

# Favorite songs, melodic elements, and a familiar tune: Performance of children from Brazil and the United States on components of the ATBSS

Musicae Scientiae  
2015, Vol. 19(3) 265–281  
© The Author(s) 2015  
Reprints and permissions:  
sagepub.co.uk/journalsPermissions.nav  
DOI: 10.1177/1029864915597566  
msx.sagepub.com  


**Beatriz Ilari**

University of Southern California, USA

**Assal Habibi**

University of Southern California, USA

## Abstract

The AIRS Test Battery of Singing Skills (ATBSS) is a comprehensive instrument that was designed to acquire data from varied age, cultural and ethnic groups. The aim of the present research was twofold. First, it aimed to examine favorite songs and singing of melodic elements and a familiar tune using tasks from the ATBSS in two underrepresented groups of children: Brazilians in Brazil and Latinos in the United States. Second, the research aimed at contributing cultural data to the body of knowledge on the ATBSS. Two studies investigated singing behaviors in 48 children using two components from the ATBSS and a researcher-developed scale of children's musical habits that was completed by their parents. Findings were equivalent across both studies in that girls significantly outperformed boys in two singing tasks. Latino children in the U.S., however, showed higher singing test scores than their Brazilian counterparts. Consistent with previous research, these results suggest that gender and culture play important roles in singing development in middle childhood.

## Keywords

AIRS Test Battery of Singing Skills (ATBSS), cross-cultural research, gender, middle childhood, singing, underrepresented groups

Singing has often been described as a musical universal (Nettl, 1992). Cultural groups the world over engage with varied vocal repertoires that make use of a wide range of sounds and singing styles (Nix, 2012). Given that individual cultures prioritize specific sonorities over

---

## Corresponding author:

Beatriz Ilari, Thornton School of Music, Department of Music Teaching and Learning, University of Southern California, Los Angeles, CA 90089-0851, USA.

Email: [ilari@usc.edu](mailto:ilari@usc.edu)

others, singing practices exhibit both culture-general and culture-specific musical and non-musical attributes. For example, the vocal productions of a scat singer sound remarkably different from the sonorities of Inuit guttural singing, the hoarse timbres of the Flamenco *cantador*, and the potent voice of a soprano singing “O mio babbino caro” from Giacomo Puccini’s *Gianni Schicchi*. In other words, while all these singing practices fit into a general definition of vocal music (Nix, 2012), on an individual level, each one holds unique musical and non-musical attributes such as the organization of pitch and metric structures, specific use of the singing voice, historical origins and meanings, and mode of transmission from generation to generation, to name a few.

Another key aspect of human singing practices is the fact that they are intrinsically related to shared belief systems, values and lifestyles of specific societies and cultures (Ilari, Chen-Hafteck, & Crawford, 2013; Stadler Elmer, 2011). What, how, when, and where particular songs are performed and used varies immensely from one social group to the next, or even between different strata or contexts within a same group (Nettl, 1992). In some cultures, humans are expected to sing, alone or in groups, to embellish rites of passage like birthdays, weddings, and funerals. In others, there is a clear distinction between singers and non-singers (Ilari et al., 2013; Welch, 2005), with singing being less participatory and more presentational, that is, done by means of special performances aimed at specific audiences (Turino, 2008). But all in all, human singing practices fulfill a wide range of social functions across the lifespan, including emotional expression, communication, entertainment, and validation of social and cultural institutions (Merriam, 1964).

As members of sociocultural groups, children develop their singing skills very early in the course of development, through overlapping processes of musical enculturation and socialization (Campbell, 2011). While enculturation relates to the process of acquisition of culture-specific musical knowledge through everyday practices (Hannon & Trainor, 2007), socialization in a musical context refers to the ways through which members of a social group transmit social values and beliefs through shared practices and musical interactions (Campbell, 2011).

