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Formation and Prediction of the Singing Perceptions of Self-Labeled Singers and Non-Singers

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UNIVERSITY OF MIAMI

FORMATION AND PREDICTION OF THE SINGING PERCEPTIONS OF SELF-LABELED SINGERS AND NON-SINGERS

By

Elizabeth Gaile Stephens

A DISSERTATION

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FORMATION AND PREDICTION OF THE SINGING PERCEPTIONS OF SELF-LABELED SINGERS AND NON-SINGERS

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The purpose of this study was to investigate predictors of self-labeled singers and non-singers’ beliefs about singing, with the additional goal of exploring a conceptualization of singing perceptions. A researcher-created *Singing Perception and Participation* survey was used to collect information about the singing perceptions of university students ($N = 171$). A factor analysis was run to determine if singing identity, singing self-efficacy, and singing attitudes of students were factors of singing perceptions. To examine common participant singing perceptions, descriptive analyses were also conducted. A multiple regression was used to determine if the independent variables of home environment, music learning environment, social comparisons, age, gender, ethnicity, and singing experiences were predictors of singing perceptions. The common levels of singing participation were reported and an ANOVA was performed to determine if singing perceptions differed due to singing experiences. Finally, open response items examined reasons for participant singing identity. Survey results revealed that the majority of participants identified themselves as non-singers ($n = 151$) with medium to low levels of self-efficacy, but overall positive attitudes toward singing. Open response items were analyzed for content and several categories emerged, with the most frequent responses referencing participant singing self-efficacy, singing experiences, and comments about the definition of the term singer. A factor analysis found singing
perceptions had two components: singing self-efficacy and singing attitude. Home environment and singing experiences were found to be significant predictors of singing perceptions. Finally, singing experiences were normally distributed across the sample, but singing perceptions differed based on the level of singing participation.
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Chapter 1

Statement of the Problem

The voice is one musical instrument that every human being carries with them throughout their life. The raw possibility for making music with the voice is nearly limitless. Around the world and throughout the centuries, mankind has found many uses for the voice. More specifically, singing has historically been one of the most common methods for music making in all cultures (Nettl, 2000; White, n.d.). Today people value singing for both entertainment and spiritual purposes. Singing is very much a part of the cultures of the world as evidenced by the amount of money spent on both popular and sacred vocal music as well as the high TV ratings of shows related to singing (C. O’Neil, 2002).

Outside of the prevalence of singing in popular culture, research reveals evidence that singing can benefit people both emotionally and physically. Studies reveal that participating in singing can positively impact the mood, attitude, and social well being of individuals (Clift & Hancos, 2001; Hills & Argyle, 1998; Kenny, 2002; Parker, 2009). In addition to the emotional benefits of singing, research has found physical benefits in singing. In one 2004 study, results indicated that individuals who participated in group singing had increased levels of the secretory immunoglobulin A, an important chemical in the immune system (Kreutz, Bongard, Rohrmann, Hodapp, & Grebe, 2004). More research is needed to definitively state that singing has physical benefits, but the current research does seem to indicate that singing benefits individuals both emotionally and physically.
Considering the historical and cultural significance in addition to the emotional and physical benefits of singing, one might assume that most people participate in singing. A number of studies, however, found that many children, adolescents, and adults did not participate in school ensemble singing (Campbell, 2010; Elpus & Abril, 2011; Hedden, 2007; Turton & Durrant, 2002). There are many reasons why people do not participate in school singing. Over the last 40 years, there are a number of studies that addressed the reasons behind participation in music.

The general consensus seems to be that lack of participation can be tied to level of parent support (Haygood, 1993; Sichivista, 2007; Warnock, 2009; Zdzinski, 2004), socio-economic status (Elpus & Abril 2011), scheduling conflicts with ensembles (Alying, 2005; Freer, 2007; Sichivista, 2003; Thornton, 1981), attitude toward the musical task (Eccles, 1983; Neil, 1998; Sichivista, 2007; Sloboda, Davidson, & Howe, 1996), as well as a dislike of a teacher or a program (Campbell, 2010; De Vires, 2010; Thornton, 1981). Individual dislike of a teacher or programs is often tied to teacher personality or a lack of musical relevancy and opportunity for self-expression (Campbell, 2010; De Vires, 2010; Thornton, 1981).

Another reason people may not participate in singing is because they are unable to sing or they believe they are unable to sing. In order to discriminate between those who cannot sing and those who think they cannot sing, it is important to be aware of the percentage of the population who cannot sing. Science recognizes the inability to sing when all physical organs are normal and healthy as a medical condition called congenital amusia or amusia. Since 1980, there have been several studies examining the percentage of the population with amusia. Research indicates that approximately 2-7% of the general
population suffers from amusia (Kalmus & Fry, 1980; Henry, 2010; Peretz, Champod, & Hyde, 2003). Baring an illness or other physical disability, it is therefore likely that about 90-95% of the general population has no documented physical condition that prevents them from singing (Peretz, Champod, & Hyde, 2003; Henry, 2010).

**General Population Singing Perceptions**

Research reporting the percentage of the general population who believe they cannot sing is sparse compared to the amount of research on the prevalence of amusia. There are a few studies, however, that have examined singing perceptions in the general population. In a 2005 research study, Cuddy, Balkwill, Peretz, and Holden surveyed 2000 university students. Approximately 340 students or 17% of the surveyed participants identified themselves as tone deaf. In a second part of the same study, the researchers selected participants \( n = 100 \) from the original sample who claimed to be tone deaf and tested their musical perception and singing ability using the Montreal Battery for the Evaluation of Amusia (MBEA). The results from the MBEA tests indicated that only 11% of the 100 self-identified tone deaf participants had scores placing them in the amusia category. Thus 89% of the 100 self-identified tone deaf participants tested, had incorrectly labeled themselves as tone deaf.

In another research study examining general population singing perceptions, Pfordresher and Brown (2007) found in surveying 1,150 general college students in Texas that 59% of those surveyed claimed they could not reproduce melodies by singing. This is a much larger percentages of participants claiming tone deafness than the 17% reported in the Cuddy et al. (2005) study. Pfordresher and Brown, like Cuddy et al., selected a small group of participants from the original sample and tested their singing
The ability. The participants in the selected small group included both people identifying themselves as tone deaf and individuals who identified themselves as singers. The researchers found that only 13% of the participants in the small test group were actually pitch poor singers. This data suggests that a large number of participants may have inaccurately labeled themselves as tone deaf.

Thus according to results of Pfordresher and Brown’s (2007) survey (N = 1000), around 59% of the population do not consider themselves to be singers. The number of self-identified tone-deaf individuals found by Cuddy et al. (2005) in a singing survey (N = 2,810) was significantly smaller at 17%. Further research on the portion of the population identifying themselves as tone deaf or poor singers is needed to clarify the discrepancies between these studies. Both studies reveal that a number of individuals who believe they cannot sing. This belief prevails even though there is no physical or psychological reason for them not to sing. The number of individuals inaccurately labeling his or herself as tone deaf is disconcerting. The main concern is that poor singing self-esteem may lead to low levels of formal singing participation, which is one of the main methods for improving singing technique (Fuchs, Meuret, Thiel, Täschner, Dietz, & Gelbrich, 2007; Maehr, 1983; Peterson, 2001; Richards, 1999).

There are additional studies regarding singing perceptions in the general population. Mizener’s (1993) study of elementary children found evidence that the measured singing ability of children did not predict confidence in their singing ability. According Mizener, children are often not good judges of their singing ability. In addition to the research with children, there are also studies concerning inaccurate singing ability beliefs in adults. Investigating a group of adult self-identified non-
singers, Wheaton (1998) found that adults were not accurate in perceiving their own singing ability. Furthermore results indicated that adults would often judge their own singing much more harshly than others. Even though all of the participants in the study were selected because they identified themselves as non-singers, the singing test indicated that the majority of participants from both identity groups could sing accurately. In general, there is a lack of research in the accuracy of adolescents and adults’ self-perception. The research that does exist, indicates that a potentially large percentage of people may have inaccurately judged themselves poor singers (Cuddy et al., 2005; Pfordresher & Brown, 2007; Wheaton, 1998).

Singing Perceptions

In examining the singing research literature, many labels and ideas have been used to describe how individuals relate to singing. There is a need to statistically classify what terms encompass a person’s relationship to singing or their singing perceptions. Haskell (1987) describes singing perceptions as “the physical and psychological experience of one’s own voice” (Haskell, 1987, p. 172). Further research by Monks (2003), conducted with adolescents identified at least five categorical ways that vocal production relates to self. This led Monks to conclude that singing perceptions are often very complex and related to self. Therefore any term used to represent individual’s relationship to singing needs to address the many ways individuals relate to singing.

A preliminary summary of singing literature suggests there may be three general areas of research regarding the relationship of singing to oneself or singing perceptions. These areas include singing self-identity, singing self-efficacy, and attitudes toward singing. For the purposes of this study, all three areas encompassing singing in relation
to ones self (sing identity, singing self-efficacy, and attitudes toward singing) will be addressed under the umbrella term of singing perceptions until a statistical analysis of the relationship is completed. To better understand this subject and all its component parts, a visual representation is presented in Figure 1.

Figure 1  Visual representation of conceptualization of singing perceptions.

**Singing identity.** One aspect of perceptions includes the different ways that people view themselves. Many scholars agree that there is an overall self-identity that is comprised of several subcategories. These subcategories have two names. They are either known as subject specific self-concepts or subject identities that relate to various aspects of a person’s life (MacDonald, Hargreaves, & Miell 1997; Song & Hattie, 1984, 1985). This study will use the term singing identity to represent the subject specific aspect of an individual’s overall identity as it relates to singing.

The reason for this selection is because researchers in the areas of music education, general education, and cognition have used the term self-concept in a multitude of ways representing both identity and self-efficacy beliefs. Bong and Skaavlik
demonstrated the many uses of the term self-concept in an extensive published review. In education or academic self-concept literature, Bong and Skaavlik found that self-concept was often used synonymously with self-efficacy and also at times with an individual’s attitude toward a subject. The review also revealed, however, that self-concept was often differentiated from efficacy and attitude. For the purpose of this study, the term singing identity will be used rather than the term self-concept in order to differentiate between self-concept and self-efficacy. Singing identity will refer to a person’s concept of his or her singing self-image while self-efficacy and attitudes will be labeled separately.

Research in the area of singing identity is limited. There are quite a few studies, however, about musical identity in general, especially concerning the formation of musical identity. Most researchers agree that children are generally capable of establishing their musical identity around the age of seven to eight with social influences of family, teachers, and peers being vitally important (Eccles, 1993; Harter, 1999; Lamont, 1998/2002; Wigfield et al., 1997). More specifically, Lamont in her 1998 study examined the formation of children’s musical identities in schools and found social comparisons to be crucial.

Studies examining singing identity specifically are less prolific than those regarding musicianship. Existing studies, however, have demonstrated that singing may be related to one’s self-image. For example, an investigation of adolescents’ vocal self-image that found singers were just as keen to improve their vocal sound for self-satisfaction as for passing an exam or doing a concert performance. This suggests that singing has strong links with a sense of self. (Monks, 2003, p. 250)
In 2009, Parker found, in a large qualitative study, that choir membership helped to bolster students’ sense of self. Cuddy et al. in 2005 conducted a study concerning the predictors of self-reported tone deafness. The study found that vocal production perceptions and listening attitudes were the best predictors of self-reports of tone deafness. Surprisingly, music instruction and childhood memories were not significant predictors of tone deafness. In summary, literature regarding singing identity is sparse. The existing the research, however, indicates that singing is related to identity (Cuddy et al., 2005; Monks, 2003; Parker, 2009).

**Singing self-efficacy.** In 1977, Bandura identified self-efficacy as the “conviction that one can successfully execute the behavior required to produce the outcomes” (p. 193). Bandura went on to identify self-efficacy as important to current and future participation in an activity. Often research identifies self-concept synonymously with self-efficacy (Asmus, 1990; Bong & Skaavlik, 2003). Much of the research in self-concept or self-efficacy comes from studies concerning attribution theory or reasons that people attribute to success and failure at a given task. Researchers have established over the last 40 years that a positive self-concept or high level of self-efficacy is related to attributions or motivations. Asmus (1990) stated that

> Self-concept plays a dominant role in motivation theory. How we feel about our abilities is perceived as a principal ingredient in determining our propensity for future striving at a task (p. 259).

Therefore, if individuals are confident about their singing ability, they will be more motivated to participate. In 1983, Maehr found that a high self-perception of competence at a musical task promoted continued involvement with the musical task. Richards (1999) also found that confidence in the ability to sing was crucial in determining
participants’ willingness to sing. Cuddy et al. (2005) found in surveying college students that self-efficacy reports regarding the ease of singing predicted the self-reports of tone deafness. Hedden (2007) found similar results when studying participants and non-participants of an elementary honor choir. Her data revealed that students who participated in the honor choir were more likely to perceive themselves as good singers. Likewise, Campbell (2010) found that students who had more positive perceptions of their musical future were more likely to be participating in music at the time of the study. Thus research appears to indicate that self-perception may be tied to initial participation in singing as well as motivation to persist in singing activities.

**Singing attitude.** An individual’s attitude toward singing may be influenced by both their singing identity and their beliefs regarding self-efficacy. Lamont (1998ab) found that during adolescence, attitudes and feelings toward music become important to the formation of individuals’ musical identities. Other studies have also examined participants’ attitudes toward singing in order to better understand singing perceptions. Mizener (1993) used attitudes to investigate elementary students relationship to singing and choir participation. The results revealed that as age increased, enjoyment of singing decreased in elementary students. Girls reported enjoying singing more frequently than boys. Hedden (2007) also studied children’s attitudes, by focusing on the differences between participants and non-participants in an elementary honor choir. Participants in the honor choir more frequently reported they liked to sing than non-participants (Hedden, 2007).

Most other research concerning attitude focused on adults. Richards conducted a study in 1999 with preservice general education teachers taking a course in teaching
music. In surveying participants, Richards found that 59% of students reported liking to sing while 38% did not like singing. On a different item, however, 95% of the same participants claimed they enjoyed singing along with the radio when they were alone. The researcher theorized that discrepancies in participant attitudes may indicate that the context of singing is important in the formation of participant attitudes. Wheaton (1998) found similar results when surveying a group of adults who classified themselves as non-singers. Even though participants’ identities did not include singing, all participants in Wheaton’s study reported they liked to sing when no one was listening. These results indicate that an individuals’ attitude about singing is not always related to their identity or self-concept. Thus in the overall view of an individuals relationship to singing, it is possible to not identify oneself as a singer, but enjoy singing in some contexts.

In another study focusing on adults, Peterson (2001) found that adults who participated in group singing were more likely to have a good attitude about singing. In a different study, Turton and Durrant (2002) focused on how school experiences affected enjoyment and found that many adults who did not like singing in school were currently participating in some type of community singing. Cuddy et al. (2005) found differences in attitudes about singing between people who identified themselves as tone deaf and those who did not. The researchers also found that attitudes about singing best predicted individuals’ report of tone deafness. Ruismaki and Tereska (2008) looked at attitudes in relationship to a broader area of musical activities and found that participants enjoyed singing, but their overall attitude about music often mimicked what they thought about their music teacher. Thus, according to research, the role of attitude or enjoyment of
singing plays an important part in understanding singing perceptions (Peterson, 2001; Richards, 1999; Ruismaki & Tereska, 2008; Turton & Durrant, 2002; Wheaton, 1998).

**Predictors of Singing Perceptions**

In trying to determine why people identify themselves as tone deaf, it is crucial to understand how individuals form perceptions about their singing. MacDonald et al. (2002) stated

> Children’s development of musical identities (origin in biological predispositions toward musicality) are shaped by the individual groups and social institutions that they encounter in their everyday lives. [Additionally] these form an integral part of identities not just provid(ing) a framework. (p. 7)

Researchers have identified many predictors, including home environment, music learning environment, social comparisons, ethnicity, age, gender, and singing experience, that contribute to the formation of singing perceptions. The predictors and the proposed conceptualization of singing perceptions are visual represented in Figure 9.

![Figure 2. Visual representation of the proposed predictors and conceptualization of Singing Perceptions.](image-url)
Home environment. Another possible predictor of singing perceptions, identified by research in the field of music development, is that of home environment. Sloboda et al. (1996) found in studying the development of instrumental skills that parents had a crucial influence on their child’s progress in musical skill acquisition. The sample was comprised of instrumental music students, so it is not certain that the finding would translate to singing. In 2000, Zdzinski and Skok found that family background was instrumental in shaping participants’ attitudes about music. More specifically, individuals who had positive influences in these areas were much more likely to have a positive attitude about the possibility of teaching music and singing with their classes. Turton and Durrant (2002) found that feedback from family had a large part in forming participants’ ideas about singing. MacDonald, Hargreaves, & Miell (2002) also reported that family was key in the development of children’s musical identity. Finally, Siebenaler (2008) confirmed the statement by MacDonald et al. in his study with elementary students where he found that parents had the great influence on children’s musical identity (Siebenaler, 2008). Therefore based on the research in both singing and music, home environment appears to play a role in the development of singing and music perceptions and participation.

Music learning environment. Research also found that teacher feedback as well as parental feedback had great influence over children’s musical self-concept and attitudes about music (MacDonald et al., 2002; Siebenaler, 2008; Turton & Durrant, 2002; Zdzinski and Skok; 2000). In surveying participants to determine why they disliked singing or lacked confidence in singing, Richards (1999) found that 41% claimed negative singing experiences in formal school greatly influenced their perceptions of
singing. In a factor analysis of self reported tone deaf participants, Cuddy et al. (2005) found that musical instruction played a role in participants’ singing perceptions. Ruismaki and Tereska (2008) found in surveying Finnish young adults that singing was one of the most popular activities in school music, but participants’ attitudes about singing often mimicked their attitude about their music teacher. The results of these studies indicate home and school environment, as well as other areas of music instruction, may play a role in determining singing perceptions. None of these studies, however, investigated all three aspects of singing perceptions presented in the model including singing attitudes, identity, and self-efficacy.

Social comparisons. Studies also indicate that social comparisons may be a predictor of singing perceptions. According to MacDonald et al. (2002), social comparisons play a key role in the formation of domain specific self-images. Social comparisons occur when an individual compares their performance, in this case singing, with another person’s performance. Often social comparisons are made with peers as indicated by Sloboda (1996) who found peers could have a negative influence on students motivation to practice and develop of instrumental music skills. Turton and Durrant (2002) also found that feedback from peers in addition to parental and teacher feedback was important in the formation of participants’ ideas about singing. In another testament to the power of peer influence, Mills (2010) found in interviewing children involved in an auditioned children’s chorus that

There is a sense among the choristers that being too involved in music makes a person different, and that being different in that way is not desirable. They do not want others to label them as musicians, even though they might choose those labels for themselves (p. 52).
Thus children in the study did not want to be labeled even for their musical achievements because this would single them out from their peer group.

Social comparisons, however, are not limited to peers nor are they limited by time or location. They encompass any comparisons a person makes of their performance to another persons’ performance whether it be an amateur or professional or at the same time or a recording from a different time (Chinn, 1997; MacDonald et al., 2002). There are several studies that explored social comparisons beyond the peer group. Sloboda et al. (2005) conducted a study with individuals ($N = 15$) identifying themselves as tone-deaf. They found that social comparisons and fears about how other people perceived their singing led individuals to believe they could not sing. In a case study, Whidden (2009) also found social experiences were important in forming singing perceptions. Specifically, she found “that childhood experiences of singing adversely affected their participation in singing as an adult and their concept of self as singer for years and sometimes decades” (p. 27). In summary, research concerning social comparisons reveals that both peer influence and other types of comparisons are significant to the formation of singing perceptions.

**Ethnicity, age and gender.** Another possible group of singing perception predictors comes from research in the area of ethnicity, age, and gender. Chinn (1997) found that ethnicity or specifically cultural identity was related to singing among female African American adolescents. MacDonald et al. (2002) supports Chinn’s research with their statement that identities in music have a basis in social categories and cultural musical practices. In 2008, Siebenaler found differences in singing perceptions based on
ethnicity. Data revealed that Hispanic boys liked to sing much less than African American boys.

