thirty minutes. The researcher will show one set of eight pictures of unknown faces with names printed below them as names are either spoken, set to familiar music, or set to unfamiliar music. Afterwards, participants will be asked to list names in any given order, point to faces corresponding to specified names, and also label faces with names.

Your participation in this project is voluntary. If you decide not to participate at any time before or during the project, there will be no penalty. The results of this project may be used in a future publication, but names will be omitted.

There are no foreseeable risks as a result of participation in this project. An anticipated benefit will be a more efficient way to match names with faces. Participants will be audio taped in order to provide research reliability. These tapes will be stored in a locked safe which can only be accessed by the researcher. The tapes will be kept the duration of the project, after which they will be destroyed (no later than 11/01/05). Any confidential information that is obtained during the study will remain so, to the extent allowed by law.

If you have any questions about the project, please call me at (850) 523-0978. If you have any questions regarding your rights as a participant, you may contact the chair of the Human Subjects Committee at (850) 644-8633.

Sincerely,

Jara Stull

I give my consent to participate in this project and am aware I will be audio taped.

_______________________________   __________________
Signature         Date
APPENDIX C

SUBJECT DEMOGRAPHICS
<table>
<thead>
<tr>
<th>SUB. #</th>
<th>HOME</th>
<th>SEX</th>
<th>AGE</th>
<th>EDUCATION</th>
<th>MUS. BACKGR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ALF</td>
<td>F</td>
<td>86</td>
<td>Doctorate</td>
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</tr>
<tr>
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<td>ALF</td>
<td>F</td>
<td>93</td>
<td>Bachelors</td>
<td>Yes - P</td>
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<tr>
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<td>IND</td>
<td>F</td>
<td>81</td>
<td>Masters</td>
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<td>4</td>
<td>IND</td>
<td>F</td>
<td>87</td>
<td>2.5 yrs college</td>
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**Musical Background Symbols**

P = piano  
C = choir  
CC = church choir  
S = saxophone  
O = organ  
A = accordion  
H = handbells  
D = dulcimer  
V = violin  
Cl = clarinet  
T = tuba

* denotes limited experience
APPENDIX D

FAMILIAR SONG
Oh! Susanna

Original melody by Stephen C. Foster
Adapted lyrics and accompaniment by Jane Stull
Unfamiliar Song

Jens Stull

Shirley, Charles, Florence,

Robert, Mary, Richard, Ethel, David

Stull: 1904
APPENDIX F

NAMES AND FACES
Shirley
Charles
Florence
Robert
Mary
Richard
David
REFERENCES


BIOGRAPHICAL SKETCH

Name: Jara E. Stull, MT-BC

Date of Birth: January 16, 1980

Place of Birth: Mount Vernon, Ohio

Education: Miami University
Oxford, Ohio
Major: Percussion Performance
Degree: Bachelor of Music (2002)

Florida State University
Tallahassee, Florida
Major: Music Therapy
Degree: Master of Music (2005)

Experience:
MT-BC: Big Bend Hospice
Tallahassee, Florida

Internship: Big Bend Hospice
Nov. 2003 - May 2004

Practica: Dick Howser Center
Tallahassee, Florida
May 2003 - July 2003

Big Bend Hospice
Jan. 2003 - April 2003

Tallahassee Memorial Hospital,
Long Term Care
Tallahassee, Florida
Sept. 2002 - Dec. 2002

Volunteer: Harbor Chase Assisted Living
Tallahassee, Florida