As a shared practice, singing begins in infancy. Parents and caregivers communicate in a musical fashion with their babies (Trevvarthen, 2008). They also sing and listen to a wide range of songs with them (Trehub & Schellenberg, 1995; Young, 2008), shaping, thereof, the musical environment in the home. As Welch (2005) contended, in the beginning of life, a child’s vocal production is constituted through “an interaction with the acoustic characteristics of the maternal culture” (p. 313). This is not surprising, given the fact that the family/home environment is a predominant socialization force in the early years (Young & Ilari, 2012). Singing behaviors during this period of life include musical babblings of babies (Tafari & Villa, 2002), toddlers’ repetitions of small melodic fragments (Dowling, 1984), preschoolers’ so-called *pot-pourri* songs that mix fragments of familiar tunes with improvised sounds (Moog, 1976), and spontaneous and invented songs (Barrett, 2006; Davidson, 1985; Young, 2004). Singing in early childhood is, therefore, a form of communication, vocal exploration, and play (Barrett, 2006; Young, 2004).

As children develop and grow in culture, their social worlds further expand, which bears clear implications on their singing practices. Experiences in educational settings, with the media and the commercial world that surrounds it and within the community at large, shape their overall musical experiences (Young & Ilari, 2012), including singing practices. For example, while children’s gendered stereotyping of singing may emerge during the preschool years (Warzecha, 2013), it certainly becomes more robust during middle childhood, or when children are roughly between the ages of 6 and 14. During this period, children undergo many cognitive changes that allow them “to reflect on their own successes and failures” (Eccles,

1999, p. 32), and to experience social comparisons and competition. Unsurprisingly, this is also a time when many children show beliefs that singing should be pursued primarily by those who are musically inclined (for a discussion see Ilari et al., 2013; Warzecha, 2013; Welch, 2005).

Paradoxically, it is also during the years of middle childhood that many children have opportunities to develop interests and show a wide range of competencies in several areas (Eccles, 1999), including in singing. Both singing range (Hargreaves, 1986) and pitch-matching accuracy (see Gooding & Standley, 2011), increase considerably during middle childhood. Singing of familiar and improvised songs also becomes more stable, and this is particularly true for songs that are built on stepwise motion and without too many leaps (for a review, refer to Gooding & Standley, 2011). Additionally, children in the age range of 5–7 also show some remarkable abilities to invent songs that follow conventions of the music of their culture, along with emotional expressivity (Welch, 2005).

It is not surprising, then, that much research has been devoted to study of the development of singing during middle childhood. These studies not only reinforce the notion that singing and song are ubiquitous in children's everyday lives (e.g., Campbell, 1998, 2011; Ilari, 2013b; Marsh, 2011), but also suggest that singing development is impacted by a wide range of factors. For instance, even if children's singing becomes gradually more sophisticated as they develop and grow, there are many individual differences in singing abilities within specific age groups (Stadler Elmer, 2011; Welch, 2005). While maturation is important, it should not be viewed as completely deterministic. Culture and experience, which are related to the aforementioned processes of enculturation and socialization, also play major roles in the development of the singing voice (Stadler Elmer, 2011; Welch, 2005). Likewise, gender differences have been found in several studies that investigated children's singing behaviors, with girls often outperforming boys in different singing tasks, and often showing more positive attitudes towards singing than boys (see Leighton & Lamont, 2006; Mang, 2006; Stadler Elmer, 2011; Welch, 2005; Welch, Sergeant, & White, 1997).

Different theories, models, and measures of singing and vocal development have been proposed (Hargreaves, 1986; Rutkowski, 1998; Stadler Elmer, 2011; Welch, 2005). With some exceptions (Mang, 2006), most of them have been designed, tested, and used in studies with children from the so-called WEIRD (white, educated, industrialized, rich, and democratic) societies (Heinrich, Heine, & Norenzayan, 2010). Research that investigates the development of singing in children from other cultural groups is still scarce (Stadler Elmer, 2011), despite its relevance for our understanding of potential universals in song and the singing voice. To complicate matters, the integration of findings from current studies on singing and vocal development in middle childhood is difficult, as there are no consistencies in terms of measurements, testing procedures, analytical approaches, and scoring systems (e.g., Kreutzer, 2001; Moore, Chen, & Brotons, 2004; Sergeant & Welch, 1996). As Cohen, Armstrong, Lannan, and Coady (2009) have advanced, there are many questions concerning singing development that need to undergo urgent empirical scrutiny. Are there universal stages of singing development? Are gender differences in singing abilities that have been documented time and again culture-specific? Does formal music education help or hinder the development of singing accuracy in children? Are there differences in children's attitudes to singing across age, gender, and culture? One way to properly address these questions is to collect examples of singing in systematic and controlled ways from a wide range of age, cultural and ethnic groups (Cohen et al., 2009).