There are a number of studies that explored singing in relation to age and also included gender in their investigation (Mizener, 1993; Siebenaler, 2008; Ruismaki & Tereska, 2008). As stated previously, researchers agree that self-image doesn’t solidify until age seven or eight (Eccles, 1983; Harter, 1999). Mizener in surveying elementary students, found that attitudes about singing changed across age groups with positive attitudes decreasing as age increased. Additionally, girls reported a more positive attitude toward singing than boys.

Siebenaler’s (2008) survey of elementary students confirmed the research of Mizener in that younger children were more positive about singing than older children and girls liked singing better than boys. Ruismaki and Tereska (2008) also found that students recalled enjoying music especially singing at a young age, but as they came into adolescents they did not enjoy it as much. A return of positive attitude toward singing occurred in late adolescents, however, this may be due to the fact that music was by that time an elective so only those who enjoyed music chose to participated. Results revealed participant differences in age groups according to gender. Females were more likely to report that they enjoyed singing than males. Thus, research indicates ethnicity, age, and gender may be related to singing perceptions specifically singing attitude. More information, however, is needed to fully understand if ethnicity, age, and gender predict singing perceptions.

**Singing experiences.** The term singing experiences refers to any observation of or participation with singing (“Merriam-Webster Online,” 2010; Zdzinski and Skok,
Zdzinski and Skok (2000) discovered that non-school music experiences, such as concert attendance in addition to family background and school experiences, helped to shape participants attitudes about music. In a contrast to social predictors of singing perception, research by Fuchs et. al (2007) demonstrated that participation is important in vocal development and also in establishing a positive self-perception about one’s voice. Additionally, studies by multiple researchers found that successful musical performances enhanced perceptions about music (Greenberg, 1970; Michel, 1971; Nolin & Vander Ark, 1977; Asmus, 1990). Soboda (2005) in *Exploring the Musical Mind* reported that the most significant musical memories that occurred were listening experiences. He stated that significant meaning was transmitted were mainly informal relaxed occasions when the person was not evaluated, and was in the company of loved ones. [Furthermore,] it seems that children experiencing events with positive internal significance were more likely to pursue a high level of involvement with music later in life. (p. 185)

Abril (2007) also found that negative experiences in early adolescents with singing contributed to singing anxiety in adults taking required music classes. Cuddy et al. 2005 found that listening experiences related to singing such as how often a tune gets stuck in one’s head or how often one recognizes a song from few notes were statistically proven predictors of tone deaf self-reports.

Researchers have studied the relationship between singing perceptions specifically self-efficacy and music participation. They found mixed results with some claiming self-efficacy as important and others finding that student beliefs about their abilities were not always accurate. Interestingly in contrast to the majority of other studies, Sweet (2010) found self-efficacy was not correlated to participation. This
contradicts previous research and since it was a study with band students. It would be interesting to discover the effects of self-efficacy on singing.

In examining all the research about singing predictors, many of these studies included attitude, identity, or self-efficacy, but none of the studies examined all three aspects. Also, only Turton and Durrant (2002), Ruismaki and Tereska (2008), and Whidden (2009) specifically focused on how individuals’ form perceptions about singing. Turton and Durrant as well as Ruismaki and Tereska focused their research solely on school experiences. However, research points to other influences being equally important in the formation of an individual’s beliefs about singing perceptions. Whidden’s study is fascinating, but the small sample limits the generalizability of the research. Thus, a study examining how people form perceptions about singing and investigating multiple predictors of singing perceptions with a larger sample seems warranted.

**Need for the Study**

The research regarding singing indicates that an individual’s relationship to singing is complex and multifaceted. To date, however, the studies examining perceptions toward singing have concentrated on only one or two of the three aspects of singing perceptions found in the literature. No study conducted in the United States has established a complete picture of the formation of singing perceptions, and how they affect individuals across their lifetime. The evidence indicating the importance of accurate singing perceptions comes from studies regarding self-reported tone deafness. Cuddy et al. (2005) and Sloboda et. al (2005) both found that individuals claiming to be tone deaf often did not have accurate assessments of their own singing abilities.
Unfortunately, if people believe they cannot sing, they may be less likely to participate in singing activities, which would deprive many people from reaping the benefits of singing outlined in the beginning of this chapter. Therefore, although information about the formation of singing perceptions exists; none of the current research studies examine all of the predictors indicated across the literature. Additionally, evidence found in research by Campbell (2010), Hedden (2007), and Peterson (2001) points to a possible connection between singing perceptions and participation in children, adolescents, and adults. There is no research, however, examining this as a causal relationship. Thus, in order to better understand the formation and composition of singing perceptions as well as how they relate to an individual’s participation in singing more research is needed.

**Purpose Statement and Related Research Questions**

The purpose of this study will be to investigate the predictors of self-labeled singers and non-singers’ beliefs about singing, with the additional goal of exploring a conceptualization of singing perceptions.

1) What are the factors that make-up the current singing perceptions of college students?

   a. What is their singing identity?
   
   b. What is their current level of singing self-efficacy?
   
   c. What is their attitude toward singing?
   
   d. How do singing identity, singing self-efficacy, and attitude toward singing relate to singing perceptions?

2) How do home environment, music learning environment, social comparisons, race/ethnicity, age, gender, and singing experiences affect singing perceptions in the college students?
3) What are the current singing experiences of college students and how does participation differ based on singing perceptions?

**Delimitations**

In creating this study, care has been taken to account for as much variance in singing perceptions as possible given the time and resources available. In cataloging singing perceptions the goal of the study is to understand how perceptions were formed not judge the accuracy of individuals’ self-efficacy. This study is not concerned about the quality of singing, but instead it focuses on the reasons why people identify themselves as singers or non-singers, why they believe they can sing, or why they enjoy or dislike singing. As mentioned in the section on amusia, research suggests that most people can sing (Cuddy et al., 2005; Pfordresher & Brown, 2007). This does not mean all people are good singers. Research shows, however, that one of the best ways to improve singing is through participation (Greenburg, 1970; Fuchs et al., 2007). Motivation theory also ties self-efficacy to motivation and in turn participation (Asmus, 1986, 1990; Eccles, 1983). If people believe they cannot sing, they most likely will not try and thus not improve (Richards, 1999). The results of Richards (1999) study are representative of college students with the understanding that the reports they give about their previous experience may be subject to memory bias (Sloboda, 2005). If the memories are significant to the individual, they may be useful in understanding their singing perceptions (Abril, 2007; Sloboda, 2005; Whidden, 2009).

This study will also attempt to take into account differences in singing regarding gender (Mizener 1993; Ruismaki & Tereska, 2008). An in-depth exploration of the male voice change, and how it affects singing participation is not the focus of this study. There
will be opportunities for participants to discuss events, which affected their singing perceptions. It is hoped that any significant negative singing perceptions developed due to voice change will be reported as a part of the open response section of the study.

In addition to gender differences, research also shows that negative singing experiences affect singing perceptions and can cause anxiety or singing performance anxiety (Abril, 2007; Richards, 1999; Whidden, 2009). The purpose of this study is not to explore performance anxiety. The hope is that studying the formation of singing perceptions will help music educators better understand how to prevent students from acquiring inaccurate beliefs about their ability and keep them from developing adverse feelings toward singing.

**Definitions**

For the purposes of this study, the following terms will be defined as follows:

*Amusia (Congenital Amusia):* Scientifically recognized developmental disorder that prevents individuals from singing on pitch despite having healthy musculature, normal hearing, exposure to musical training, and normal intelligence (Cuddy et al. 2005).

*Home Environment:* Home environment refers to parental and familial support of singing both in the home and outside the home including parents singing with or to their children.

*Music Learning Environment:* Any singing events, memories, or interactions related to teachers and formal music instruction in school, in private lessons, or through community or religious singing programs

*Non-singer:* An individual who does not identify himself or herself as a singer.

*Poor Singer:* An individual who has great difficulty matching pitches consistently, but can match a small percentage of pitches in a given grouping.
Singing Experience: A situation in which an individual directly observes or participates in singing in any context (formal or informal) and any environment (home, school, place of worship, social or community group).

Social Comparisons: Peer influence on singing and any time an individual compares their singing with another person or group’s singing.

Singing Attitude: This term represents individual’s affective response(s) to singing including: their attitudes toward singing, feelings and emotions about the activity of singing as well as beliefs about the importance and place of singing in one’s life.

Singing Identity: A subcategory of an individual’s overall personal identity. This domain specific identity relates to an individual’s concept of himself or herself in relation to the activity of singing. More specifically, it also refers to an individual’s label of his or herself as a singer or as a non-singer.

Singing Self-Efficacy: An individual’s beliefs about and confidence in their ability to successfully complete a singing task in both general and given contexts (Bandura, 1977).

Singing Participation: Involvement with any activity in which an individual sings.

Singing Perceptions: A term to encompass the complex relationship of individuals to singing. The term is proposed to contain an individuals’ singing identity, level of self-efficacy or level of confidence in singing, and their attitude(s) regarding singing.

Tone Deaf: A commonly used phrase that often describes an individual’s inability to match pitch. Research indicates individuals also use this term to label themselves as poor singers and in some cases as non-singers (Sloboda et al., 2005).

Uncertain Singer: An individual, who can accurately reproduce some pitches, but has difficulty maintaining the overall integrity of a pitch set or melody.
Chapter 2

Literature Review

The purpose of this study is to investigate predictors of self-labeled singers and non-singers’ beliefs about singing across their lifetime with the additional goal of exploring a conceptual model of singing perceptions. The studies included in this review were chosen to represent the most current and relevant research on singing perceptions, both their composition and formation. The review is divided into four main sections: (a) Singing Ability in the General Population, (b) Composition of Singing Perceptions, (c) Predictors of Perceptions about Singing Abilities, and (d) Summary.

Singing Ability in the General Population

Prevalence of amusia. In examining why people do not sing, Sloboda, Wise, and Peretz (2005) and Pfordresher and Brown (2007) reported somewhere between 17 and 59% of participants surveyed identified themselves as tone deaf. This common label is also known scientifically as amusia. It is a condition that prevents individuals from aurally perceiving and accurately reproducing pitches when all other physical organs are normal and healthy (Cuddy, Balkwill, Peretz, & Holden, 2005). Individuals with amusia cannot sing and will not be able to sing accurately even if they receive singing instruction. The exact number of people suffering from amusia remains somewhat unclear, but it appears to be less than 10% (Henry, 2010; Kalmus & Fry, 1980). This number is significantly lower than the self-reported incidence found by Sloboda and Pfordresher and Brown. The prevalence of amusia is relevant to this review because it sets up a scientific base of comparison between the number of people who may have amusia and the number of people who claim to be tone deaf.
There are several studies from the last thirty years that focus on determining the prevalence of amusia. One of the main studies that speculated about the prevalence of amusia in the general population was Kalmus and Fry, 1980. Their examination of 604 individuals revealed that 4% of those tested were unable to accurately recognize pitch mistakes on the 50 item measure of pitch perception. This led them to estimate that amusia affected approximately 4% of the general population. Ground breaking for its time, this study has now come under question because it only dealt with aural pitch perception and not the individual’s ability to sing or reproduce sounds.

Later Peretz, Champod, and Hyde (2003) created the Montreal Battery of Evaluation of Amusia (MBEA), which examined an individual's ability to perceive melodic and rhythmic organization as well as his or her music memory. This test is much broader than the previous measure created by Kalmus and Fry (1980). Gravetter and Wallnau (2006) conducted a study using the MBEA that led them to estimate that 2% of the general population had amusia. In 2010, Henry published a critique of the prevalence of amusia studies. She speculated that the cut off scores in both the Kalmus and Fry (1980) measure as well as the MBEA were arbitrary and that their data was skewed. In re-examining the data, Henry claims that it is more likely around 7% percent of the general population suffers from amusia (Henry, 2010). More research will need to be conducted before a true estimate is possible. The general consensus, however, appears to be that approximately 2-7% of the general population suffers from amusia (Gravetter & Wallnau, 2006; Henry, 2010; Kalmus & Fry, 1980). Considering this range, it is therefore likely that baring an illness or other physical disability around 90% of the
general population has no documented physical condition that prevents them from singing.

**Prevalence of poor/uncertain singers in the general population.** In examining other reasons why people identify themselves as tone deaf besides amusia, it is important to consider the prevalence of poor singers. These are people that are not known to suffer from amusia, but cannot sing consistently in tune (Dalla Bella, Giguere, & Peretz, 2007). Several studies investigated the prevalence of poor singing in the general population and found vastly differing results. One study, conducted in 2000 by Price, investigated the singing ability of non-music major college students (N = 141). The researcher recorded participants singing "Happy Birthday" and performing interval-matching exercises presented by male and/or female voices.

The data analysis revealed that 37% of the sample met the criteria for uncertain singers. This is by far the highest percentage of poor singing found in all the research to date. It is unclear if all of these uncertain singers would fall into the categories such as amusia or pitch poor singers used in other studies. The description of the classification uncertain singer stated that the singer did not stay in one key when singing "Happy Birthday" unaccompanied. The researcher did not provide more specific data regarding this classification although the students in the category did score poorly on pitch matching exercises (Price, 2000).

Conversely a study by Dalla Bella et al. (2007), found a significantly smaller number of poor singers in the general population than Price (2000). Gathering a random sample of people from a park and university setting, Dalla Bella et al. examined the ability of people to sing the Quebec version of "Happy Birthday." The researchers
compared the data taken from the general public with a small sample of professional singers asked to complete the same vocal task. Results indicated that out of 62 people tested, approximately 3% made over 10 errors, and were thus classified as poor singers (Dalla Bella et al., 2007). The researchers concluded that singing proficiency appears to be normally distributed in the general population with a majority of occasional singers being able to sing on time, with few pitch deviations. (p. 1186)

Pfordresher and Brown (2007) also examined singing in the general population in the second follow-up experiment conducted as a part of their study. A sample of 45 students from the University of Buffalo, were asked to complete a series of pitch discrimination tasks and interval matching exercises. The pitches selected for the interval matching section were chosen based on a preliminary assessment of each participant’s comfortable vocal range. The researchers found that 16% of the sample scored in a range of pitch-poor singers.

Taken as a whole the estimates of these studies suggest that between 3-37% of the population are poor singers (Dalla Bella et al., 2007; Pfordresher & Brown, 2007; Price, 2000). The reason that these studies found such different percentages is unclear. Most likely it can be accounted for by the fact that they used varying methods of evaluation and because each researcher used different labels to represent the various levels of singing competency. More research is needed to clearly determine the percentage of the population who are uncertain or pitch poor singers.

While the prevalence of poor singers is unclear, research suggests that the general population does appear to have some poor singers. Dalla Bella et al. states that a large percentage of the population has the ability to sing. Pfordresher and Brown (2007)
agrees finding that 70% of their sample could sing with few errors. Considering the data on the prevalence of amusia and the information from Dalla Bella et al. (2007) as well as Pfordresher and Brown, it appears that a majority of the general population can sing.

**Prevalence of poor singing self-image in the general population.** Given this evidence, it might be assumed that if surveyed most people would claim they could sing. Based on the data collected in several studies, however, this is not the case. In order to explore the prevalence of poor singing self-image, it is important to know what the general population believes about their own singing ability. It is also important to find out if their singing self-image is accurate. There is not a great deal of literature exploring this topic. Only a few studies have examined the number of people who identify themselves as either tone deaf, poor singers, or non-singers. Many of these studies also tested participants to determine if their self-labels were correct.

Wheaton (1998) conducted one such study investigating the singing perceptions of adults who labeled themselves as non-singers. She prescreened participants and identified 54 individuals who identified themselves as non-singers. Using a Likert scale survey, Wheaton examined participant behavior and attitudes about singing. She also tested singing ability by recording participants singing three familiar songs. These recordings were assessed for accuracy in pitch, intonation, tone quality, and volume. The results revealed that even though all the participants claimed they could not sing, 84% of them could sing a recognizable melody. Therefore, approximately 45 of the 54 participants had incorrectly labeled themselves as non-singers when they actually had the ability to sing fairly accurately.
Another researcher (Peterson, 2001) surveyed 481 adults regarding singing and participation in community and church choirs. Data revealed that 12.8% of the adults surveyed claimed they could not sing. This percentage is well above the occurrence of amusia in the general population (Gravetter & Wallnau, 2006; Henry, 2010; Kalmus & Fry, 1980; Peretz et al., 2003). It is, however, less than the percentages of people identifying themselves as tone deaf found by other researchers (Cuddy et al. 2005; Pfordresher & Brown, 2007). Cuddy et al., conducted a study that surveyed 2,810 first year psychology students about their singing. The researchers found that approximately 17% of participants identified themselves as tone deaf. As a secondary part of the study, they selected 100 participants who claimed to be tone deaf, and 100 participants who did not claim tone deafness. They had both groups complete the Montreal Battery for the Evaluation of Amusia (MBEA). Their results indicated that only 11% of the 100 participants claiming tone deafness scored low enough to be classified as having amusia. Therefore, approximately 89% of the self-identified tone deaf participants had inaccurately identified themselves. Furthermore, Cuddy et al. (2005), stated

the prevalence of self-reported tone deafness in two large samples of young adults is almost 17%. This relatively large estimate leads to the suspicion that many of the self-reported “tone-deaf” (participants) may not be amusic. They may undervalue their abilities, but may, in fact function normally. Furthermore, they may with encouragement, be capable of acquiring and appreciating many of the social and personal benefits of the musical world. (p. 312)

The third part of the study examined predictors of participant singing self-efficacy. The predictors identified will be reported later in this chapter.

Another study concerning the number of people who perceive themselves as non-singers is Pfordresher and Brown, 2007. The researchers administered a questionnaire to 1,150 college students from the University of Texas San Antonio. Of those surveyed,
59% claimed they could not reproduce melodies by singing. Using this sample, the researchers conducted two experiments. The first experiment drew 79 participants from the same population. Thirty-eight of whom were chosen because they had identified themselves as poor singers in the initial survey. The remaining 41 participants were not asked about their singing ability prior to the study. Both the self-identified poor singers and those not surveyed about their singing ability completed a series of tests. These tests measured their ability to accurately reproduce tones presented aurally and to discriminate between pitches. The results indicated that ten (13%) of the 79 participants were pitch poor singers. Interestingly, only four (10%) of the 38 self-identified poor singers actually had scores low enough to classify them as pitch poor singers according to the researcher created test guidelines. Therefore, in this study 34 participants (43%) had incorrectly labeled themselves as pitch poor singers (Pfordresher & Brown, 2007).

Finally Wise and Sloboda (2008), examined individuals labeling themselves tone deaf. Using the Montreal Battery for the Evaluation of Amusia the researchers, investigated the frequency of music difficulties found between a group of self-reported tone deaf participants ($n = 13$) and a group individuals ($n = 17$) who did not label themselves as tone deaf. The results indicated that none of the participants in either group qualified as having amusia, and all of the participants claiming to be tone deaf had average scores. Self-reported tone deaf participants did have lower singing and confidence scores than participants not identifying themselves as tone deaf. This lead the researchers to conclude that self-labeled tone deaf participants recognized they had some difficulty singing. The scores of self-labeled tone deaf participants, however, indicate that they were not far behind the other participants. The researchers speculated that given
some additional instruction, the singing scores of the self-identified tone deaf participants would be able to improve and be in the same range as the other participants (Wise & Sloboda, 2008).

In examining the research of Wheaton (1998), Cuddy et al. (2005), Pfordresher and Brown (2007), and Wise and Sloboda (2008) data shows that few if any participants who labeled themselves as tone deaf actually sang exceptionally bad or had amusia. Some of the studies such as Wheaton (1998) even indicated that an extremely large portion of people claiming to be tone deaf could sing. Wise and Sloboda discuss, many people who claim to be tone deaf may not sing as well as those who do not claim this deficiency. Still, people who do not sing well can with instruction be helped to sing better. The evidence suggests there may be a large portion of the general population who have erroneously identified themselves as either tone deaf or as poor singers.