In recent years, new instruments have been designed to assess the development of singing skills in children and adults (i.e., Cohen et al., 2009; Demorest et al., 2015). With much attention to developmental, educational, and cultural issues, the AIRS Test Battery of Singing Skills

or ATBSS (Cohen, 2012; Cohen et al., 2009) was designed to acquire data from varied age, cultural, and ethnic groups. The ATBSS is a comprehensive instrument consisting of 11 components that include: (1) opening conversation; (2) determine vocal range; (3) minor third participant-name-call-back; (4) Sing back “Brother John” song all, as 8 phrases, and all; (5) sing favorite song; (6) sing back interval, triad, scale, herein called, *musical elements*; (7) improvise ending of a song; (8) free composition to choice of picture; (9) Sing back unfamiliar song “We are one” by Carolyn McDaid, (10) sing “Brother John” from recent memory; and (11) closing conversation. Each component serves one or more specific research purposes. Component 6, for example, was designed to measure singing accuracy and to model song performance from the performance of musical elements (for a detailed discussion of task purposes see Cohen et al., 2009). At this time, researchers across the world have taken on the task of adapting the ATBSS to different cultural groups and testing it, as a means to generate data and help with its standardization.

The aim of the present research was twofold. First, it aimed to examine favorite songs and singing of melodic elements and a familiar tune in children, using tasks from the ATBSS, in two underrepresented cultural groups: Brazilians in Brazil and Latino children residing in the United States. Second, the research aimed at contributing cultural data to the body of knowledge on the ATBSS.

## Overview of the studies

Conducting research with children is known to be challenging. Beginning with recruitment, consent and assent are some initial challenges that researchers face. Next, there is the need to design tasks that are appropriate for child participants, who have their own ways of being in the world. Adding comparisons between cultural groups creates yet another layer of complexity to any study of children’s engagement with music, as culture is directly linked to musical and research practices (see Ilari & Young, in press). Singing, in turn, is not only cultural, but is also a social act (Ilari et al., 2013). Singing in the presence of others can be seen as a daunting task, for adults and children alike.

Taking these issues into account, two studies of singing by children from two distinct cultural groups (e.g., Brazil and the U.S.) were conducted. Instead of taking a strictly cross-cultural approach in which two cultural groups are tested under the exact same conditions and in a same study, two separate studies on selected children’s singing skills using two components of the ATBSS were conducted. There are some reasons for this state of affairs. First, although both groups shared some commonalities like living in large urban centers and a relative cultural proximity, there were some important differences between them, including age, social class, and social standing. Second, testing conditions were different for each study due to contextual issues. Therefore, each study is described separately followed by a combined analysis of data.

## Study I

Children’s singing is both complex and multifaceted, and can be assessed in many different ways (Leighton & Lamont, 2006). While the development of singing may, indeed, follow a pre-determined universal sequence of events (for a discussion see Welch, 2005), there are many factors that influence children’s singing including gender, ethnicity, and culture. Gender, in particular, has been shown to be influential in children’s singing behaviors and attitudes towards singing. Girls often outperform boys in singing tests (e.g., Leighton & Lamont, 2006; Welch et al., 1997). Likewise, gendered attitudes towards singing emerge in the course of child

development (e.g., Andang'o & Pacheco, in press). An example is the classic "problem of the missing males" in choral music education, which has been reported in different Anglophone countries (Freer, 2009; 2010; Harrison, 2004; Welch, Saunders, Papageorgi, & Himonides, 2012). Yet a critique that could be made about these studies is the fact that they have centered primarily on European and North American children. Limited research exists to date on the singing practices of children from other parts of the world. Therefore, the aims of the present study were to examine favorite songs and singing of melodic elements and a familiar tune in school-aged Brazilian children.