Composition of Singing Perceptions

In attempting to understand why people form inaccurate beliefs about their singing, one must understand the complex relationship between individuals and singing (Monks, 2003). A number of studies examined what people believe about singing, and they have used different terms to discuss the relationship between individuals and singing. Some of the earliest studies were by Lillemyr (1982, 1983), who acknowledged issues with terminology such as self-esteem, self-concept, and perceptions. Lillemyr studied the motivation to participate in general music with several hundred elementary students across two studies. Results showed that student’s perceptions regarding music usually predicted their motivation and interest in music. Students with low self-perceptions were less likely to be motivated and interested in music participation. In
examining the literature, the term singing perceptions was chosen to represent an individual’s relationship to singing (Haskell, 1987; Lillemyr, 1982, 1983; Wheaton, 1998). Additionally, it is theorized that singing perceptions may fall into three categories: singing identity, singing self-efficacy, and finally singing attitude. Further statistical analysis is needed to determine the factors comprising singing perceptions.

**Singing identity.** In this study, singing identity will be known as one’s beliefs about self in the specific domain of singing (Song & Hattie, 1984, 1985). Research on singing identity is limited, but there are some studies addressing the topic of music and its affect on self and identity. In 2002, S. O’Neil researching music identity found in a qualitative study with four girls that music played a distinctive role in each girl’s life. For some music was a central part of their identity and for others music was merely a peripheral activity or hobby. It does appear, however, that domain specific singing identity may be important to an individual’s overall identity and may be unique to each person.

A qualitative longitudinal study by Monks (2003), investigated voice and self-image with 30 adolescents ages 11-17. Using interviews and case studies with 15 of the 30 participants, Monks discovered that singing had strong ties to an individual’s sense of self. According to these results, singing perceptions form a complex relation to image of self or singing identity. Hays (2005) also found evidence that music perceptions may be tied to identity. In a qualitative study with 52 elderly Australians, Hays (2005) discovered that

Music is an important part of the lives of people because it is through music that they can come to know and reflect upon their own personhood. Participants used music as a symbol for defining their own sense of self and identity. Music is a symbolic representation of ‘who’ the participants are and
how they would like to be perceived by others. (Hays, 2005, p. 440)

Furthermore, participants reported that music helped provide identity as well as assist them in maintaining positive self-esteem. Participants also reported that music was a way to redefine themselves and rediscover their identity after retirement (Hays, 2005). A review of cognitive psychology by Hodges (2005) reached the same conclusion as Hays in stating that music was essential to the development of self-knowledge and identity.

Investigating three mid-west high school choral programs, Parker (2009) verified the research of Monk and Hays regarding identity. Using data collected in 49 interviews, Parker discovered that adolescent students’ self-identities were closely tied to their identity as singers and members of singing ensembles (Parker, 2009). Turton and Durrant (2002) also found that group singing identity was important. When they asked English adults what type of singing instruction they wished had been a part of their school experience, participants’ reported they wanted instruction that would provide a group identity and not just a sing-a-long experience (Turton & Durrant, 2002). Based on this data, music and singing appear to be important to identity in individual and group settings.

One of the most negative forms of singing identity is the label of tone deafness. The previous section entitled singing in the general population discusses many of the studies that explored this label. In addition to the studies mentioned above, Sloboda, Wise, and Peretz (2005) conducted a study to further examine the Montreal Battery for the Evaluation of Amusia (MBEA). Their secondary goal was to examine why people identify themselves as tone deaf. Utilizing a sample of 15 people ranging in age from 18-70, the researchers conducted semi-structured interviews examining participants'
beliefs regarding tone deafness. Participants generally defined a tone deaf person as someone singing loud and off-pitch. They also found that participants believed a person could be musical and tone deaf. For instance participants mentioned that an individual might be able to play an instrument, but not be able to sing on pitch. Participants said that severe tone-deaf people were not musical. Results also indicated that most participants believed tone deafness was permanent. The researchers also noted that other music researchers usually defined tone deafness in terms of perception while participants of the study defined it in terms of production (Sloboda et al., 2005).

In a later study again with self-labeled tone deaf participants, Wise and Sloboda theorized that

the relationship between self-concept and performance is complex and though every effort was made to help participants feel at ease, negative self-beliefs may also be contributing to the TD (tone deaf) group’s performance. For example, the expectation of doing badly may lead to tension and inhibition of the respiratory system and vocal mechanism, leading to sub-optimal performance, low self-assessments and thus establish a negative cycle. (Wise & Sloboda, 2008, p.20)

The authors suggest a vicious pattern may form with a negative self-concept making good singing difficult. Then poor performances, which result from a negative singing identity may cause an individual’s confidence in their singing to further deteriorate (Wise & Sloboda, 2008).

If true, this theory illustrates how very difficult it is to sing with a negative singing identity. It may even help to explain why some people simply prefer to avoid singing all together by hiding behind the label tone deaf rather than risking further poor singing performances. The research data suggests that musical identity is an important aspect of an individual’s relationship to singing (Hargreaves, MacDonald, & Miell, 2002; Hays, 2005; Monks, 2003; S. O’Neil, 2002). Additionally, research also demonstrates
the lasting and negative power that can come from a poor singing identity (Cuddy et al., 2005; Sloboda et al., 2005; Wheaton, 1998; Wise & Sloboda, 2008).

**Singing self-efficacy.** The term self-efficacy is representative of an individual's belief they can be successful at a given activity (Bandura, 1977). Most of the research regarding self-efficacy comes from studies about attribution or motivation to participate in music or singing. There is a long history of research in this area going back for at least thirty years. One of the earliest studies was by Eccles (1983), who investigated children’s motivation and achievement in music using both qualitative and quantitative methods. Eccles interviewed a number of children and adults to investigate their motivation for music participation. Through interviews, the researcher discovered that the assessment of one’s own competency to perform a specific task was closely related to motivation (Eccles, 1983). Further discoveries made pertaining to predictors of singing perceptions will be discussed in a later section of this review. Building on the research of Eccles, Asmus in 1986 and 1990 investigated attributions of success and failure in music. As a part of both studies, data revealed that self-efficacy was an important factor in student motivation to participate in music (Asmus, 1986, 1990).

Several studies investigated when individuals developed self-efficacy and how self-efficacy changes over time for music and other subjects. Eccles (1993) again surveyed elementary students, but in this study students were asked about both sports and instrumental music. The data indicated that most children solidify their competency beliefs around 1st grade. Over time, these beliefs are less positive with younger children often believing they can do anything and older children being less confident about their abilities (Eccles, 1993). Wigfield, Harold, Eccles, Suk Yoon, Freedman-Doan, Arbreton,
and Blumenfeld (1997) substantiated Eccles (1993) research. Investigating motivation in elementary children, the researchers surveyed participants about the subjects of reading, math, sports and instrumental music. The data indicated that competency beliefs were related to enjoyment of a subject (Wigfield et al., 1997), and that students did solidify their beliefs around the age of seven or eight.

Further evidence regarding the importance of self-efficacy to instrumental music comes from two sources. In a longitudinal study surveying children during their first year of learning a musical instrument, S. O’Neil (2002) reported that

children’s self-beliefs (i.e., confidence in their ability) play a key role in their subsequent performance ability and evaluations of their performances over and above their actual ability. In other words, the path way between the skills individuals can use and the skills they actually display in certain context is not direct but is mediated through their self-perceptions and in particular their ability-related self-perceptions. (p. 81)

This finding indicates that self-perceptions and especially self-efficacy are important in the development of musical skills (S. O’Neil, 2002). Simpkins, Vest, and Becknel (2010) also identified self-efficacy as an important part of elementary and adolescent students’ motivation to learn musical instruments. The data from this study suggests that self-efficacy as well as interest in the study of musical instruments predicted initial participation in childhood as well as participation in adolescence (Simpkins et al., 2010).

Most of the research involving self-efficacy in music centered investigated instrumental music. However, there is some evidence that self-efficacy affects individuals participating in vocal music. Cuddy et al. (2005) surveyed self-identified tone-deaf participants that self-efficacy beliefs were an important factor in participants’ beliefs about singing. The researchers conducted a factor analysis of perceptions about
the voice to better understand the components of participants’ beliefs. The category of vocal production, which included self-efficacy, was the highest loading factor of all categories studied. Thus the study results indicated that self-efficacy was a significant component of self-identified tone-deaf participants’ beliefs about their singing. Therefore most previous research suggested that self-efficacy is an important to the motivation to participate and attribution of success in many academic subjects including instrumental and vocal music (Asmus, 1986, 1990; Cuddy et al., 2005; Eccles, 1983, 1993; S. O’Neil, 2002; Simpkins et al., 2010; Wigfield et al., 1997).

In understanding why self-efficacy is so important to beliefs about an activity, Goetz, Cronjaeger, Frenzel, Lüdtke, & Hall (2010) investigated the relationship between emotion, achievement, and self-efficacy, which they called self-concept. Surveying 1700 adolescent about the academic subjects of math, physics, German, and English, the researchers found that academic self-efficacy was related to student’s emotions about a given subject. For instance, the emotions of pride and enjoyment were positively correlated to students’ self-efficacy while anger, anxiety, and boredom were negatively correlated to self-efficacy. Emotions were not as strongly correlated to self-efficacy as achievement (Goetz et al., 2010). Thus emotions may play a role in students’ academic self-efficacy beliefs, but achievement is also very influential.

**Singing attitudes.** In examining the literature, it appears that a number of studies investigating individuals’ relationships to singing used reported attitudes, feelings, and the importance of singing to the individual to better understand singing perceptions. Often surveys would ask participants if they enjoyed singing or under what circumstances did they liked to sing (Neill, 1998; Peterson, 2001; Turton & Durrant, 2002). Other
researchers concentrated on the importance or value participants’ places on music in their lives (S. O’Neil, 2002; Sichivista, 2001). Based on the research it seems attitudes, feelings, and values about singing are all important instruments in understanding an individual’s relationship to singing. For the purposes of this study, the term singing attitudes will refer to all three affective singing responses including: attitude toward singing, feelings and emotions about singing, and the value an individual places on singing in their life.

**Attitudes and emotions.** Lamont (1998/2002) discusses the impact of attitudes as a part of singing perceptions the chapter about musical identities and school environment. The author claims that as children move into middle childhood their attitudes and feelings about music become a dominant force in their musical identities. As mentioned in the general population section of this review, Hedden (2007) conducted a survey with elementary students regarding participation in an honor choir, which substantiates Lamont’s statement regarding the importance of attitudes. Hedden found that participants of the honor choir generally reported a more positive attitude regarding singing than non-participants. The data is unclear in determining if participants liked singing because they were chosen for the honor choir or if their enjoyment of singing affected their decision to participate. Attitudes about singing, however, do appear to have a relationship with singing participation (Hedden, 2007).

**Attitudes and motivation to participate.** Several other studies, besides Hedden (2007), reported evidence of a possible relationship between attitude about singing and participation in singing activities. Neill (1998) illustrated the importance of attitudes to adolescents. As a part of her dissertation regarding high school students’ motivation to
participate in chorus, Neill (1998) found that out of the 1000 students she surveyed the number one reason given for participation was a love of singing. This data indicates that attitudes may be a significant factor in the motivation to sing.

Kennedy (2002) also investigated adolescents’ relationship to singing. Specifically, she used qualitative methods to study junior high school boys’ motivation to participate in choirs. Like Neill (1998), all of Kennedy’s participants were also choir members. In participant interviews, the main reason given for choir participation was a love of singing (Kennedy, 2002). Further results from this study will be discussed later in the review in the section on predictors of singing perceptions. The research of Neill and Kennedy’s studies suggest there may be a relationship between attitude and singing participation. In terms of generalizability, one must consider that the samples of both studies comprised students who were already involved in choirs. Therefore their results are representative only of individuals already singing and do not provide insight into the motivation of individuals who are not choir participants (Kennedy, 2002; Neill, 1998).

Simpkins et al. (2010), however, used a broader sample when investigating children’s motivation to participate in sports and instrumental music. Like Neill (1998) and Kennedy (2002), the researchers found that attitudes or interest in studying a musical instrument predicted initial participation in children as well as continued participation in adolescents (Simpkins et al., 2010). Unfortunately, the applications of this research is limited because the data relates to instrumental music and not singing. Still the results from Simpkins as well as those found by Neill and Kennedy as well as Lamont’s statement about children, indicate that attitudes may be powerful influences in lives of adolescents as well as children.
Further evidence pointing to a possible relationship between participation, motivation, and attitudes about singing, comes from a study by Peterson (2001). The purpose of the study was to examine the singing attitudes, investigate the self-perceptions of singing ability, and study types of reinforcement for singing tasks. The sample included both self-proclaimed singers and self-proclaimed non-singers aged 18-40. Peterson specifically examined church attendance, church choir participation, family influence, and gender as factors affecting an individual’s perceptions of their singing ability. He found that adults who participated in group singing were more likely to have a good attitude about singing and have a more positive view of their own singing ability.

Additionally, adults who enjoyed singing were more likely to participate in singing activities and be more positive about their own singing. Therefore, it is difficult to say if adults participated in singing because they enjoyed singing and believed they had some singing ability. Or if by participating in singing, their enjoyment of singing as well as their estimation of their own singing ability increased (Peterson, 2001). While not conclusive, the evidence from Neill (1998), Peterson (2001), Kennedy (2002), and Simpkins et al. (2010) seems to indicate a possible relationship between music participation, motivation, and attitudes about singing.

**Affect of attitudes on singing perceptions of singing experiences.** Another aspect of attitude on singing involves the possible relationship between attitude and specific singing experiences. In 2002, Turton and Durrant used reports of attitudes and enjoyment to investigate adults’ school singing experiences in the English secondary education system. Unlike Neill’s (1998) study, Turton and Durrant’s participants were not selected based on choir participation, but were chosen at random from the
community. Their research revealed that participants wished singing repertoire was more relevant and not antiquated. They also found that attitudes about the music teacher impacted participants’ attitudes about school singing (Turton & Durrant 2002).

Negative attitudes about school singing experiences, however, did not prevent individuals from participating in community singing later in life. In fact the largest percentage of participants who were involved in community singing later in life, professed that they did not like singing in school. The data from this study and its insight into school experiences will be discussed in more detail in the section of this review entitled predictors of singing perceptions (Turton & Durrant, 2002). Ruismaki and Tereska (2008) also used attitudes to investigate school experiences in Finland. Unlike Turton and Durrant (2002), this study encompassed all music experiences and in the results participants rated singing as their most enjoyable musical experience (Ruismaki & Tereska, 2008). Thus, there is evidence that an individual’s attitude about singing may affect their view of singing experiences.

As mentioned earlier in this chapter, Cuddy et al. (2005) conducted a study about self-reported tone deafness. In the third part of the study, singing attitude, participation, and singing ability of individuals labeling themselves tone deaf were investigated. The subjects included students selected randomly from a university population. Participants completed a survey about their singing perceptions. Then researchers measured singing abilities using the Montreal Battery for the Evaluation of Amusia (MBEA). Data from the survey on voice perception was analyzed using a factor analysis. The highest loading factor was vocal production, which best predicted both participants’ beliefs about their singing as well as their actual singing ability. The vocal production factor comprised
both reports of self-efficacy and attitudes about singing. Thus, the research indicates that singing attitudes may not only be important to singing perceptions, but may predict actual singing ability of university students. Unlike previous studies, subject selection was not limited to individuals already participating in singing, but included individuals with little or no participation in organized singing. The results of this study may better represent the general population of university students than some other studies.

Attitudes and context. While the research shows that singing attitudes may be related to participation, motivation, and possibly singing ability, there is one more significant aspect found in the literature concerning singing attitude, and that is context. A number of studies indicate that the context of a singing experience may influence an individual’s attitude about singing. The study by Richards (1999), used attitude to determine the factors influencing participants’ confidence in their ability to sing and to use singing in their classroom. Conducted with a group of 24 elementary education majors, Richards used the Singing Confidence Survey (SCS). Data analysis of the measure revealed that 38% of participants claimed singing was not an activity they enjoyed. However, 95% of the participants reported they would sing along with the radio if no one was listening. This finding indicates that context is an important factor in singing attitudes (Richards, 1999).

Wheaton (2009) also found evidence to support the significance of context to attitudes with her survey of adult self-identified non-singers. She found that even though some individuals identified themselves as non-singers they still reported liking to sing as long as no one was listening (Wheaton, 2009). According to Richards (1999) and Wheaton (2009), individuals’ attitudes about singing changed based on the context of the
singing activity. It also appeared that individuals had a less positive attitude about singing in front of others than they did about singing when no one was listening. Data revealed when individuals take context into account when they determine their attitude about singing. Therefore it is possible that individuals may like singing, but have a negative attitude about singing in front of others.

**Value of singing.** The literature suggests there is one final aspect of singing attitudes, and it is the value an individual places on singing or music in their life. A number of studies found data relating attitudes about singing to the value individuals place on singing. Sichivista (2001, 2007) found that participants’ value of music was the strongest predictor of their intention to participate in choir (Sichivista, 2001).

In 2007, Sichivista found more evidence indicating the value of singing is an important predictor of participation. This study also surveyed university choir students, but unlike the previous study all participants where non-music majors. The goal of the study was to better understand non-music majors motivation to participate in choir the following semester. Data gathered from this study indicates that the more that students’ valued music, the more likely they were to plan future music participation (Sichivista, 2007). The results of both studies (Sichivista, 2001, 2007) suggest that the value of singing in an individual’s life is a significant factor in their motivation to participate in music specifically singing.

Further evidence supporting the significance of the value of singing comes from Susan O’Neil (2002). Like Sichivista (2001, 2007), Susan O’Neil found that an individual’s value of music in their life was important in motivating participants to participate in music (S. O’Neil, 2002). She conducted a longitudinal study with children
during their first year of instrumental study. In the area of practice she reported

In other words, it was the extent to which practice was considered important that contributed to the prediction of time spent practicing and not the extent to which the young musicians’ felt successful and living up to their own and others’ expectations (S. O’Neil, 2002, p. 83).

According to her data, the value of an the individual placed on music determined its priority in their life. It is important to note that S. O’Neil’s data only represents participants studying instrumental music. Therefore caution should be used in apply this evidence to singing. The studies by Sichivista (2001, 2007) and Susan O’Neil suggest that the importance of valuing music is important in one’s relationship to music. Based on the research regarding attitude, emotions, and value it appears that these perceptions are important in understanding the relationship of children, adolescents, and adults to music and singing.

**Predictors of Singing Perceptions**

From the evidence of Peterson (2001), Pfordresher and Brown (2007), and Cuddy et al. (2007) it is clear that a portion of the population mistakenly believes they are unable to sing. In order to understand the reasons behind their inaccurate beliefs, it is essential to discover what factors predict an individual’s perception about their singing. The literature suggests that singing perceptions are predicted by home environment, music learning environment, social comparisons, ethnicity, age, gender, and singing experiences (See Figure 3). For the purposes of this review, studies examining the formation of singing perceptions will be divided according to these predictors.
**Home environment.** Home environment plays an important role in the formation of singing perceptions of individuals especially in the formative years of childhood and adolescence (MacDonald, Hargreaves, & Miell 2002). Eccles (1983) examined the predictors of self-perceptions, and she found that parent and teacher attitudes most affected children’s self-concept or their beliefs about their abilities (Eccles, 1983). Mizener (1993) catalogued ways parent influence children’s singing self-concept. The researcher surveyed 542 elementary students to examine their attitude toward singing and choir participation. In the area of home environment, the researcher found that young children were more likely than older children to report being asked to sing for their family, have family members sing to them, and to report singing with their families (Mizener, 1993). This information suggests there may be a possible relationship between age and home environment that needs to be further explored.
In a study regarding instrumental music practice habits, Sloboda, Davidson, Moore, and Howe (1996) found that parents did play a critical part in children’s musical skill acquisition. They noted that parental support in the early years of instrumental study was vital in order for a child to continue instruction. Later in life, adolescents did not require as much direct parental involvement and were more self-motivated to practice their instrument. Students, however, who lacked parental support in the early years of their instrumental study were much more likely to quit lessons during adolescence. The researcher often found that when adolescents threatened to quit parents would increase support, but increased support later in their life had little affect on students’ decision to continue musical study (Sloboda et al. 1996).

Thus early parental support appears to be extremely important in the study of instrumental music (Sloboda et al. 1996). While these results relate to instrumental music, they also seem to coincide with research by Eccles (1983) and Mizner (1993). Whether or not Sloboda et al.’s (1996) results relate to singing is unclear. Turton and Durrant (2002) found that parental feedback along with that of teacher and peers played a vital role in the formation of singing perceptions. Unlike Sloboda et al.’s research, which reported that parental support in adolescence was not very effective, Turton and Durrant found that positive feedback during adolescence was especially important (Turton & Durrant, 2002).

In a study with adults, Zdzinski and Skok (2000) focused on personal experiences as an influence in an individual’s music perceptions. They surveyed 82 general elementary education majors who volunteered to write a musical autobiography. Through a content analysis of the data, they isolated several categories of influence.
These included family background as well as school experiences and non-school experiences such as concert attendance. Through their examination, they concluded that if musical experiences in any category were positive, then participants were more likely to report a positive attitude about teaching music (Zdzinski & Skok, 2000).

As mentioned previously, Sichivista (2001, 2007) conducted two studies with college students regarding motivation to participate in chorus. In her first study, she found that parental musicianship and support had a significant indirect affect on students’ intentions to continue participation in choir (Sichivista 2001). In another study, Sichivista (2007) surveyed another group of students enrolled in a collegiate choir program. Specifically, data indicated that parental influence in the form of support and the provision of a musical home environment positively affected students’ music self-concept (Sichivista, 2007).

The power of home environment was also evident in the research of Hays (2005). In interviewing 52 elderly Australians about the place of music in their lives, most participants reported that they were introduced to music by a significant other at an early age and continued to love music throughout their lives. Results of surveys with children (Mizener 1993) college students (Sichivista, 2001, 2007; Zdzinski & Skok, 2000), and adults (Hays, 2005; Turton & Durrant, 2002) suggest that home environment, specifically parental support, is an important factor in how individuals regard music and in many cases singing.
Music learning environment. Music learning environment plays a fundamental role in the foundation of singing perceptions (Lamont, 1998/2002; MacDonald et al., 2002). In her study of music identity and school experiences, Lamont suggests that children’s musical identities develop at school between the ages of 5 and 14 years, and that these will be shaped not by the curriculum, but by the traditional defining activities of professional musicians. (Lamont, 2002, p. 46) According to this statement, teachers in particular play an important role in the formation of individual’s musical identities. Ritchie and Williamon (2010) also found that musical instruction could have a positive impact on children. They administered a musical self-efficacy survey to elementary students. Data revealed that participants who had music instruction either instrumental or singing had a much higher level of music self-efficacy then students who had no instruction (Ritchie & Williamon, 2010). A study by Temmerman (1993), reiterates the importance the teacher’s role in the formation of singing perceptions, but this time from an adult perspective. The researcher found that graduating college seniors largely reported school music programs had a significant effect on their adult relationship to music and that most school experiences were unfavorable. Suggestions regarding for improving school experiences included more practical music making and more democratic atmospheres (Temmerman, 1993).

In another study about singing experiences reported by adults, Richards (1999) surveyed pre-service teachers about singing. The majority of participants, who reported they did not enjoy singing, sited negative singing experiences as a major factor in the formation of their preferences. According to participants, these negative singing experiences occurred most often during formal schooling.
This led Richards to state that:

> it is reasonable to expect that preservice teachers' beliefs about singing and the value of singing in education are also based on their own experiences as a student. Most of the students in this sample were able to identify specific positive and negative singing experiences. These tended to come from their formal schooling and may, in part, account for the reason why 41% of the group initially did not view singing as an enjoyable activity. (Richards, 1999, p. 12)

Based on this statement, it appears that formal schooling experiences had a negative impact on beliefs about singing ability.

It is important to note that Richards’ survey concentrated largely on school experiences so it is possible that other experiences could be important in forming singing perceptions, but those were not explored as part of the study. Zdzinski and Shok (2000) identified three types of personal experiences including family, school, and non-school as influential in creating perceptions about music in general. Therefore, more research is needed to clarify which personal experiences are most influential in forming singing perceptions.

Another study supporting the influence of the learning environment on singing perceptions comes from Sichivista (2001). In studying non-music major college choir members, the researcher found that the influence of previous musical experience as well as teacher and peer support accounted for 42% of the variance in students’ future intent to participate in music in her path analysis model. In terms of motivational factors, analysis revealed that intrinsic rather than extrinsic factors were the most influential on student plans for future participation. Also, students who had music instruction in their background were generally more confident about their singing ability and were more likely to consider singing in the future (Sichivista, 2001). Therefore, this data suggests
that the music learning environment may greatly impact students’ motivation to participate as well as their singing perceptions.

All the studies mentioned previously in this section, found that the music learning environment to be significant. Turton and Durrant’s (2002) offer an important perspective on the music learning environment because the entire study focused on the singing experiences in English school system as reported by a random sample of adults. The study investigated participants’ level of enjoyment of singing in school, reasons participants did not like singing in school, current singing involvement, types of music sung in schools, songs participants remembered singing, and reasons given for remembering, impressions of singing teachers, and participant’s self perceptions of their own singing voice.

In examining the results, the researcher found that the three main reasons participants did not like school singing was because they felt the teacher was not a good instructor, the participant did not like the music, and/or they were insecure about their voice. Participants remembered enthusiastic teachers the most positively, and the researcher found that feedback from teachers as well as peers and family was important to participants especially during adolescence (Turton & Durrant, 2002).

In a similar study, Ruismaki and Tereska (2008) investigated the music experiences of Finnish adults. They found singing was the most popular activity in school. Additionally, reports from individuals indicated that some of their most negative memories involved experiences with teachers who had a high turnover rate, were ill-prepared, and did not seem committed to their subject (Ruismaki & Tereska, 2008). This is further evidence that the music learning environment, especially students’ opinions
about teachers, has an impact on the singing perceptions of individuals (Ruismaki & Tereska, 2008; Turton & Durrant, 2002).

Another aspect of the relationship between singing perceptions and the music learning environment comes from studies focusing on singing anxiety or poor singing perceptions. These qualitative studies examined individuals who either had anxiety about singing or considered themselves tone deaf (Abril, 2007; Whidden, 2009). In the first, Abril (2007) conducted a case study of three elementary education college students who reported anxiety about singing during a required music course. In analyzing their interview data, Abril found all three participants had negative school experiences with singing in early adolescence. These negative experiences left lasting impressions on their singing perceptions, which affected their singing behaviors both in and outside the class (Abril, 2007).

Whidden (2009) also conducted a study examining five self-identified adult nonsingers using qualitative methods. Within a series of one on one interviews, she found that negative comments from authority figures about individual’s singing abilities created negative impressions that lasted throughout the participants lives (Whidden, 2009). These two in depth examinations regarding individuals with negative singing perceptions reveal that music learning environments especially authority figures can have a harmful impact on individuals’ singing perceptions.

Data supporting the research of Abril (2007) and Whidden (2009) about the impact of music learning environment, also comes from quantitative research. Cuddy et al. (2005) investigated participants identifying themselves as tone deaf through a survey about singing perceptions. The researchers found that previous musical instruction was a
factor in predictions of self-reported tone deafness (Cuddy et al., 2005). While this data is not as specific as some of the other studies mentioned in this section, it indicates that the music learning environment have an impact on the formation of negative singing perceptions. Therefore, based on the results of numerous studies, research suggests that teachers and school experiences are significant factors in the formation of singing perceptions (Abril, 2007; Cuddy et al., 2005; Whidden, 2009; Zdzinski & Skok, 2000).

**Social comparisons.** When examining individual’s relationship to singing, research shows that social comparisons are predictors of singing perceptions (Sloboda et al., 2005). MacDonald and others had this to say about the importance of social comparisons in their book *Musical Identities*:

> the self-image develops by a process of monitoring our own behavior, and making social comparisons. We constantly compare ourselves with others, so that particular situations and social groups exert a powerful influence on what we do and what we say. We also compare our behavior with what we expect ourselves to do on the basis of our self-image, which is built up from past experience, and with what we would like to do, i.e. with our ideal self-image. (MacDonald et al., 2002, p. 8)

**Peer influence.** Social comparisons encompass many aspects of an individuals life. Research reveals, however, that peer influence can be a critical factor in the decisions of adolescents. There are several studies that provide data regarding the impact of peers on singing perceptions. One study (Lamont, 2002) concerning children’s identity pointed out that music identities are shaped by group comparisons. This study also found that peer influence in middle childhood became especially instrumental in the formation of self-identity (Lamont, 2002). Data from another research study (S. O’Neil, 2002) revealed that peer support found at special music schools was helpful for high achieving music students during their first year of instrumental instruction. Interestingly,
low achieving music students at the same special music schools, reported the peer
influence was negative and described the atmosphere as extremely competitive and
unsupportive (S. O’Neil, 2002). This suggests a relationship with the positive or negative
impact of peer influence being determined not by the peers, but by the achievement of the
individual. This study concerned students studying instrumental music. Therefore it is
unclear if the same results would be found when surveying students studying or
participating in singing.

One such study offers possible insight into the relationship between peer
influence and singing participations. Kennedy (2002) discovered that peers exerted a
strong influence on the decision to participate in choir especially for boys. Kennedy
stated:

by far the majority of comments concerned social aspects of the choir class.
Informants placed high value on friendships, the group experience, and field trips.
Friendships could be same sex or opposite sex. Darryl spoke of opportunities to
"meet new people from other choirs and stuff . . . girls . . .!". Bob referred to "all
the friendly people that happen to be in choir . . . Last year I came in and I didn’t
know nobody, but as soon as I continued on with it, I met a lot of people and it
was pretty cool". Cross-grade mentoring friendships were a significant part of the
social dynamics of the vocal ensemble. Both boys and girls mentioned the
importance of having students from different grades in the choir. Developing
associations with people one wouldn’t normally meet was one stated benefit.
Support was another. Fraternal mentoring friendships were easily visible in the
classroom. The relaxed repartee I observed between Robert and Matt over the
oversized blazer ‘costume’ was evidence of one such friendship. (Kennedy, 2002,
p. 33)

These results highlight the social dynamics of choir and singing. They do not specifically
speak to vocal perceptions, but research shows that participation is an important part of
improving the voice and perceptions formed during the adolescence period can be lasting
(Fuchs, 2007; Turton & Durrant, 2002).
In another study tying peer influence to singing participation, Sichivista (2007) examined the motivation of choir students. As reported earlier in this review, the researcher found music value was the number one predictor of future choir participation. Thus the formation of an individual’s value of music is significant, and the researcher found students’ peers, their parents, and their musical background were the most influential factors in determining the value of music in students’ lives (Sichivista, 2007). Thus according to research peer influence exerts a great deal of influence on both motivation to participate in singing and in perceptions about one’s singing (Kennedy, 2002; S. O’Neil, 2002; Sichivista, 2007).

In contrast to the studies above, one study found that peer influence was not a significant predictor of student’s involvement in singing. Neill (1998) surveyed participants of Missouri all-state choirs as well as students at a few randomly selected choral programs in Missouri. Students reported that a love of singing and performance were the main reason they participated. This supports the research of Sichivista (2001, 2007) on the significance of the value of music in an individuals’ life. Students did not report peer influence as a significant factor in their decisions (Neill, 1998). These results contradict all the other research on peer influence in singing participation. It is not clear why this study contradicts all the other evidence on peer influence and music participation. Further study on this topic may provide more clarity on the discrepancy in the research regarding peer influence.

**Other social comparisons.** While the majority of studies focused on peer influence, there was some data found about other types of social comparisons. Turton and Durrant (2002) examined a variety of social comparisons in trying to determine
which were most influential in participants’ perceptions about their voice. Participants listed two significant social comparisons that influenced the formation of their vocal perceptions in adolescence. The first was the participant’s judgment of his or her own voice compared to a vocal model. The second was positive recognition in comparison to others such as selection for spot in an auditioned ensemble. Conversely adults reported that feedback from peers as well as family and teachers was the most essential element in forming singing perceptions (Turton & Durrant, 2002). Thus it appears that social comparisons are significant factors in the formation of singing perceptions. The type of social comparison that is most influential may be dependent on age or the individual.

Sloboda et al. (2005) like Turton and Durrant uncovered that several different types of social comparisons were significant in establishing singing perceptions. Interviewing 12 individuals to determine why they labeled themselves as tone deaf, Sloboda et al. discovered singing perceptions were socially based around three main types of comparisons. First, people who thought they were bad singers or tone deaf often compared themselves to others to gauge their own abilities. Secondly, many people claimed that musically trained or talented people had specialized knowledge that allowed them to perceive music better than unmusical people. Finally, participants reported a lack of confidence in their voice. This was mainly attributed to their reported difficulty in perceiving if they were on pitch. Participants did not want to sing because they could not tell if they were singing correctly, and they were embarrassed because they thought someone would discover they were not on singing pitch (Sloboda et al. 2005). These results led Sloboda et al. (2005) to emphasize the importance of social comparisons in the development of singing perceptions. In conclusion based on the research, social
comparisons from peer influence to individuals’ comparison to vocal models appear to be
significant predictors of singing perceptions (Fuchs, 2007; Kennedy, 2002; Lamont, 2002;
MacDonald et al., 2002; Neill, 1998; S. O’Neil, 2002; Sichivista, 2001, 2007; Turton &
Durrant, 2002).

**Gender, age, and ethnicity.**

**Gender.** Research regarding singing perceptions proposes that age, gender, and
ethnicity can influence what individuals think about their singing. Several studies found
results differed based on the gender of participants. As mentioned earlier, Eccles (1993)
examined music competency beliefs in elementary students. The researcher found that
self-efficacy beliefs were solidly formed by 1st grade. As children aged they became less
confident about their music competency. Overall girls reported being more confident in
their music competency beliefs than boys (Eccles, 1993). In a very similar study Ritchie
and Williamon (2010) examined music self-efficacy in elementary students. Like Eccles,
er her data revealed that girls’ music self-efficacy beliefs were significantly higher than
boys (Ritchie & Williamon, 2010).

Mizener (1993) surveyed elementary students to determine their musical
perceptions using the predictors of gender, grade level, home environment, musical
experiences, and perceived singing ability. Her results indicated that younger children
appeared to have more positive self-perceptions than older children. She found
differences in gender in relation to attitude toward singing. Girls reported enjoying
singing much more often than boys. Results concerning predictors of self-perceptions
were not explicitly investigated (Mizener, 1993).
Campbell (2010) also found gender differences when surveying adolescents to determine how current participation might predict future participation. In the study, girls who were involved in instrumental study at the time of the study were more likely to report they would consider participating in other types of musical activities like singing in the future. Boys reported the opposite. If boys were currently involved in choir, they would be more likely to report considering participation in other musical activities in the future like instrumental ensembles (Campbell, 2010). The researcher theorized these results could be due to the fact that it was more common for girls to be involved in choir and boys to be involved in instrumental ensembles. Thus if girls or boys were going against gender typical activities, it might mean that music was especially important to them thus they wanted more opportunities to participate in multiple music activities.

**Age and ethnicity.** Turton and Durrant (2002) found that positive feedback was especially influential to attitudes about singing during adolescence. As mentioned in the previous section, the age of an individual determined what social comparisons were most important to singing perceptions. Ruismaki and Tereska (2008) like Mizener also chronicled attitudes over time. They discovered that attitudes about music were the most positive in the four to six age group, became more negative in adolescence, then more positive again in late adolescence (Ruismaki & Tereska, 2008). Unlike other studies with elementary children (Eccles, 1993; Mizener, 1993; Ruismaki & Tereska, 2008), Siebenaler (2008) included the variables of ethnicity, age, and gender. The study confirmed some of Mizener’s research. From surveys of 249 elementary students, the data revealed that gender, age, and ethnicity all affected student’s attitudes about singing and acted as predictors for their singing perceptions (Siebenaler, 2008).
In the case of age and gender, older students were less positive about singing, and girls were more positive than boys (Siebenaler, 2008). Data also revealed differences across both gender and ethnic groups. Overall African-American boys and girls were more receptive to singing than Hispanic students. When examining the boys who participated, African American boys were the most confident about their singing abilities (Siebenaler, 2008). Of the children surveyed, Hispanic boys had the lowest confidence level for singing, and they had the least reported incidents of singing when no one was listening (Siebenaler, 2008).

The only other study that examined ethnicity was a study with African American adolescents. Chinn (1997) found that ethnicity played a role in singing perceptions. The researcher surveyed participants about cultural trust, singing self-concept, and singing self-identity through vocal models. The results revealed that cultural influences and traditions had an effect on singing tasks and on the self-perceptions of the singer (Chinn, 1997). Chinn (1997) and Siebenaler (2008) both found evidence that singing perceptions were affected by ethnicity.

Therefore according to the literature related to children and adolescent’s singing perceptions and abilities, age, gender, and ethnicity play a role in what an individual perceives about their voice and their vocal abilities. Therefore researchers found evidence that age and gender affect singing perceptions (Eccles, 1993; Mizener, 1993; Ruismaki & Tereska, 2008; Siebenaler, 2008; Turton & Durrant, 2002). In addition to gender and age, Siebenaler (2008) and Chinn (1997) discovered that ethnicity also played a role in singing perceptions.
Singing experiences. Understanding current perceptions about singing as well as discovering how individuals develop these perceptions helps to create a clearer picture of an individual’s singing beliefs. MacDonald et al. (2002) suggest in their book that musical experiences are the ingredients that make up musical identity. Thus according to this statement singing experiences are a vital predictor of singing perceptions. Home and school experiences have already been discussed in this review. This section will therefore discuss the effects of singing participation that occur outside of home and school. Additionally, any studies found that deal with music and singing participation in a non-specific or general context will be discussed.

There are several studies that have explored how singing perceptions affect participation in singing activities. One of the first was what could be termed an action research project by Greenberg in 1970. The purpose of the study was to determine the causation for negative singing self-image. Another goal was to find a treatment for the psychological and emotional blocks to singing. Greenberg identified ten boys at an elementary school who wished to participate in singing, but who had difficulty in matching pitch. The boys were allowed to participate in the 84 voice auditioned elementary chorus. They were not given any additional remedial treatment beyond participation in the chorus (Greenburg, 1970).

A researcher created questionnaire surveyed the students about their singing perceptions. As another part of the study, the students’ classroom teachers also evaluated the students’ social skills. The results indicated that the majority of the participants had poor peer relationships, were academically underachieving, and had few or unrealistic ideas about themselves. This led Greenberg to theorize that psychological
factors rather than physical may have contributed to the participants’ inability to match pitch.

Greenberg also tested the boys pitch matching skills. Data indicated that after a semester in the chorus, four of the boys made no significant progress in their ability to consistently match pitch. Five of the participants did make significant gains in matching pitch and one boy made moderate progress. Therefore, roughly half of the participants improved their singing significantly just through participation. Greenberg did not do a post-test regarding singing self-image. This type of post-test would have provided interesting evidence about how participation changes self-concept. Despite this missing measure, it appears that participation is important to improving singing (Greenburg, 1970).

Mizener (1993) tested 542 elementary students for singing accuracy and surveyed them about their singing perceptions to determine the effect of perceptions on participation in music activities. A questionnaire gathered students’ singing perceptions and catalogued their music participation while taped performances assessed singing accuracy.

Findings in the present study suggest that factors other than singing accuracy may determine a child’s attitude toward singing and choir participation. The results of the present study support previous research indicating that students generally like singing activities. Results also indicate that participation in certain musical activities and experiences at school and at home tend to be associated with positive attitudes toward singing and toward choir participation. (Mizener, 1993, p. 244)

According to Mizener, participation in music influences children’s perception about singing and their attitude toward singing activities even above their ability to sing.
Neill (1998) also found that singing experiences were important to high school students in choral programs and the Missouri all-state choir. Surveyed student gave three main reasons for singing. The first was they liked singing. Secondly, they liked performing. In addition to these two reasons, they cited previous performances as well as reputation of program as reasons to justify their participation in choir. This reveals that like the research on children, singing experiences of adolescents appear to have an impact on their participation and possibly singing perceptions.

As mentioned in the home environment section of this review, Zdzinski and Skok (2000) conducted a study with general elementary education majors. The participants were asked to write a musical autobiography. Analysis of these autobiographies found that non-school experiences such as concert attendance as well as family background and school experiences had an affect on participants’ attitude toward music. Specifically if the musical experiences were positive, then participants were more likely to have a positive attitude about teaching music (Zdzinski & Skok, 2000).