## Method

**Participants.** Brazilian children were recruited from an elementary school in a large city in the state of São Paulo. Invitation letters, consent forms, and a short questionnaire on children's singing behaviors and demographics were sent out by the school principal to families with children who were attending first, second, and third grades. Parents who agreed to have their children take part in the study were asked to return questionnaires and signed consent forms to the classroom teacher, who forwarded them to the researcher. Upon receipt of these documents, the researcher scheduled a testing session with each individual child. The participants in the present study were 24 middle class Brazilian children (13 girls, 11 boys), aged 7–8, with a mean age of 7.54 ( $SD = 0.50$ ). All children were monolingual Portuguese speakers, and none attended music lessons or had music classes in school at the time of the study. None of the children had a professional musician in their immediate family. Additional data from 12 children were excluded due to engagement in private music lessons ( $n = 2$ ), age outside of the study window ( $n = 8$ ), or refusal to sing ( $n = 2$ ). Participating children received a small gift as a token of appreciation for their time and effort.

**Apparatus and procedure.** Children were tested individually in a quiet room at their elementary school. Individual testing sessions lasted between 10 and 18 minutes, and were recorded using a Sony ICD-PX333 digital voice recorder. The software Audacity version 2.0.0 was installed on a Macintosh portable computer and used for recording purposes as a backup to the digital recorder. The first author, who is a native speaker of Brazilian Portuguese and a trained musician and music educator, collected all the data. The researcher sang each task using pre-recorded prompts that were prepared by the AIRS<sup>1</sup> research team, with the exception of component 4 (i.e., *Motorista* in Portuguese), which was recorded by the first author. Much encouragement was provided for children who were either too shy to sing or exhibited difficulties with the tasks, but without providing too many cues (see Adachi & Trehub, 2011).

**Testing materials.** Children were tested on the full ATBSS (Cohen, 2012; Cohen et al., 2009; Raju & Ross, 2012), which was translated into Portuguese and adapted for the Brazilian context by the first author. Children were also asked to sing the well-known "Happy Birthday" song, which has been used in several earlier research projects (e.g., Mang, 2006; Pfordresher, Brown, Meyer, Belik & Liotti, 2010). Although not part of the ATBSS, this singing task was included because in the adaptation to Brazilian culture and piloting of the ATBSS in Brazil, it became evident that there was much variance in terms of participants' knowledge of and ability to sing Brother John. This song exists in Brazil with many different lyrics, tempi, and intervallic variances (e.g., "Dom Martinho", "Meus dedinhos", "Motorista", "Meu lanchinho", "Está chovendo"). Therefore, a task that involved singing "Happy Birthday" (Parabéns a você) was added at the end of

Please circle the number under the statement that most accurately reflects your child's engagement with music. Please respond on the basis of what you think your child is like now, not how s/he might have been in the past.

	<i>never</i>	<i>rarely</i>	<i>sometimes</i>	<i>very often</i>	<i>always</i>
<i>My child sings spontaneously.</i>	1	2	3	4	5
<i>My child sings when asked.</i>	1	2	3	4	5
<i>My child asks to listen to a specific song.</i>	1	2	3	4	5
<i>My child sings to her/himself when playing.</i>	1	2	3	4	5
<i>My child makes up her/his own songs.</i>	1	2	3	4	5

**Figure 1.** Parental reports of children's singing habits in everyday life.

the testing session, to allow for documentation of a song that was familiar to all participants, and subsequent comparisons with items 5 and 6.

Because singing is known to be contextual (Stadler Elmer, 2011; Welch, 2005), parents also completed a two-part questionnaire that inquired about (1) family demographic information and musical background, and (2) children's singing habits in everyday life. Section 2 of the questionnaire was modeled after Kirschner and Ilari (2014), and centered on parental reports regarding the frequency of observed children's singing and song listening habits at the time of the study (see Figure 1).

### Data analysis

For the purpose of this paper, only two components of the ATBSS were analyzed, as they allowed for some comparison with data from Study 2. These were: component (5) sing favorite song; and component (6) sing back interval, triad, and scale (see Figure 2).