In another study connecting participation in singing with the formation of singing perceptions, Hedden (2007) surveyed 187 elementary students about a county elementary honor choir festival. The purpose of the study was to determine what internal or external factors affected fourth and fifth graders’ decision to participate or to not participate in an honor choir festival. All students enrolled in the county’s elementary schools were given an opportunity to indicate interest in participating in the honor choir. Elementary music teachers at each school chose 8 to 12 students to actually participate.

The results of the survey indicated that students participating in an honor choir were more likely than nonparticipants to have positive attitudes about their singing
abilities, report liking to sing, and to be involved in other music activities (Hedden, 2007). Encouragement from teachers and parents also factored in student participation. Hedden placed greater emphasis on the positive attitudes toward singing by participants as a motivation for their participation. In contrast, 85% of non-participants in this study claimed they liked singing. They were less positive, however, about their ability to sing than students participating in the choir (Hedden, 2007).

Interestingly, students not participating in the honor choir reported a higher incidence of singing on their own with recordings than students in the honor choir. The researcher speculated that this might be due to lack of confidence in their singing resulting in their feeling more comfortable singing by themselves and not in front of others. In summary, the results from both student groups in Hedden’s study indicate that participation in a singing event might be linked to elementary students’ belief about their singing abilities (Hedden, 2007).

Not all singing experiences lead to participation. Abril (2007) discovered that negative singing experiences during adolescence could impact adult singing attitudes and behavior. In a qualitative investigation of five non-singers, Whidden (2009) found that participants claimed childhood experiences where authority figures criticized their singing caused them to believe they could not sing for the remainder of their lives (Whidden, 2009). Thus, just as positive experiences can encourage singing (Greenburg, 1970) negative experiences can leave lasting impressions and prevent people from singing for long periods of time (Abril, 2007; Whidden, 2009).

Most recently, in the study of singing perceptions, Campbell (2010) explored a possible relationship between music participation and self-efficacy. Working with 199
middle school students, Campbell created a questionnaire to gain information about students’ music possible selves. This is the term she used to describe students’ current music participation and their opinion about their singing ability. A second section of the questionnaire explored what she termed future music selves or plans students had for future music participation. Campbell’s main purpose was to discover if students’ current beliefs about students’ singing and music participation had an effect on their plans for future music activities (Campbell, 2010).

The data from the survey revealed that current participation in music was highly correlated with future participation. Thus, students who were a part of music activities were much more likely to report they thought about participating in future music activities (Campbell, 2010). Additionally, students who participated in music were more likely to have a positive view of their musicianship. Students who did not participate in music activities were less likely to have a positive view of their musicianship and less likely to consider participating in music in the future (Campbell, 2010). According to these results levels of participation appear to influence students’ singing concept just as self-concept affects the level of participation.

Campbell’s results appear to support a theory presented by Wise and Sloboda that a negative music self-concept coupled with a low level of participation created a vicious cycle for uncertain singers or musicians (Wise & Sloboda, 2008). Thus based on the evidence from Campbell, it is possible that if a student has a strong musical self-concept then they will most likely seek to participate in more musical activities, which will enhance their performance abilities and strengthen their musical self-concept. In conclusion, research data indicates a strong relationship between perceptions about
singing and participation in music (Campbell, 2010; Greenburg, 1970; Hedden, 2007; Mizener, 1993).

**Summary**

Singing abilities in the general population. The purpose of this study was to investigate predictors of self-labeled singers and non-singers’ beliefs about singing across their lifetime with the additional goal of exploring a theoretical model of singing perceptions. In order to understand singing perceptions it is necessary to first investigate singing abilities in the general population. Research reveals that between 4-7% of the general population suffers from amusia, a condition that prevents people who are otherwise healthy from being able to sing (Gravetter & Wallnau, 2006; Henry, 2010; Kalmus & Fry, 1980; Peretz et al., 2003). It may then be assumed that around 90% of the population has the ability to sing. Studies investigating the singing ability of the general population disagree, but estimate that between 17-39% of the population are poor singers (Dalla Bella et al., 2007; Pfordresher & Brown, 2007; Price, 2000).

Of more concern than the number of poor singers, is evidence that between 40-80% of study participants inaccurately labeled themselves as tone deaf (Cuddy et al., 2005; Pfordresher & Brown, 2007; Sloboda et al., 2005; Wheaton, 1998; Wise & Sloboda, 2008). Even more disturbing according to Sloboda et al. (2005), people labeling themselves as tone deaf believe they have a permanent condition that prevents them from singing. Research reveals, however, that a majority of people can sing and with specialized instruction even poor singers can improve their singing ability (Cuddy et al., 2005; Sloboda et al., 2005; Wise & Sloboda, 2008). In order to understand why so many people label themselves as tone deaf and prevent other from forming inaccurate
beliefs about their singing, it is important to have a clear understanding about the individual’s relationship to singing.

**Singing perceptions.** There are a number of ways that researchers have described how people relate to singing (Lillemyr, 1982, 1983). Many researchers agree that the relationship between individuals and singing is complex (Monk, 2003; Wise & Sloboda, 2008), and in this study, the term singing perceptions was selected to represent this complex relationship (Haskell, 1987; Lillemyr, 1982, 1983; Wheaton, 1998) After reviewing the literature, a possible conceptualization of singing perceptions was created, which divided perceptions into three categories: singing self-concept, self-efficacy, and singing attitude. The hope is that this theoretical model of singing perceptions will help to better explore all aspects of an individual’s relationship to singing. Singing self-concept in this study represents a person’s domain specific identity to singing (Song & Hattie, 1984, 1985). Studies regarding singing self-concept found that singing is often related to ideas about one’s self or self-image (Hays, 2005; S. O’Neil, 2002; MacDonald et al., 2002; Monks, 2003; Parker, 2009). Sloboda et al. (2005) and Wise and Sloboda (2008) theorized that a negative singing self-concept could have physical ramifications, which could make successful singing difficult.

The second part of singing perceptions is self-efficacy or an individual’s belief in his or her ability to sing. Much of the research regarding self-efficacy comes from attribution or motivation literature, which reveals that self-efficacy beliefs may be related to motivation to participation in an activity, cognitive approaches to music, and an individual’s emotions about singing (Asmus, 1986, 1990; Cuddy et al., 2005; Eccles, 1983; Goetz et al., 2010; S. O’Neil, 2002; Simpkins et al., 2010; Wigfield et al., 1997).
Finally, the third part of singing perceptions is an individual’s attitude toward singing, which represents affective responses to singing and the value individuals place on singing in their life. According to research, attitudes about singing affect participation, singing perceptions, and are contextually based (Kennedy, 2002; Neill, 1998; Peterson, 2001; Richards, 1999; Ruismaki & Tereska, 2008; Simpkins et al., 2010; Turton & Durrant, 2002; Wheaton, 2009) the value of singing is an important predictor of singing participation and singing’s place in an individual’s life (Cuddy et al., 2005; S. O’Neil, 2002; Sichivista, 2001, 2007).

**Singing perception predictors.** The literature suggests that singing perceptions are affected by home environment, music learning environment, social comparisons, ethnicity, age, gender, and singing experiences. Home environment represents the support and influence of family over an individual. Several studies found that home environment was a significant predictor of singing perceptions (Eccles, 1983; Hays, 2005; Mizener, 1993; Sichivista, 2001, 2007; Sloboda et al. 1996; Turton & Durrant, 2005; Zdzinski & Skok, 2000). Another predictor of singing perceptions according to researchers was the musical learning environment or all singing experiences with teachers or instruction at school or in the community (Lamont, 1998; Temmerman, 1993; MacDonald et al., 2002; Richards, 1999; Ritchie & Williamon, 2010; Ruismaki & Tereska, 2008; Turton & Durrant, 2002; Zdzinski & Skok, 2000) Some studies reported that school experiences had negative influence on individuals’ singing perceptions (Abril, 2007; Ruismaki & Tereska, 2008; Whidden, 2009).

Social comparisons or comparing one’s singing to that of others whether it be peers or other vocal models were also revealed as predictors of singing perceptions
(Kennedy, 2002; Lamont, 1998/2002; MacDonald et al., 2002; Neill, 1998; S. O’Neil, 2002; Sichivista, 2007; Sloboda et al., 2005; Turton & Durrant, 2002). The predictors of gender (Campbell, 2010; Eccles, 1993; Mizener, 1993; Siebenaler, 2008; Ritchie & Williamon, 2010), age (Eccles, 1993; Mizener, 1993, Ruismaki & Tereska, 2008; Siebenaler, 2008; Turton & Durrant, 2002) and ethnicity (Chinn, 1997; Siebenaler, 2008) were also found in several studies to be predictors of singing perceptions. There were a number of studies that investigated singing experiences that were outside of home or school or explored singing experiences as a general topic. Most found that singing experiences were predictors of singing perceptions by encouraging singing participation (Campbell, 2010; Hedden, 2007; Greenburg, 1970; Mizener, 1993; Neill, 1998), leaving both positive (Greenburg, 1970; Hedden, 2007) and negative (Abril, 2007; Whidden, 2009) impressions of singing, and predicted future singing participation (Campbell, 2010; Sichivista, 2001, 2007). In conclusion, research indicates that there are a significant number of people who inaccurately believe they cannot sing. By examining singing perceptions, which this study suggests comprise of singing self-concept, singing self-efficacy, and attitudes toward singing, and by investigating the predictors of singing perceptions, it is hoped to establish a better understanding of how individuals relate to singing.
Chapter 3

Method

The purpose of this study was to investigate the singing perceptions of self-labeled singers and non-singers, and to identify predictors of their singing beliefs with the additional goal of testing a conceptual model of singing perceptions. Through this study, it is hoped to gain a better understanding about the formation and role of singing self-perceptions in college-age students. Furthermore, the specific factors underlying singing perceptions were clarified. This investigation proceeded as follows: (a) a measure of singing perceptions and participation was created, checked for validity, and piloted then checked for reliability (b) the revised measure was administered to college students, (c) collected data was analyzed and presented.

Participants

In order to examine the perceptions regarding singing, participants included college students enrolled in an undergraduate psychology or music appreciation courses at a major university. These classes are required for several degree programs, which helped insure that the sample reflected a group of people with differentiated interests, majors, and backgrounds. To ensure a large enough sample to enable adequate data analysis, the target participation was 150 or more students. This estimate ensured that the twelve items related to the factor analysis had the required three participants to each item ratio suggested by Asmus (1989). Additionally, the G*Power 3.1: Tests for correlation and regression analyses, was used to establish that a sample size of no less than 150 participants was needed to ensure an adequate power level of 0.80 (Faul, Erdfelder, Buchner, & Lang, 2009).
In order to recruit students to participate in the study, in-tact undergraduate classes open to university students of all majors were considered for participation in the study. Several classes in the music and psychology departments were selected based on class size and variety of students. Five professors teaching either psychology or music appreciation courses were emailed and asked if they would allow their students to participate in this study. Of the original five professors contacted, three professors replied in the affirmative. The two professors who replied in the negative were unable to have their students participate because the classes best fitting the required sample met only in the fall semester.

Those professors able and willing to participate included one professor teaching Psychology of Gender and Personality course with 51 students enrolled and two professors teaching music appreciation courses. One of the music professors had an enrollment of 338 students between two courses: Evolution of Rock and Evolution of Jazz. The other music professor had an enrollment of 38 students for the Understanding Music Course. Students enrolled in these music appreciation courses were non-music majors. The total enrollment of all classes surveyed was 427 students. Students who responded to the survey included 172 students, which resulted in a 40% response rate for this study.

**Participant demographics.** Participant demographic characteristics were analyzed using descriptive statistics computed by the Statistical Package for the Social Sciences (SPSS) version 18.0 program. Results of the descriptive analysis, presented in Table 1, included number of participants ($n$), standard deviation ($SD$), and percentage (%).
Table 1

Participant Demographics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total (n= 170)</th>
<th>Frequency</th>
<th>Percentage</th>
<th>M (±SD)</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Total</td>
<td>n= 170</td>
<td>89</td>
<td>52%</td>
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<tr>
<td>18-20 yrs</td>
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<td>81</td>
<td>47%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-26 yrs</td>
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<td></td>
<td></td>
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<tr>
<td>Gender</td>
<td>n= 169</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td>80</td>
<td>47%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td>89</td>
<td>51%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing</td>
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<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td>n= 169</td>
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<td></td>
</tr>
<tr>
<td>American Indian or</td>
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<td>0</td>
<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native Alaskan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td></td>
<td>13</td>
<td>8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black or African American</td>
<td></td>
<td>15</td>
<td>9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td></td>
<td>88</td>
<td>52%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td>26</td>
<td>15%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native Hawaiian or</td>
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<td>0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Pacific Islander</td>
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<td>1</td>
<td>0.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two or More Races</td>
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<td>20</td>
<td>12%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
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<td>6</td>
<td>4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
<td>1</td>
<td>0.5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Definition of Variables**

**Dependent Variable.** The dependent variables of this study encompassed the term singing perceptions (Haskell, 1987; Wheaton, 1998). This term referred to the way an individual cognitively and affectively related to singing. Research question one sought to clarify the factors encompassed in singing perceptions. Based on a review of the literature, a conceptualization of singing perceptions was suggested. This conceptualization proposed that singing perceptions comprised three parts: singing identity, singing self-efficacy, and singing attitude. For the purpose of this study, singing identity is also known as a domain specific self-identity of singing (Eccles, 1993;

The term “singing self-efficacy,” in this study, referred to an individual’s belief in their ability to successfully complete a singing task (Bandura, 1977; Bong & Skaavlik, 2003). Finally, singing attitudes represented a person’s affective response to singing (Lamont, 1998). Specifically, attitudes were operationally defined as encompassing both feelings toward singing and beliefs about the value of singing as an activity (Lamont, 1998; Richards, 1999; Sichivista, 2007; Siebenaler, 2008; Wheaton, 1998). Justification for the incorporation of attitude in the definition of singing perceptions came from multiple studies (Cuddy et al., 2005; Hedden, 2007; Lamont, 1998; Mizener, 1993; Peterson, 2001; Richards, 1999; Ruismaki & Tereska, 2008; Siebenaler, 2008; Turton & Durrant, 2002; Wheaton, 1998). The research seemed to indicate singing perceptions were composed of three parts. An exploratory factor analysis, however, was used to determine the actual composition of singing perceptions.

**Independent variables.** Independent variables in this study served as predictors of singing perceptions. Research regarding the formation of singing perceptions identified a number of different predictors. These include home environment, music learning environment, social comparisons, ethnicity, age, gender, and singing experiences (Cuddy et al., 2005; MacDonald et. al, 2002; Sloboda, Wise, & Peretz, 2005; Turton & Durrant, 2002; Zdzinski & Skok, 2000).
Home environment. For the purpose of this study, home environment referred to parental and familial support of singing both in the home and outside the home. It also explored how often parents sing to or with their children (Eccles, 1983; Hays, 2005; Mizener, 1993; Sichivista, 2001, 2007; Sloboda et al. 1996; Turton & Durrant, 2005; Zdzinski & Skok, 2000).

Music learning environment. The musical learning environment referred to any singing events, memories, interactions, or experiences related to teachers and formal music instruction in school, in private lessons, or through community or religious singing programs (Cuddy et al., 2005; MacDonald et al., 2002; Mills, 2010; Ruismaki & Tereska, 2008; Siebenaler, 2008; Turton & Durrant, 2002; Zdzinski & Skok, 2000).

Social comparisons. Social comparisons were defined in this study as any time that an individuals compare their singing performance with another person’s singing performance (MacDonald et al., 2002). This included comparisons with peers and other singers both amateur and professional (Mills, 2010; Sloboda, Davidson, & Howe, 1996; Turton & Durrant, 2002). Comparisons were made irrespective to time or location and they could be made while in a group or when an individual sings by themselves (Chinn, 1997; MacDonald et al., 2002; Sloboda et al., 2005). This section of the measure also investigated the influence of peers in regard to both negative and positive feedback. Fear of negative comments by peers or poor social comparisons to others led to singing anxiety (Abril, 2007; Richards, 1999; Wheaton, 2009). Results from this section will help music educators better understand the power of social comparisons in relation to singing perceptions.
**Ethnicity, age, and gender.** The term ethnicity encompassed both a person’s race and singing perceptions that reflected the ideas of the ethnic background and cultural heritage to which they relate (Chinn, 1997; Siebenaler, 2008). Age referred to any singing perception including attitude about singing, belief regarding singing self-efficacy, and singing identity, which might be specific to a particular age group. Research by Ruismaki & Tereska, (2008) as well as that by Mizener (1993) indicated that singing perceptions changed throughout childhood and adolescence. Gender referred to an individuals’ singing identity in relation to if they are either female or male (Siebenaler, 2008).

**Singing experiences.** Singing experiences referred to any observation of or participation with singing (“Merriam-Webster Online,” 2010; Zdzinski & Skok, (2000);). This includes memories of singing (Sloboda, 2005) or actively listening to singing (Cuddy et al., 2005). Participation was also a part of singing experiences and encompassed not only participation in singing activities in groups and alone (Fuchs, Meuret, Thiel, Taschner, Dietz, & Gelbrich, 2007; Sichivista, 2007), but also opportunities to participate in singing (Greenburg, 1970) and success or failure in singing performances (Asmus, 1990; Maehr, 1983). An investigation of performance anxiety was not a focus of this study. However, in exploring negative and positive singing experiences in this section of the measure, it is hoped to better understand beliefs that might lead to anxiety about singing.

**Measure Development**

Many sources provided information used in the creation of the *Singing Perceptions and Participation Survey* (SPP). For exact references regarding creation of
each item, please see Table 3.1. The main examples of item types used in the SSP came from surveys by Bong and Skaavlik (2003), Mizener (1993), Siebenaler (2008), and Vispoel (1996). Specifically, Bong and Skaavlik’s (2003) article on self-concept and self-efficacy provided insight into creation of items related to self-efficacy. The research of Siebenaler (2008) provided inspiration for measure items related to the value of music. A study by Mizener (1993) provided information regarding items related to measuring singing attitudes and participation. Finally, a survey on singing by Vispoel (1996), served as inspiration for the general length and nature of items related to individual’s attitudes about singing. The survey was divided into 4 parts: Singing Perceptions, Singing Influences, Singing Experiences, Singing Identity, and, Demographics,

Table of specifications.

Table 2

<table>
<thead>
<tr>
<th>SINGING PERCEPTIONS (Research Question 1 a, b, c, and d; 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content Area</strong></td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
</tr>
<tr>
<td><em>Singing Attitudes</em></td>
</tr>
<tr>
<td>Enjoyment</td>
</tr>
<tr>
<td>Value</td>
</tr>
<tr>
<td><strong>Self-Efficacy</strong></td>
</tr>
<tr>
<td>Ability</td>
</tr>
<tr>
<td>Confidence in specific situation</td>
</tr>
<tr>
<td>Compare to others</td>
</tr>
</tbody>
</table>


The *Singing Perceptions* section, investigated participants’ singing identity, beliefs about their ability to sing (self-efficacy), and their attitude toward singing as well as the importance they place on singing in their life (attitude). The *Singing Influences* section of the survey included items related to home environment, music learning environment, and social comparisons. As Zdzinski and Shok (2000) as well as Sichivista
(2007) pointed out, home environment plays an important role in singing participation; several questions gathered evidence about home environment. These included inquiries about the attitudes of participants’ families toward participation in singing and about family members current and past participation in singing. The *Singing Experiences* section of the survey addressed singing experiences and information regarding participants’ past and current singing experiences. The *Singing Identity* section related to the specific identity the participant related to as well as qualitative items about their most influential singing experiences. The *Demographics* section of the SPP collected data pertaining to participants’ age, gender, and ethnicity.

**Pilot test.** A pilot test was performed with college students (*n*=19) in order to ensure that all items were appropriate and clear. All pilot participants filled out the survey online through the Survey Monkey website. Items were adjusted accordingly relative to the findings of the pilot study. The pilot singing perception items had a Cronbach’s alpha reliability coefficient of .80. In order to establish validity, two college age self-identified non-singers, who had never participated any formal music activities nor receive formal music training, examined the measure for relevance to non-singers. Additionally, four experts in the field of music, psychology, statistics, and survey development examined the measure for content and accuracy. Corrections proposed by the reviewers were added to the measure in order to clarify all items.

**Final measure reliability.** After the measure was administered, reliability was tested again and the singing perceptions items had a Cronbach’s alpha reliability coefficient of .90. The increase in the reliability was due to the difference in sample size between the pilot group and the final sample.
Data Collection Procedures

The researcher worked with instructors in the University of Miami Psychology Department and the Frost School of Music to encourage participation from students enrolled in introduction to psychology and music appreciation courses. In order to reach the largest number of potential participants in the most efficient manner, the survey was administered through paper to participants from the psychology course and online through the Survey Monkey website to students in the music appreciation courses. An email containing a link to the survey posted online was sent to each participant. The link included an informed consent letter stating the purpose of the study and explaining that participation was voluntary. The Internal Review Board did not require signed letters of consent because of the non-risk nature of the study. Therefore the consent letter stated that filling out the survey constituted consent to participate in the study (See Appendix B).

As an incentive to complete the study, participants were entered into one of two random drawings for a $50.00 gift card. One for all online participants and one for all participants filing out the paper survey. The survey was submitted anonymously unless participants chose to take part in a drawing. Participants wishing to take part in the drawing were asked to provide their name and email addresses so that they could be contacted in the event they won. No data from the survey was connected to contact information provided by participants for entry. No faculty or students were in anyway penalized for non-participation in this study.
Data Analysis

**Research question one part a, b, c, and d.** Research question one inquired: what are the factors that make-up the current singing perceptions of college students at a major university? There were four subparts to the question. (a) What was their singing self-concept? (b) What was their current level of singing self-efficacy? (c) What was their attitude toward singing? (d) How did singing self-concept, singing self-efficacy, and attitude toward singing relate to singing perceptions? Descriptive statistics including mean, median, and mode as well as frequencies were used to analyze data from research question one part a, b, and c. Composite variables were created for singing self-efficacy and singing attitude by summing all of the SPP items pertaining to each of those variable. A variable specific score was calculated for each participant and reported along with measures of central tendency for that variable. Finally, an exploratory factorial analysis was performed on the first 12 items to determine the factors comprising singing perceptions, and to answer research question one part d.

**Research question two.** How do home environment, music learning environment, social comparisons, race/ethnicity, age, gender, and singing experiences affect singing perceptions in the college age students? The selection of these predictors was based on the research regarding singing perceptions (Abril, 2007; Chandler, Chiarella, & Auria, 1988; Chinn, 1998; Cuddy et al., 2005; Darrow, Johnson, Miller, & Williamson, 2002; Fuchs, Meuret, Thiel, Taschner, Dietz, & Gelbrich, 2007; Hurley, 1995; Lamont, 1998/2002; MacDonald et al., 2002; Mills, 2010; Ruismaki & Tereska, 2008; Siebenaler, 2008; Sloboda et al., 1996; Sloboda, Wise, & Peretz, 2005; Sweet, 2010; Turton & Durrant, 2002; Whidden, 2009; Zdzinski & Skok, 2000). Composite
variables were created for the independent variables of home environment, music learning environment, social comparisons, and singing experiences by summing all of the SPP items pertaining to each of those variables (See Table 2).

For the dependent variable *Singing Perceptions*, SPP survey items 1-12 were summed to create a composite. Measures of central tendency for the *Singing Perceptions* composite variable were calculated as $M = 37.47, SD = 9.38$ with the minimum score being 14 and the maximum score of 56. A multiple regression was used with singing perceptions as the dependent variable and with the composite of home environment, music learning environment, social comparisons, and singing experiences as well as ethnicity, age, and gender as the independent variables.

**Research question three.** Research question three concerned participants involvement in singing. The questions stated what are the current typical singing experiences of individuals in the general population and how did participation differ based on singing perceptions and singing identity? For information regarding typical singing behaviors, the singing experience composite was used and frequency data was reported to determine the most common level of singing experience/participation across the sample. An ANOVA test of variance was performed to determine if singing perceptions differed based on singing experiences. Finally, a discriminate analysis was used to determine how singing experience items varied between by singing identity.
Chapter 4

Results

This chapter reports the results obtained from analysis of the data collected in this study. The chapter begins by discussing descriptive analysis and content analyzed data pertaining to singing identity, singing self-efficacy, and singing attitude, and factor constructs for singing perceptions in order to address the four sections of research question one. Next inferential results for singing perception predictors are presented to answer research question two. Finally, descriptive analysis and inferential results of group differences are reported to address all parts of the third research question.

Research Question One

What are the factors that make up the current singing perceptions of college students at a major university?

Descriptive analysis. The first three sections of research question one (i.e., Research Question 1-a, 1-b, and 1-c) examined the composites of singing identity, self-efficacy, and singing attitude in participant responses. Additionally, open responses for items related to singing identity were analyzed for content and reported. To address the research questions a descriptive analysis of singing identity, self-efficacy, and singing attitude was performed the Statistical Package for the Social Sciences (SPSS) version 18.0.

Research question one part a. Research question 1-a asked what is their singing identity? The singing identity variable analysis indicated that the majority of participants (N=171) identified themselves as non-singers (n=151) rather than singers (n=20).

In addition to identifying themselves as singers or non-singers, participants were asked in open response questions to list the main reason for their singing identity choice.
The results were analyzed for content based on singing identity and several categories emerged. This analysis method was based on procedures used by Zdzinski and Skok (2000). The categories most commonly reported by non-singers and singers are listed below.

Table 3

*Reasons Given for Singing Identity Choice*

<table>
<thead>
<tr>
<th>Category</th>
<th>Non-Singers (n = 151)</th>
<th>Singers (n = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition of Singer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singer is professional performer</td>
<td>21</td>
<td>Singer is professional performer</td>
</tr>
<tr>
<td>I only sing for fun</td>
<td>18</td>
<td>Singing key to my identity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficacy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not good enough singer</td>
<td>53</td>
<td>Good at singing</td>
</tr>
<tr>
<td>I cannot sing</td>
<td>24</td>
<td>Others say I have talent</td>
</tr>
<tr>
<td>Lack talent</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Lack confidence</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singing Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Still sing but not a “singer”</td>
<td>35</td>
<td>Mentioned singing experience</td>
</tr>
<tr>
<td>Only sing when alone never sing</td>
<td>16</td>
<td>Participated in singing at school</td>
</tr>
<tr>
<td>in front of others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of experience</td>
<td>14</td>
<td>Participated in choir</td>
</tr>
<tr>
<td>Stopped singing at some point</td>
<td>7</td>
<td>Sing often</td>
</tr>
<tr>
<td>Participated in singing at school</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Prefer other musical experience</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of training</td>
<td>16</td>
<td>Have specialized music knowledge</td>
</tr>
<tr>
<td>Like to get training</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Table 3 continued

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not like singing</td>
<td>4</td>
</tr>
<tr>
<td>No interest in singing</td>
<td>3</td>
</tr>
<tr>
<td>Singing not priority</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t like labels</td>
<td>1</td>
</tr>
<tr>
<td>Coincides with song writing interest</td>
<td>2</td>
</tr>
<tr>
<td>Important to expression of religious beliefs</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: The frequencies reported indicate each time a category was mentioned in participant responses. This means that in some instances participant answers were counted more than one time because their response encompassed multiple categories.

In examining similarities and differences in the open responses, the comments in the Definition of singer category were alike for both groups. A few singers and some non-singers defined the term singer in explaining their singing identity choice. They reported that a singer is someone who sings professionally or for specific performances ($n = 42$). Another similarity between the groups, many participant responses mentioned previous or current singing experiences ($n = 108$) as well as their beliefs about singing ability or efficacy ($n = 93$).

Not all categories had similar responses. The attitude category differed based on singing identity. Comments expressing a positive attitude about singing such as “I enjoy singing” or “I love to sing” were fairly common in singer responses. Conversely, few non-singers made negative comments about singing such as “I don’t like to sing.” Instead, the majority of non-singer responses focused on efficacy and singing experiences. When drawing conclusions from open response singer data, caution should be used due to the small representation of singers in this sample.
One last item that addressed possible differences between participants identifying themselves as singers and non-singers, was the age in which participants determined their singing identity. The results are presented in Figure 4 for singers and Figure 5 for non-singers.

![Figure 4](image)

**Figure 4.** Age singers and non-singers determined singing identity.

The results for the age participants identified themselves as singers, were positively skewed with most singers deciding by the age of five about their singing identity. In contrast, non-singers made their decision about singing identity in early adolescent or they never remembered making a conscious decision. Few singers appeared to decide later in life that they were singers. Thus in examining singing identity, participants seem to differ according to their singing identity, their responses
about why they selected a certain identity, and the age at which they identified
themselves as a singer or non-singer.

**Research question part one b and c.** Research question 1-b asked what is their
current level of singing self-efficacy? Research question 1-c asked what is their attitude
toward singing? A descriptive analysis was performed to answer these two research
questions.

**Descriptive analysis.** The descriptive results of total participant scores \((n = 171)\)
for the singing self-efficacy composite were \(M = 22.92, SD = 7.03\). The results of total
participant scores \((n = 169)\) for singing attitude were \(M = 19.56, SD = 4.01\). Participant
scores were also sorted by singing identity and are presented in Table 4.

Table 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non-Singer</th>
<th>Singer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy</td>
<td>21.83</td>
<td>31.0</td>
<td>22.92</td>
</tr>
<tr>
<td>Attitude</td>
<td>17.92</td>
<td>23.3</td>
<td>19.56</td>
</tr>
</tbody>
</table>

The total composite scores for singing self-efficacy had a fairly wide spread. The
mean comparison of self-efficacy differed by 10 points with the non-singer self-efficacy
mean being closer to the overall mean most likely because it was by far the larger group.
The data spread for total attitude scores was narrower than the self-efficacy scores. The
difference of the means based on singing attitude was not as great as for self-efficacy.
The attitudes of participants identifying themselves as singers were especially cohesive
with a small standard deviation.

To facilitate the application of this data, total participant self-efficacy scores were
categorized. Based on the overall composite score range (25), minimum score (8) and
maximum score (37), participants were categorized into four groups: *Low Confidence* (Score 8-16), *Moderate Confidence* (Score 16.1-23.9), *Medium Confidence* (Score 24-32), and *High Confidence* (Score 32.1-37). The results of this categorical analysis are reported Table 5.

Table 5

<table>
<thead>
<tr>
<th>Groups</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Confidence (Score 8-16)</td>
<td>36</td>
<td>20.9</td>
</tr>
<tr>
<td>Moderate Confidence (Score 16.1-23.9)</td>
<td>52</td>
<td>30.2</td>
</tr>
<tr>
<td>Medium Confidence (Score 24-32)</td>
<td>65</td>
<td>37.8</td>
</tr>
<tr>
<td>High Confidence (Score 32.1-37)</td>
<td>16</td>
<td>9.3</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Total (*n* =171)

Figure 5 serves as a graphic representation of the self-efficacy score groups.

![Singing Self-Efficacy by category groups](image)

*Figure 5. Singing self-efficacy by category groups*
The data reveals that a majority of participant scores falling into the lower levels of confidence in their singing ability or singing self-efficacy.

Total participant attitude scores were also categorized using the, minimum score (5) and maximum score (25). Scores were again categorized into four groups: *Negative*, *Somewhat Positive*, *Positive*, and *Very Positive* and are reported Table 6.

**Table 6**  
*Frequencies for Singing Attitude Groups*

<table>
<thead>
<tr>
<th>Groups</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative (Score 5-10)</td>
<td>5</td>
<td>2.9</td>
</tr>
<tr>
<td>Somewhat Positive (Score 11-15)</td>
<td>32</td>
<td>18.6</td>
</tr>
<tr>
<td>Positive (Score 16-20)</td>
<td>74</td>
<td>43.0</td>
</tr>
<tr>
<td>Very Positive (Score 21-25)</td>
<td>58</td>
<td>33.7</td>
</tr>
<tr>
<td>Missing</td>
<td>3</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Total (n=169)

*Figure 6.* Singing attitude scores by category group.
Unlike self-efficacy, the singing attitude data showed that a majority of participant scores indicating a positive attitude about singing. The data for singing self-efficacy and singing attitude reveal the majority of participants are not confident about their singing ability, but they have a mostly positive attitude about singing.

**Research question one part d.** Research question 1-d asked how did singing self-concept, singing self-efficacy, and attitude toward singing comprise singing perceptions? This question was answered using an exploratory factor analysis.

**Exploratory factor analysis.** The last section of research question one (i.e., Research Question 1-d) examined the factors comprising singing perceptions. An exploratory factor analysis with direct oblimin rotation was performed using SPSS version 18.0. A sample of $N = 171$ cases was used to analyze the first 12 survey items of the $SPP$ survey. Factors were selected based on meeting the three criteria outlined by Asmus (1989) and Jeong (2011), including selecting factors with an eigenvalue greater than 1.0, selecting factors above the critical point identified by the scree plot, and finally through the distribution of factor loadings.

To ensure adequate sampling for data analysis, the Kaiser-Meyer-Oklin Measure of Sampling Adequacy (MSA) was performed and resulted in a score of .897. The Bartlett’s Test of Sphericity was also performed and was found to be significant (see Table 7). The scores from these analyses indicate that the item matrix was suitable for factoring.
Table 7

<table>
<thead>
<tr>
<th>Measure of Sampling Adequacy for Item Pool</th>
<th>Chi-square</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Oklin Measure of Sampling Adequacy</td>
<td>1226.529</td>
<td>66</td>
<td>.001</td>
</tr>
<tr>
<td>Bartlett’s Test of Sphericity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The factor analysis produced 2 factor solutions with eigenvalues greater than one, which accounted for 63% of the variance in the total scores of the SPP (see Table 8).

Table 8

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigenvalue</th>
<th>(% of Variance)</th>
<th>Cumulative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.9</td>
<td>49.8</td>
<td>49.8</td>
</tr>
<tr>
<td>2</td>
<td>1.6</td>
<td>13.3</td>
<td>63.14</td>
</tr>
</tbody>
</table>

Additionally, a scree plot was calculated to demonstrate where each item fell within the overall scale and in reference to the critical point (see Figure 8).

*Figure 7.* Exploratory factor analysis scree plot.
Finally, the factor matrix displays the distribution of factors across all items.

Table 9  
*Exploratory Factor Analysis Pattern Matrix*

<table>
<thead>
<tr>
<th>Item</th>
<th>Component 1</th>
<th>Component 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am not very good at singing.</td>
<td>.929</td>
<td>-.053</td>
</tr>
<tr>
<td>I am a better singer than most people I know.</td>
<td>.922</td>
<td>-.053</td>
</tr>
<tr>
<td>I am a worse singer than most people I know.</td>
<td>.908</td>
<td>-.072</td>
</tr>
<tr>
<td>I am confident I could sing the majority of pitches correctly in a familiar melody.</td>
<td>.830</td>
<td>-.015</td>
</tr>
<tr>
<td>I am tone deaf.</td>
<td>.776</td>
<td>-.057</td>
</tr>
<tr>
<td>I am confident I could sing well in front of an audience if I was singing with a large group.</td>
<td>.594</td>
<td>.104</td>
</tr>
<tr>
<td>I am confident singing by myself in front of others.</td>
<td>.438</td>
<td>.165</td>
</tr>
<tr>
<td>I am an average singer compared to most people I know.</td>
<td>.428</td>
<td>.108</td>
</tr>
<tr>
<td>I dislike singing.</td>
<td>-.067</td>
<td>.910</td>
</tr>
<tr>
<td>I believe singing is beneficial to me.</td>
<td>-.022</td>
<td>.855</td>
</tr>
<tr>
<td>I enjoy singing.</td>
<td>.048</td>
<td>.852</td>
</tr>
<tr>
<td>Singing is important in my life.</td>
<td>.146</td>
<td>.777</td>
</tr>
</tbody>
</table>


Table 10  
*Exploratory Factor Analysis Structure Matrix*  

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am not very good at singing.</td>
<td>.900</td>
<td>.450</td>
</tr>
<tr>
<td>I am a better singer than most people I know.</td>
<td>.893</td>
<td>.447</td>
</tr>
<tr>
<td>I am a worse singer than most people I know.</td>
<td>.869</td>
<td>.420</td>
</tr>
<tr>
<td>I am confident I could sing the majority of pitches correctly in a familiar melody.</td>
<td>.822</td>
<td>.435</td>
</tr>
<tr>
<td>I am tone deaf.</td>
<td>.746</td>
<td>.364</td>
</tr>
<tr>
<td>I am confident I could sing well in front of an audience if I was singing with a large group.</td>
<td>.651</td>
<td>.426</td>
</tr>
<tr>
<td>I am confident singing by myself in front of others.</td>
<td>.527</td>
<td>.402</td>
</tr>
<tr>
<td>I am an average singer compared to most people I know.</td>
<td>.487</td>
<td>.340</td>
</tr>
<tr>
<td>I enjoy singing.</td>
<td>.510</td>
<td>.878</td>
</tr>
</tbody>
</table>
I dislike singing. \[.426 \quad .579\]
Singing is important in my life. \[.567 \quad .856\]
I believe singing is beneficial to me. \[.441 \quad .843\]

Note: Extraction Method - Principal Factor Analysis. 2 factors extracted. Factor 1 items are singing self-efficacy. Factor 2 items are singing attitude.

From the data, it is apparent that items fell into two factors (see Table 9). The identified factors included both singing self-efficacy and singing attitude. Many of the items cross-loaded or had .300 or higher scores for both singing self-efficacy and singing attitude. This indicates a correlation between these two factors. To further illustrate the division of the two factors, the component plot is provided in Figure 9 to serve as a visual representation of the item groupings.

*Figure 8, Factor/component plot in rotated space*
As Figure 9 illustrates, the overall item load was in the same general area, but distinct groups are clearly indicated. This serves as evidence that the factors fall under one term because most of the items are located in the top right quadrant of the component matrix. Singing perceptions that had two parts (self-efficacy and singing attitude) within the overall construct structure. Singing identity was not identified as an independent factor of singing perceptions. Possible reasons for this result will be discussed in the discussion section of this chapter.

**Research Question Two**

Research question two asks how do home environment, music learning environment, social comparisons, ethnicity, age, gender, and singing experiences affect singing perceptions in college students?

**Singing perception predictors.** To answer this question, a simultaneous multiple regression was completed using SPSS version 18.0 with Singing Perceptions as the dependent variable. The results are reported in Table 10.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b</td>
<td>Std. Error</td>
<td>β</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>12.968</td>
<td>3.830</td>
<td>.385</td>
<td>.001</td>
</tr>
<tr>
<td>Age</td>
<td>-1.279</td>
<td>1.281</td>
<td>-.070</td>
<td>.320</td>
</tr>
<tr>
<td>Gender</td>
<td>.903</td>
<td>1.266</td>
<td>.050</td>
<td>.477</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>1.096</td>
<td>.745</td>
<td>.010</td>
<td>.143</td>
</tr>
<tr>
<td>Home Environment</td>
<td>.544</td>
<td>.173</td>
<td>.250</td>
<td>.002</td>
</tr>
<tr>
<td>Music Learning Environment</td>
<td>.235</td>
<td>.362</td>
<td>.051</td>
<td>.517</td>
</tr>
<tr>
<td>Social Comparisons</td>
<td>.220</td>
<td>.278</td>
<td>.060</td>
<td>.430</td>
</tr>
<tr>
<td>Singing Experiences</td>
<td>.902</td>
<td>.170</td>
<td>.400</td>
<td>.001</td>
</tr>
</tbody>
</table>

Note: Dependent Variable: Singing Perceptions ($R^2 = .411$).
The omnibus test was statistically significant, $R^2 = .411$, $F(7, 156) = 14.83$, $p < .001$. The overall prediction model accounted for 41% of the variance in singing perceptions. The data reveals two significant predictors home environment ($p = .002$) and singing experiences ($p < .001$). This means for each SD unit increase in a participant’s home environment score, their expected singing perceptions score would increase by 0.25 a SD unit (i.e., $\beta = 0.26$). Likewise, for each SD unit increase a participant’s singing experience score, their expected singing perceptions score will increase by 0.40 a SD unit (i.e., $\beta = 0.26$). No other independent variables were found to be significant predictors of singing perceptions.

**Research Question Three**

Research question three: what are the current typical singing experiences of individuals in the general population and does participation differ based on singing perceptions? A descriptive analysis and an ANOVA test of variance were used to answer this question.