Sung renditions of "Happy Birthday" were also analyzed because, unlike the case of Brother John (components 4 and 10 of the ATBSS), this was a song that all children knew well and sang with the same words and melody. Sung renditions of "Happy Birthday" and musical elements (i.e., item 6 of the ATBSS) were analyzed using Rutkowski's (1998, 2015) Singing Voice Development Measure or SVDM, one of the most well-known rating scales of children's use of the singing voice (refer to Figure 3). SVDM makes use of a 9-point-scale to describe how children's singing voices develop from the (1) "pre singer" to the (5) "singer" stage, with 7 sub-stages in between (Rutkowski, 1998).

Considered a robust measure of the development of the singing voice (Salvador, 2010), several studies that used SVDM as their rating scale showed an inter-rater reliability of .80 and beyond (Levinowitz et al., 1998; Rutkowski, 1998; Rutkowski & Miller, 1994). SVDM can be used to assess singing achievement in both sound patterns and intact songs (Guerrini, 2002), and it could therefore be used with the ATBSS. There is also a strong correlation between SVDM scores and singing accuracy in child singers (Rutkowski, 2015), which is another strength of this measurement.

Singing data analysis was conducted as follows. Individual tasks from item 6 of the ATBSS (i.e., intervals, triad, and scale, see Figure 2) were first scored individually and then averaged in

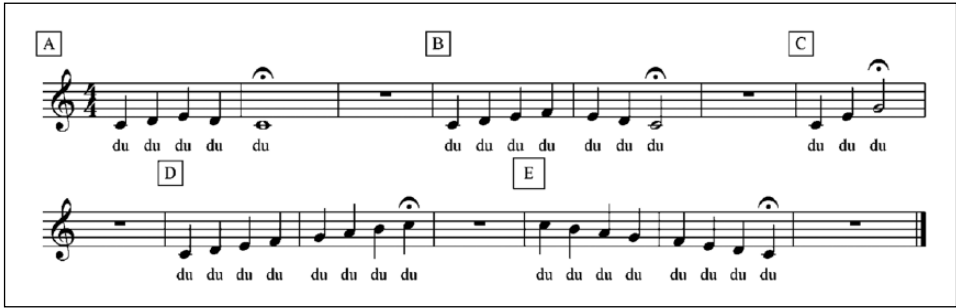


Figure 2. Musical elements: Singing tasks from component 6 of the ATBSS.

1	<i>Pre-singer</i>	Does not sing but chants the song text
1.5	<i>Inconsistent Speaking Range Singer</i>	Sometimes chants, sometimes sustains tones and exhibits some sensitivity to pitch but remains in the speaking voice range, lower register (usually A3 to C4).
2	<i>Speaking Range Singer</i>	Sustains tones and exhibits some sensitivity to pitch but remains in the speaking voice range, lower register (usually A3 to C4).
2.5	<i>Inconsistent Limited Range Singer</i>	Wavers between lower and middle registers and uses a limited range when in middle register (usually up to F4)
3	<i>Limited Range Singer</i>	Exhibits consistent use of limited range (usually D4 to F4).
3.5	<i>Inconsistent Initial Range Singer</i>	Sometimes only exhibits use of limited range, but other times exhibits use of initial range (usually D4 to A4).
4	<i>Initial Range Singer</i>	Exhibits consistent use of initial range (usually D4 to A4).
4.5	<i>Inconsistent Singer</i>	Sometimes only exhibits use of initial range, but other times exhibits use of extended singing range, upper register (sings beyond the lift to upper register: B4-flat and above)
5	<i>Singer</i>	Exhibits use of consistent extended range, upper register (sings beyond the lift to upper register: B4-flat and above).

Figure 3. *Singing Voice Development Measure (SVDM)*. A measure of children’s use of the singing voice (and not vocal accuracy). Copyright © Joanne Rutkowski. Published with the author’s permission.

a composite score. Two experienced music educators, who were also expert singers, rated children’s sung renditions of musical elements and “Happy Birthday”. Correlation coefficients were calculated to examine inter-rater reliability for each item and yielded the following results: musical elements ( $r = .85$ ), and “Happy Birthday” ( $r = .88$ ). Average ratings from the two expert raters were used in the analysis. With regards to component 5, given that most children did not sing their favorite song but rather described it to the researcher, this task was analyzed using frequency counts and descriptions. Parental ratings of children’s singing and song listening behaviors, herein called singing habits, were also entered into the statistics software. We used an alpha level of .05 for all statistical tests.