**Descriptive analysis.** Descriptive statistics determining the most common level of music participation across the sample were computed using the Statistical Package for the Social Sciences (SPSS) version 18.0 program (Table 11). The data regarding singing experience includes mean ($M=10.96$), standard deviation ($SD=4.27$), for the composite *singing experiences* variable created by summing *SPP* items 25-30 with a total of $n =161$. Using the minimum (1) and maximum scores (21.8) of the singing experience composite, participants were categorized into five experience groups: *Almost None*, *Few*, *Minimal*, *Many*, and *Extensive*. The results of this categorical analysis are reported below.
Table 12
Singing Experience Group Frequencies

<table>
<thead>
<tr>
<th>Group Description</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost None (Score 0-3.9)</td>
<td>10</td>
<td>5.8</td>
</tr>
<tr>
<td>Few (Score 4-7.9)</td>
<td>30</td>
<td>17.4</td>
</tr>
<tr>
<td>Minimal (Score 8-11.9)</td>
<td>66</td>
<td>38.4</td>
</tr>
<tr>
<td>Many (Score 12-15.9)</td>
<td>45</td>
<td>26.2</td>
</tr>
<tr>
<td>Extensive (Score 16-22)</td>
<td>20</td>
<td>11.6</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Total (n=172)

Figure 10 serves as a graphic representation of the singing experience groups. The singing experience data reveals that the majority of participants reported at least a moderate number of singing experiences.
To investigate possible differences in singing experiences based on singing perceptions an Analysis of Variance was conducted with the categorical singing experience group scores. The results are presented in Table 13.
Table 13

Analysis of Variance: Tests of Between-Subjects Effects
Dependent Variable: Singing Perceptions

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sing_ExpCat5</td>
<td>4387.320</td>
<td>4</td>
<td>1096.830</td>
<td>17.211</td>
<td>.001</td>
</tr>
<tr>
<td>Error</td>
<td>10578.867</td>
<td>166</td>
<td>63.728</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Total</td>
<td>14966.187</td>
<td>170</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: $R^2 = .293$

The results indicate that there were significant mean differences between singing perceptions based on singing experiences ($F(4, 166) = 17.21, p < .001$), and the variable singing experiences accounted for 29.3% ($R^2 = .293$) of the variance in singing perceptions. The Bonferroni Adjusted Post Hoc analysis was used to determine which specific singing experience groups had mean differences (See Table 13).

Table 14

Bonferroni Post Hoc Test on Singing Perceptions by Singing Experience Groups

<table>
<thead>
<tr>
<th>(I) Sing_ExpCat5</th>
<th>(J) Sing_ExpCat5</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost None 3.99</td>
<td>0-7.99</td>
<td>-1.4000</td>
<td>2.91498</td>
<td>1.000</td>
</tr>
<tr>
<td>Moderate 8-11.99</td>
<td>-8.4333*</td>
<td>2.70895</td>
<td>.022</td>
<td></td>
</tr>
<tr>
<td>Many 12-15.99</td>
<td>-13.0333*</td>
<td>2.79088</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Extensive 16-22</td>
<td>-16.4000*</td>
<td>3.09180</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Few 4-7.99</td>
<td>Almost None 0-3.99</td>
<td>1.4000</td>
<td>2.91498</td>
<td>1.000</td>
</tr>
<tr>
<td>Moderate 8-11.99</td>
<td>-7.0333*</td>
<td>1.75780</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Many 12-15.99</td>
<td>-11.6333*</td>
<td>1.88161</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Extensive 16-22</td>
<td>-15.0000*</td>
<td>2.30449</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>
Table 14 (continued)

<table>
<thead>
<tr>
<th>Singing Experience</th>
<th>Perception</th>
<th>Mean</th>
<th>t value</th>
<th>df</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate 8-11.99</td>
<td>Almost None 0-3.99</td>
<td>8.4333*</td>
<td>2.70895</td>
<td>.022</td>
<td></td>
</tr>
<tr>
<td>Few 4-7.99</td>
<td>7.0333*</td>
<td>1.75780</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Many 12-15.99</td>
<td>-4.6000*</td>
<td>1.54329</td>
<td>.033</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensive 16-22</td>
<td>-7.9667*</td>
<td>2.03764</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Many 12-15.99</td>
<td>13.0333*</td>
<td>2.79088</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Few 4-7.99</td>
<td>11.6333*</td>
<td>1.88161</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate 8-11.99</td>
<td>4.6000*</td>
<td>1.54329</td>
<td>.033</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensive 16-22</td>
<td>-3.3667</td>
<td>2.14536</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensive 16-22</td>
<td>16.4000*</td>
<td>3.09180</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Few 4-7.99</td>
<td>15.0000*</td>
<td>2.30449</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate 8-11.99</td>
<td>7.9667*</td>
<td>2.03764</td>
<td>.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Many 12-15.99</td>
<td>3.3667</td>
<td>2.14536</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on observed means. The error term is Mean Square (Error) = 63.728.

The post hoc revealed that the participants in the outlying groups of *Almost None*, *Few*, and *Extensive* differed in their *Singing Perceptions* from participants in the *Moderate* and *Many* singing experience groups.

**Discussion**

**Singing identity.** The research data collected with the *SPP* survey revealed that the majority of participants in the sample identified themselves as non-singers. Additionally, a large number of participants also identified themselves as tone deaf (*n* =104 or 61%) in item 11 of the *SPP*. The percentage of self-identified non-singers is slightly higher than reports of poor singing (59%) found by Pfordresher and Brown (2007). Participant reports of self-identified tone deafness in this study are also higher than percentages of tone deafness reported by Cuddy, Balkwill, Peretz, and Holden (2005) who found 17% and Peterson (2001) who found 12.8%.

In the open responses, a few participants stated they believed the term singer refers to someone who sings for specific performances or is a professional singer.
According to some participants of this study, singing for fun does not make someone a singer. Therefore, according to participants the definition of the term singer is specialized. A singer is someone who sings very well, does not mind performing in front of others, and the term singer often implies the individual sings professionally.

The age most individuals decided their singing identity was lower (age 1-5) for singers than for non-singers (age 11-15). Both of these results differed from the age of identity formation (age 7-8) found by Eccles (1993) and Wigfield et al. (1999). The participants of this study, however, were all between the ages of 18 to 26 while Eccles’ study was conducted with children. This may account for the difference in the results of this study and the results found by Eccles. The data trend in the singer group indicated the number of participants identifying themselves decreased as age increased. This trend coincides with research by Eccles and Wigfield et al.

**Singing self-efficacy.** In the case of singing self-efficacy, data analysis revealed self-efficacy scores were more normally distributed than reports of tone deafness \( (n = 104) \). Many participants had a medium low \( (n = 52) \) or medium high \( (n = 65) \) confidence score with only 36 participants having a low confidence score. Open response answers categorized as self-efficacy, appear to agree more with the quantitative self-efficacy scores than participant claims of tone deafness. For example, a total of 80 participants claimed in the open response that they could not sing or were not good enough to consider themselves singers. These response frequencies help confirm the large number of self-efficacy scores that fell into the low and medium low confidence groups \( (n = 88) \). It is difficult to determine why the reports of tone deafness were so
high, but it is possible that the term may have additional cultural connotations not investigated through the SPP survey.

**Singing attitudes.** Most participants reported a positive or very positive attitude toward singing even though the majority identified themselves as non-singers. Many participants reported singing on a weekly \( (n = 51) \) or daily \( (n = 99) \) basis. This serves as further evidence that individuals who identify themselves as non-singers are still sing. Nonetheless, open responses suggest that this singing may occur in an informal setting. Many singers and non-singers reported they liked to sing-a-long as they listen to music either in their car or in another location. This data is consistent with results of studies by Richards (1999) and Wheaton (1998) that context is important to individuals who would not normally consider themselves as singers.

Open responses attitude categories also varied in frequency based on singing identity group membership. For instance, singers mentioned loving or enjoying more often than non-singers. Relatively few non-singers mentioned their singing attitude in open responses. The non-singers who did mention attitude often indicated a lack of interest or that singing was not a priority \( (n = 6) \). Only four participants reported that they did not like to sing. Interestingly, in most cases this was paired with a comment indicating a low level of singing self-efficacy. These results support findings from prior research by S. O’Neil (2002), Hays (2005), and Hedden (2007).

The varied interest and priority placed on singing by participants in the open responses also coincides with S. O’Neil’s research indicating that singing interest or priority differs based on the individual. Examining the overall singing attitude picture presented by the results, most individuals appear to have a positive attitude toward
singing as an activity. Even though they may not have confidence in their singing ability, participants still report singing informally on a fairly regular basis.

**Singing perceptions.** This study proposed that singing perceptions were composed of three factors: singing identity, singing self-efficacy, and singing attitudes. The exploratory factor analysis found two factors in singing perceptions: singing self-efficacy and singing attitude. The two factors of singing perceptions identified by the factor analysis is consistent with the research of Monk (2003), who also identified multiple factors in musical identity. Additionally, while the two factor singing perception is not the proposed conceptual model, it is in line with the vocal production factor identified by Cuddy et al. (2005). Singing perceptions like the Cuddy et al. vocal production factor were comprised of singing self-efficacy and singing attitudes. This study’s results indicate that singing perceptions are comprised of two factors, which is consistent with the research of Cuddy et al. and Monks.

One reason that singing identity was not found to be a factor, is that items 1-12 used in the factor analysis did not adequately represent singing identity. It is important to note that all of the data presented regarding singing identity for research questions 1a-c was conducted based on the *SPP* item 31, which provided dichotomous categorical data. Specifically, participants were asked to identify themselves as either a singer or non-singer. This item was not included in the factor analysis because of its categorical data type. Therefore, it is possible that singing identity was not well represented in the items used for the factor analysis.
**Predictors.** Concerning the predictors of singing perceptions, two predictors were found to be significant, home environment and singing experience. These variables accounted for 40% of the variance in singing perceptions. The identification of home environment as a significant predictor of singing perceptions is similar to outcomes of previous research studies (MacDonald; 2002; Sichivista, 2007; Siebenaler, 2008; Turton & Durrant, 2002; Zdzinski & Skok, 2000). Singing experiences as a predictor of singing perceptions is consistent with the results of a number of studies (Campbell, 2010; Neill, 1998; Wise & Sloboda, 2008; Zdzinski & Skok, 2000). The ability of singing experience to predict singing perceptions and specifically singing attitudes agrees with research by Hedden who found that students participating in singing had better attitudes about singing than non-participants (Hedden, 2007). As mentioned earlier in the chapter, as singing experiences increase, singing perception scores will also increase. The application of this result to singing self-efficacy coincides with research and theories by Sloboda et a. (2005) and Fuchs (2007) who found that singing participation may affect self-efficacy.

Conversely, music learning environment, social comparisons, age, gender, and ethnicity were not found to be significant factors of singing perceptions. The non-significance of social comparisons as a predictor for singing perceptions was unexpected. Much of the research literature indicates that social comparisons are important in the formation of singing perceptions. The results of this study may be due to a difference between the sample age ($M = 20.4, SD =2.1$) of this study, and that of previous research, which was conducted with children of elementary and middle school age (Mizener, 1993; Siebenaler, 2008). The non-significance of social comparisons found in this study is
consistent with previous research by Neill (1998), whose study has the only sample with a similar mean age.

The results concerning music learning environment indicated that music learning was not a significant predictor of singing perceptions. Singing experiences in school and choir, however, were mentioned in open responses especially from participants identifying as singers \((n = 14)\), but also by non-singers \((n = 4)\). Many previous research studies found that music learning environments did contribute to singing efficacy and attitudes (Abril, 2007; Lamont, 1998/2002; MacDonald et al. 2002; Richards, 1999; Ritchie & Williamon, 2010; Ruismaki & Tereska, 2008; Sichivista; 2001; Siebenaler, 2008; Temmerman, 1993; Turton & Durrant; 2002; Whidden, 2009; Zdzinski & Shok, 2000).

A frequency analysis was conducted on items pertaining to the music learning environment composite to illuminate why the results of this study were inconsistent with other studies. On item 20, participants were asked to identify who encouraged them to sing, and 30% of participants \((N = 171)\) indicated that no one encouraged them to sing. For item 21, when asked to respond to the statement “My teachers at school encouraged me to sing,” 67% selected they disagreed or were unsure of receiving encouragement from teachers. Therefore, the frequencies indicated that many of the participants were not encouraged to sing by teachers in schools or other music learning environments. This may be one reason why music learning environment was not significant. An additional reason for non-significance may be attributed to the limitations of the measure.

While previous research indicates age and ethnicity were related to attitudes about and participation in singing activities, the participants of this study were largely from one
Therefore, the lack of variability in the sample regarding age and ethnicity may have prevented these variables from being significant. Additionally, much of the previous research that found gender to be a significant predictor of singing was conducted with children or adolescents (Mizener, 1993; Eccles, 1993). The difference in sample age group may have contributed to the non-significance of this predictor.

**Singing experiences.** In investigating the current state of singing experiences for participants in this study, data analysis revealed scores were fairly normally distributed with most participants having few to many singing experiences ($n = 141$). The largest number of participants had moderate singing experiences ($n = 66$). The ANOVA test of variance revealed that singing perceptions differed based on singing experiences. The post hoc revealed three significantly different levels of experience scores in relation to singing perceptions: almost none/few, moderate, and many/extensive.

Since singing perceptions are comprised of singing self-efficacy and singing attitudes, the data regarding singing experiences is consistent with research that indicates self-efficacy and attitude are related to singing experiences (Asmus 1986/90; Cuddy et al., 2005; S. O’Neil, 2002; Wigfield et al., 1997). Therefore data indicates that an individual’s singing participation may have an effect on their singing perceptions.
Chapter 5
Summary and Conclusions

Summary

The purpose of this study was to investigate predictors of self-labeled singers and non-singers’ beliefs about singing, with the additional goal of exploring a conceptualization of singing perceptions. Specifically, the three conceptualized singing components were examined to determine their frequency in the sample and their relationship to the composition of singing perceptions. Additionally, variables were analyzed to examine predictors of singing perceptions. Finally, singing experiences in the sample were examined both for frequency and for possible differences based on participants’ singing perceptions.

The Singing Perceptions and Participation (SPP) survey was created based on singing research literature (Bong & Skaavlik, 2003; Mizener, 1993; Siebenaler, 2008; and Vispoel, 1996). The SPP survey examined participants singing perceptions, inquired about their singing experiences as well as collecting demographic data. The survey was examined by experts in the field of psychology and music education as well as by two self-identified non-singers who were the same age as the sample. Items were adjusted based on recommendations and results from a pilot study (N = 19). Reliability for the measure was calculated again at the conclusion of data collection using Cronbach’s alpha. The reliability for the Singing Perception items was 0.91.

Intact college psychology and music appreciation classes at the University of Miami were selected to participate in the study. The survey was administered through the
Survey Monkey website. Students were emailed a link to the online survey and had 10 days to complete the survey. Originally, the survey was to be distributed to some participants via hard paper copies. However, it was determined that distributing the survey to all participants in the same manner would be possible and more efficient for the analysis of data. Approximately 427 students were emailed the survey and 173 completed the measure resulting in a 40.5% response rate. The collected data was analyzed using descriptive statistics, a multiple regression, and an ANOVA. The results of analysis were presented in chapter four.

Conclusions

Based on the data gathered in this study the following conclusions can be drawn.

1. The vast majority of participants considered themselves non-singers and only a few identified themselves as singers.

2. The exploratory factor analysis revealed only two components in singing perceptions: singing self-efficacy and singing attitude.

3. Participants in both the singer and non-singer identity groups indicated that the term singer meant someone who performed or was a professional. Many participants indicated they were not singers because they only sang for fun in an informal setting. Thus there seems to be a difference between participating in singing and identifying one’s self as a singer.
4. **Many of the non-singer participants did not have a large amount of confidence in their ability to sing.** Singers mentioned in their responses that they had an ability to sing, while participants who identified themselves as non-singers often reported that they did not have a great deal of confidence in their ability to sing. Many participants could sing they felt they did not sing well enough to be considered a singer.

5. **Attitudes appear to be more important to singers than non-singers as a reason for the formation of singing identity.** Singer responses indicated that singing attitude was one of the main reasons that they identified themselves as singers, while non-singers rarely listed their attitude about singing as a reason for identifying themselves as a non-singer.

6. **Singers tend to determine their identity in the early years of their life, while non-singers identified themselves as non-singers in adolescence. Home environment and singing experiences were significant predictors of singing perceptions.** The lack of experience or the decision to stop participation in formal singing experiences were both used as justifications for identifying as a non-singer. Many participants reported never being encouraged to sing. The early age that singers reported forming their singing identity suggests that parents are influential in the formation of singing identity and that early singing experiences may be important to singing later in life.
Open response data revealed that while singer and non-singer answers were often different, the overall identified response categories (efficacy, singing experience, instruction, attitude, and other) were the same. The categories with the highest frequency of responses were those pertaining to self-efficacy and singing experience.

**Implications**

The results of this study indicate that although few people consider themselves singers, most people are singing on a fairly regular basis in an informal setting. Therefore if participants were given the opportunity to sing in a context that they felt comfortable they would be more likely to sing. Additionally, singers are seen as individuals with a specialized role in the culture. Education about the acceptability of informal singing as a part of life might help individuals feel freer to identify themselves as singers. Teachers need to encourage their students to continue singing experiences beyond school. Data also indicates that singing perceptions encompass two main areas: singing self-efficacy and singing attitude. Overall participant attitudes appear to be fairly high. However, lower levels of self-efficacy seem to have prevented some individuals from identifying as singers. Thus, it appears to be important to take every opportunity to encourage individuals’ beliefs in their singing ability.

The main reason given by participants regarding why they do not sing in a more formal setting is because they feel they cannot sing well. Home environment and singing experiences are crucial factors in determining singing perceptions. Additionally, taking into account the age participants reported establishing their singing identity, the ideal
conditions for the formation of singing perceptions is to have many positive singing experiences and a positive home environment especially in the early childhood.

The data collected in open responses indicated that singing experiences were one of the main reasons people identified themselves as a singer. Non-singers also mentioned singing experiences fairly frequently. Many of these responses mentioned a lack of opportunity to sing or that they stopped singing in middle or high school. It is interesting that so many participants mentioned singing experiences when citing reasons for their singing identity. The high frequency of singing experience responses helps to verify the significance found in the quantitative singing data. The importance of singing experience is significant to music educators because singing experiences is a variable, which can be modified.

**Recommendations**

For future research, it is recommended to expand the sample to include a variety of singing identities, multiple ages, and representation from a broader range of ethnicities to better understand the formation of singing perceptions across various age groups. This would also help to present a clearer picture of singing perceptions and explore any fluctuations over time. The expansion of the sample might also help to confirm the role of social comparisons, music learning environment, age, and ethnicity in singing perceptions. Previous research indicates that these factors may be important to the formation of singing identity. A sample spanning several age groups might be able to help illuminate the significance of these variables.

In the case of the composition of singing perceptions, it would be beneficial to expand the Likert items pertaining to singing identity to confirm the two-factor
composition of singing perceptions. Further research might be able to determine if singing identity is an independent factor of singing perceptions or if it is subsumed by the two identified factors. If singing identity is not an independent factor, as indicated by the results of this study, then further analysis regarding which of the two identified factors (singing efficacy or singing attitude) it does fall under might help to better understand participant relationships to singing.

In further research regarding singing perceptions, singing attitude was found to be a part of perceptions. Previous research indicated the weight given to attitude might differ according to singing identity. Further research exploring the role of singing attitudes based on singing participation or identity might help further clarify this finding. Additionally, some open responses indicated that the importance of singing varied across participants with at least one participant stating that singing was their identity. Based on this data, an investigation into how singing as an activity effects or does not effect individuals’ overall personal identity development would help to clarify this findings of this study.

Based on the results found in this study as individuals increase in age the likelihood of their identifying themselves as a singer appears to decrease. Further research regarding this topic is needed to verify this interpretation of the data. Finally, the contrast between the medium to low self-efficacy scores and the high number of individuals who reported they were tone deaf indicates that a more in depth study of the term tone deaf might be warranted.

This study focused on developing a better understanding of singing perceptions. As indicated in the open response items, the term singer appears to have a specialized
role in the current culture. While many individuals did not consider themselves singers, most participants enjoyed singing. Open responses indicated that interest and the priority of singing varied across participants from little interest to statements that singing was a major factor in participant identity. The goal of this study was not to make everyone a singer, but rather to better understand the formation of singing perceptions so that all individuals will have the best opportunity to determine the importance of singing in their lives.
References


doi:10.1146/annurev.psych.51.1.1

doi:10.1196/annals.1360.026


doi:10.1111/1467-8624.ep9308115032


Haygood, J. L. (1993). A study of the continuum of choral singing from secondary choral programs to selected higher education choral programs in Indiana. (Doctor of Arts, Ball State University).


Appendix A

Internal Review Board Letters of Permission
Dear Student,

My name is Gaile Stephens. I am currently enrolled as a doctoral student in music education at the University of Miami’s Frost School of Music. I am involved in a research study investigating the Formation and Prediction of the Singing Perceptions of Self-Labeled Singers and Non-Singers. The study is examining experiences and ideas that influence what individuals believe about singing.

PURPOSE OF STUDY:
You are being asked to participate in this research study because we are trying to learn about the singing perceptions of college students. You will be asked to complete a brief survey about your experiences and beliefs about singing. The survey will take no more than 20 minutes to complete. There are no risks or direct benefits associated with participation in this study.

Your name and email address will only be recorded if you wish to participate in a raffle. Only the principal investigator and co-investigator will have access to the information collected during the survey. When the project is finished and results are reported, no individual will be identified in any way.

Your participation is voluntary. If you are a student, your desire not to participate, or your request to withdraw from the study will not affect your grades or other academic standings within the University. If you are an employee of the University, your decision to participate in or to withdraw from the study will not affect your employment within the University. Answering the following survey questions indicates your consent to participate in this research study. If you agree to participate, please fill out the survey on the following pages.

One $50 gift card to Amazon.com will be awarded to a participant as an incentive for completion of this survey. The participant will be randomly selected from those who completed surveys and will be notified via e-mail that they will receive one gift card for $50 to Amazon.com. Official rules are included and available for your perusal as a part of the survey. If you would like to be entered in the drawing for the $50 Amazon.com gift card, you may enter your contact information at the conclusion of the survey. Please note that this information is used for the purpose of selecting winners of the gift card incentive and will not be used to identify your survey responses in any way.

If you have any questions or concerns about this research, please feel free to contact me at e.stephens@umiami.edu. You may also contact Dr. Stephen Zdzinski, Principal Investigator and Faculty Sponsor by phone at 305-284-2161, ext. 7602, or by mail at P.O. Box 248165, Coral Gables, FL 33124-7610. If you have questions regarding your rights as a research participant, please contact the Human Subject Research Office at the University of Miami at 305-243-3195.

Sincerely,

Elizabeth Gaile Stephens
Teaching Assistant
Department of Music Education and Music Therapy
Frost School of Music, University of Miami
e.stephens1@umiami.edu
Appendix B

Singing Perceptions and Participation Survey (SPP)
### Singing Perceptions

1. I enjoy singing.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
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</tbody>
</table>

Choose One

2. I am a better singer than most people I know.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
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</table>

Choose One

3. I am an average singer compared to most people I know.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
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</table>

Choose One

4. Singing is important in my life.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Choose One

5. I am a worse singer than most people I know.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</table>

Choose One

6. I believe singing is beneficial to me.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</table>

Choose One
<table>
<thead>
<tr>
<th>Singing Perceptions (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. I am not very good at singing.</td>
</tr>
<tr>
<td>Strongly Agree</td>
</tr>
<tr>
<td>Choose One</td>
</tr>
</tbody>
</table>

| 8. I am confident singing by myself in front of others. |
| Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree |
| Choose One |

| Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree |
| Choose One |

| 10. I am confident I could sing the majority of pitches correctly in a familiar melody. |
| Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree |
| Choose One |

| 11. I am tone deaf. |
| Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree |
| Choose One |

| 12. I am confident I could sing well in front of an audience if I was singing with a large group. |
| Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree |
| Choose One |
### Singing Influences

<table>
<thead>
<tr>
<th>13. My parent(s)/guardian(s) liked to sing.</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>N/A</th>
</tr>
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<tbody>
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<td>Choose One</td>
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</table>

<table>
<thead>
<tr>
<th>14. My parent(s)/guardian(s) often sang to me when I was young.</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>N/A</th>
</tr>
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<td>Choose One</td>
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</table>

| 15. The age my parent/guardian stopped singing with me was..... | | | | | | |
| 1-3                                                             |                |       |                          |          |                  |     |
| 4-6                                                             |                |       |                          |          |                  |     |
| 7-11                                                            |                |       |                          |          |                  |     |
| 12 or older                                                     |                |       |                          |          |                  |     |
| Still sing with me                                             |                |       |                          |          |                  |     |
| Never sang to me                                               |                |       |                          |          |                  |     |
| Not Sure                                                        |                |       |                          |          |                  |     |

<table>
<thead>
<tr>
<th>16. My parent(s)/guardian(s) encouraged me to participate in singing activities.</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>N/A</th>
</tr>
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<td>Choose One</td>
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</table>

<table>
<thead>
<tr>
<th>17. I often sang with my family at home.</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>N/A</th>
</tr>
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<td>Choose One</td>
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</tbody>
</table>

| 18. Singing was important to my family.                                                   | Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree | N/A |
|                                                                                            |                |       |                          |          |                  |     |
| Choose One                                                                                 |                |       |                          |          |                  |     |

| 19. Singing is important in my culture.                                                    | Strongly Agree | Agree | Neither Agree or Disagree | Disagree | Strongly Disagree | N/A |
|                                                                                            |                |       |                          |          |                  |     |
| Choose One                                                                                 |                |       |                          |          |                  |     |
## Singing Influences (Continued)

### 20. The people who encouraged me to sing were... (check all that apply)

- [ ] Elementary Teacher
- [ ] Middle School Teacher
- [ ] High School Teacher
- [ ] Private Teacher
- [ ] Religious Teacher/Leader
- [ ] No One Ever Encouraged Me to Sing

Other (please specify)

### 21. My teachers at school encouraged me to sing.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
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</table>

Choose One

### 22. Growing up singing was important to my friends.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Choose One

### 23. Growing up my friends encouraged me to sing.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Choose One

### 24. The age at which my friends most influenced my decision to sing was:

- [ ] Preschool (0-5)
- [ ] Elementary (5-11)
- [ ] Middle School (12-18)
- [ ] High School (16-18)
- [ ] After High School (18 or Older)
- [ ] Friends Never Influenced Me to Sing
Singing Experiences

25. When I was in elementary school, I sang (select all that apply)
   - [ ] At Home
   - [ ] At School
   - [ ] At House of Worship
   - [ ] In Community/Social Organization
   - [ ] I Never Sang
   - Other (please specify)

26. In middle school, I sang (select all that apply)
   - [ ] At Home
   - [ ] At School
   - [ ] At House of Worship
   - [ ] In Community/Social Organization
   - [ ] I Never Sang
   - Other (please specify)

27. In High School, I sang (select all that apply)
   - [ ] At Home
   - [ ] At School
   - [ ] At House of Worship
   - [ ] In Community/Social Organization
   - [ ] I Never Sang
   - Other (please specify)
29. I am comfortable singing. (Please select all that apply).

- [ ] Solo in front of others
- [ ] With a group in front of others
- [ ] When I am by myself
- [ ] I am never comfortable singing

30. On average I sing? (Include singing when no one is around).

- [ ] Daily
- [ ] Weekly
- [ ] Monthly
- [ ] Annually
- [ ] I never sing. (Not even when I am alone)
31. I identify myself as a singer.

- Agree
- Disagree
32. Briefly describe the main reason you identify yourself as a singer.

33. Briefly describe any one experience that led you to identify yourself as a singer.

34. At what age did you decide you could sing.
- 1-5
- 6-10
- 11-15
- 16-18
- 18 or older
- Don't Remember
- Other (please specify)

35. Describe your most memorable singing experience.

36. Would you consider the experience described in the previous question as..
- Positive
- Negative
- Not Applicable
- Other (please specify)
### Singing Identity Continued

#### 37. I can sing, but I don't consider myself a singer.

<table>
<thead>
<tr>
<th>Level of Agreement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree or Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

#### 38. Briefly describe the main reason you DO NOT identify yourself as a singer.

- [ ]

#### 39. Briefly describe any one experience that lead you to identify yourself as a non-singer.

- [ ]

#### 40. At what age did you decide you could not sing.

- [ ] 1-5
- [ ] 6-10
- [ ] 11-15
- [ ] 16-18
- [ ] 18 or older
- [ ] Don’t remember
- [ ] Other (please specify)

#### 41. I stopped singing when my voice changed.

<table>
<thead>
<tr>
<th>Level of Agreement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>N/A</th>
</tr>
</thead>
</table>

#### 42. Describe your most memorable singing experience.

- [ ]

#### 43. Would you consider the experience described in the previous question as...

- [ ] Positive
- [ ] Negative
- [ ] Not Applicable
- [ ] Other (please specify)

[Image of a seal with text: GREAT SOUTHERN UNIVERSITY OF MIAMI COLESEUM]
**Demographics**

44. List Age

45. Specify Gender
- [ ] Female
- [ ] Male
- [ ] I chose to abstain from answering

46. Please indicate Ethnicity
- [ ] American Indian or Alaskan Native
- [ ] Asian
- [ ] Black or African-American
- [ ] Caucasian
- [ ] Hispanic
- [ ] Native Hawaiian or Other Pacific Islander
- [ ] Two or More Races
- Other (please specify)
Appendix C

Item Analysis Singing Perceptions and Participation Survey
Table 15

Frequencies for Likert Scale Singing Perception and Participation Survey Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree Nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I enjoy singing.</td>
<td>61</td>
<td>72</td>
<td>24</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>35.5%</td>
<td>41.9%</td>
<td>14%</td>
<td>6.4%</td>
<td>1.7%</td>
</tr>
<tr>
<td>2. I am a better singer than Most people I know.</td>
<td>7</td>
<td>25</td>
<td>48</td>
<td>54</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>4.1%</td>
<td>14.5%</td>
<td>27.9%</td>
<td>31.4%</td>
<td>21.5%</td>
</tr>
<tr>
<td>3. I am an average singer compared to most people I know.</td>
<td>3</td>
<td>51</td>
<td>56</td>
<td>36</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>1.7%</td>
<td>29.7%</td>
<td>32.6%</td>
<td>20.9%</td>
<td>14.5%</td>
</tr>
<tr>
<td>4. Singing is important in my life.</td>
<td>16</td>
<td>42</td>
<td>52</td>
<td>41</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>9.3%</td>
<td>24.4%</td>
<td>30.2%</td>
<td>23.8%</td>
<td>11.6%</td>
</tr>
<tr>
<td>5. I am a worse singer than most people I know.</td>
<td>17</td>
<td>38</td>
<td>50</td>
<td>49</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>9.9%</td>
<td>22.1%</td>
<td>29.1%</td>
<td>28.5%</td>
<td>9.9%</td>
</tr>
<tr>
<td>6. I believe singing is beneficial to me.</td>
<td>4</td>
<td>13</td>
<td>49</td>
<td>76</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>2.3%</td>
<td>7.6%</td>
<td>28.5%</td>
<td>44.2%</td>
<td>16.9%</td>
</tr>
<tr>
<td>7. I am not very good at singing.</td>
<td>33</td>
<td>57</td>
<td>27</td>
<td>43</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>19.2%</td>
<td>33.1%</td>
<td>15.7%</td>
<td>25%</td>
<td>6.4%</td>
</tr>
<tr>
<td>8. I am confident singing by myself in front of others.</td>
<td>39</td>
<td>59</td>
<td>35</td>
<td>33</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>22.7%</td>
<td>34.3%</td>
<td>20.3%</td>
<td>19.2%</td>
<td>2.9%</td>
</tr>
<tr>
<td>9. I dislike singing.</td>
<td>2</td>
<td>6</td>
<td>26</td>
<td>70</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>1.2%</td>
<td>3.5%</td>
<td>15.1%</td>
<td>40.7%</td>
<td>39%</td>
</tr>
<tr>
<td>10. I am confident I could sing the majority of pitches correctly in</td>
<td>53</td>
<td>42</td>
<td>22</td>
<td>43</td>
<td>11</td>
</tr>
<tr>
<td>a familiar melody.</td>
<td>30.8%</td>
<td>24.4%</td>
<td>12.8%</td>
<td>25%</td>
<td>6.4%</td>
</tr>
<tr>
<td>11. I am tone deaf.</td>
<td>50</td>
<td>54</td>
<td>38</td>
<td>17</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>29.1%</td>
<td>31.4%</td>
<td>22.1%</td>
<td>9.9%</td>
<td>5.8%</td>
</tr>
<tr>
<td>12. I am confident I could sing well in front of an audience if I was</td>
<td>27</td>
<td>63</td>
<td>27</td>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td>sang to me when I was young.</td>
<td>15.7%</td>
<td>36.6%</td>
<td>15.7%</td>
<td>17.4%</td>
<td>14%</td>
</tr>
<tr>
<td>13. My parent(s)/guardian(s) liked to sing.</td>
<td>16</td>
<td>60</td>
<td>52</td>
<td>35</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>9.3%</td>
<td>34.9%</td>
<td>30.2%</td>
<td>20.3%</td>
<td>4.7%</td>
</tr>
<tr>
<td>14. My parent(s)/guardian(s) often sang to me when I was young.</td>
<td>22</td>
<td>74</td>
<td>40</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>12.8%</td>
<td>43%</td>
<td>23.3%</td>
<td>16.3%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Item</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neither Agree Nor Disagree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>----------------</td>
<td>-------</td>
<td>----------------------------</td>
<td>----------</td>
<td>------------------</td>
</tr>
<tr>
<td>16. My parent(s)/guardian(s) encouraged me to participate in singing activities.</td>
<td>7.6%</td>
<td>23.8%</td>
<td>30.2%</td>
<td>26.2%</td>
<td>10.5%</td>
</tr>
<tr>
<td>17. I often sang with my family at home.</td>
<td>5</td>
<td>39</td>
<td>33</td>
<td>64</td>
<td>30</td>
</tr>
<tr>
<td>18. Singing was important to my family.</td>
<td>2.9%</td>
<td>12.2%</td>
<td>33.1%</td>
<td>33.7%</td>
<td>12.4%</td>
</tr>
<tr>
<td>19. Singing is important in my culture.</td>
<td>11.6%</td>
<td>23.3%</td>
<td>29.1%</td>
<td>23.8%</td>
<td>11.6%</td>
</tr>
<tr>
<td>21. My teachers at school encouraged me to sing.</td>
<td>10</td>
<td>46</td>
<td>62</td>
<td>39</td>
<td>14</td>
</tr>
<tr>
<td>22. Growing up singing was important to my friends.</td>
<td>5.8%</td>
<td>26.7%</td>
<td>36%</td>
<td>22.7%</td>
<td>8.1%</td>
</tr>
<tr>
<td>23. Growing up my friends encouraged me to sing.</td>
<td>2.3%</td>
<td>14%</td>
<td>32%</td>
<td>33.1%</td>
<td>16.9%</td>
</tr>
<tr>
<td>37. I can sing, but I don’t consider myself a singer.</td>
<td>15.8%</td>
<td>35.1%</td>
<td>21.3%</td>
<td>21.3%</td>
<td>6.2%</td>
</tr>
<tr>
<td>41. I stopped singing when my voice changed.</td>
<td>6%</td>
<td>8.1%</td>
<td>32.6%</td>
<td>15.7%</td>
<td>6.4%</td>
</tr>
</tbody>
</table>
Table 16

**Frequencies for Non-Likert Scale Singing Perceptions and Participation Survey Items**

<table>
<thead>
<tr>
<th>Item</th>
<th>Age 1-3</th>
<th>Age 4-6</th>
<th>Age 7-11</th>
<th>Age 12 or older</th>
<th>Still sing with me</th>
<th>Never sang to Me</th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. The age my parent or guardian stopped singing to me</td>
<td>7</td>
<td>28</td>
<td>22</td>
<td>6</td>
<td>30</td>
<td>29</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>4.1</td>
<td>16.3</td>
<td>12.8</td>
<td>3.5</td>
<td>17.4</td>
<td>16.9</td>
<td>28.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Elementary Teacher</th>
<th>Middle School Teacher</th>
<th>High School Teacher</th>
<th>Private Teacher</th>
<th>Religious Teacher/Leader</th>
<th>No One Ever Encouraged Me To Sing</th>
</tr>
</thead>
<tbody>
<tr>
<td>20. The people who encouraged me to sing were.....</td>
<td>75</td>
<td>47</td>
<td>29</td>
<td>17</td>
<td>43</td>
<td>52</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Preschool (2-5)</th>
<th>Elementary (5-11)</th>
<th>Middle School (12-15)</th>
<th>High School (16-18)</th>
<th>After High School (18 or older)</th>
<th>Friend Never Influenced Me</th>
</tr>
</thead>
<tbody>
<tr>
<td>24. The age at which my friends most influenced my decision to sing was:</td>
<td>7</td>
<td>36</td>
<td>21</td>
<td>16</td>
<td>9</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>4.1%</td>
<td>20.9%</td>
<td>12.2%</td>
<td>9.3%</td>
<td>5.2%</td>
<td>47.1%</td>
</tr>
</tbody>
</table>
Table 16 (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>At Home</th>
<th>At School</th>
<th>At House of Worship</th>
<th>In community/social organization</th>
<th>I Never Sang</th>
</tr>
</thead>
<tbody>
<tr>
<td>25. When I was in elementary school, I sang</td>
<td>94</td>
<td>124</td>
<td>67</td>
<td>26</td>
<td>18</td>
</tr>
<tr>
<td>26. In middle school, I sang</td>
<td>55.2%</td>
<td>72.9%</td>
<td>39.4%</td>
<td>15.2%</td>
<td>10.5%</td>
</tr>
<tr>
<td>27. In high school, I sang</td>
<td>98</td>
<td>74</td>
<td>61</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>28. Currently, I sing</td>
<td>58.3%</td>
<td>44%</td>
<td>36.3%</td>
<td>12.5%</td>
<td>14.2%</td>
</tr>
<tr>
<td></td>
<td>106</td>
<td>19</td>
<td>29</td>
<td>13</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>64%</td>
<td>11.5%</td>
<td>17.6%</td>
<td>7.9%</td>
<td>26.9%</td>
</tr>
<tr>
<td>Item</td>
<td>Solo in front of others</td>
<td>With a group in front of others</td>
<td>When I am by myself</td>
<td>I am never comfortable singing</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------------</td>
<td>-----------------</td>
<td>---------------------</td>
<td>-----------------------------</td>
<td></td>
</tr>
<tr>
<td>29. I am comfortable singing</td>
<td>36</td>
<td>86</td>
<td>144</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21%</td>
<td>50.2%</td>
<td>84.2%</td>
<td>9.3%</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Daily</td>
<td>Weekly</td>
<td>Monthly</td>
<td>Annually</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>--------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>30. On average I sing? (Include singing when no one is around.)</td>
<td>99</td>
<td>51</td>
<td>10</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>57.6%</td>
<td>29.7%</td>
<td>5.8%</td>
<td>1.7%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Item</td>
<td>1-5</td>
<td>6-10</td>
<td>11-15</td>
<td>16-18</td>
<td>18 or older</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-----</td>
<td>------</td>
<td>-------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>34. At what age did you decide you could sing. (self-identified singers)</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>4.7%</td>
<td>2.9%</td>
<td>2.3%</td>
<td>1.2%</td>
<td>0%</td>
</tr>
<tr>
<td>40. At what age did you decide you could not sing. (self-identified non-singers)</td>
<td>2</td>
<td>16</td>
<td>61</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1%</td>
<td>11.9%</td>
<td>45.5%</td>
<td>11.9%</td>
<td>1%</td>
</tr>
<tr>
<td>Note: Participant demographics are listed in Table 1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Female</th>
<th>Male</th>
<th>I chose to abstain from answering</th>
</tr>
</thead>
<tbody>
<tr>
<td>45. Specify Gender</td>
<td>106</td>
<td>63</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>62.3%</td>
<td>37%</td>
<td>0.5%</td>
</tr>
</tbody>
</table>