**Results**

Means and standard deviations (in parentheses) for renditions of both musical elements and “Happy Birthday”, and singing habits, were computed and are summarized in Table 1.

**Table 1.** Means and standard deviations for expert ratings of singing test and habits of Brazilian children.

	Musical Elements	N	“Happy Birthday”	N	Singing habits	N
Girls	3.21 (0.97)	13	3.46 (0.91)	13	4.1 (0.53)	12
Boys	2.29 (1.02)	11	2.5 (0.94)	10	3.45 (0.74)	11
All	2.78 (1.08)	24	3.04 (1.02)	23	3.79 (0.72)	23

Because gender differences have been found in several studies that investigated children’s singing behaviors (see Mang, 2005; Stadler Elmer, 2011; Welch, 2005; Welch, Sergeant, & White, 1995, 1996), we examined its effects on three separate dependent measures including musical elements, “Happy Birthday”, and singing habits using a series of univariate analysis of variance (ANOVAs). Brazilian girls showed significantly higher scores in all tasks: pitch matching [ $F(1,22) = 4.95, p = .036$ ], “Happy Birthday” [ $F(1,21) = 6.06, p = .022$ ]. Parents also indicated a higher proportion of singing habits in girls than boys [ $F(1, 21) = 5.72, p = .026$ ]. Additionally, a mixed model analysis of variance (ANOVA) was carried out with task (musical elements, “Happy Birthday” and singing habits) as within-subjects factors and gender as a between-subjects factor. Brazilian girls, compared to boys, showed better performance equally in all three tasks as indicated by significance of gender, in favor of girls, as a main effect [ $F(1, 20) = 6.94, p = .01$ ] and absence of an interaction between task and gender [ $F(2, 40) = 0.53, p = .59$ ].

In terms of favorite songs, only three children stated that they did not have one. Among the children who reported having a favorite song, 5% indicated a song from a movie soundtrack (i.e., Barbie), 9% mentioned a preference for a tune learned in school for a special festivity known as *Festa Junina*,<sup>2</sup> against the vast majority (76%), who indicated that they liked a pop tune best. Within the latter group, there was a slight preference for international pop tunes in English (56%) over Brazilian pop tunes in Portuguese (44%). These included songs by artists and bands such as Rihanna, Scorpions, Lady Gaga, Iron Maiden, Black Eyed Peas, Milton Nascimento, Skank, and Legião Urbana. It was also noteworthy that, while most children reported having a favorite tune, only six (5 girls) of them (25%) agreed to sing it to the researcher.

## Discussion

Results from Study 1 are consistent with the international literature in that gender differences were found for children’s use of the singing voice (see Welch, 2005; Warzecha, 2013). Girls’ sung renditions received higher scores, not only for the pitch matching tasks as commonly described in the literature (Mang, 2006), but also in a task that required singing a familiar song from memory. Parental reports also suggested that there were pronounced gender differences in singing behaviors in everyday life, with girls engaging with singing practices more often than boys. This is not only consistent with literature on gendered attitudes towards singing in childhood (e.g., Siebenaler, 2008), but also aligns well with recent studies on motivation and gendered behaviors of Brazilian children (Gosso, Salum e Morais, & Otta, 2007).

It was also interesting that children indicated a strong preference for pop tunes, many of which were in a foreign language (i.e., English). Even if children in this study couldn’t necessarily understand the words of the songs, they still enjoyed singing and listening to them. This finding can be interpreted in at least two ways. A first explanation refers to the pervasiveness of



popular music in the everyday lives of children from very early on (Marsh, 1999), including from dominant cultures where English is spoken. Yet, it was also interesting that most favorite tunes cited by participating children consisted of famous hits from the 1990s. This was the time when the parents of most participating children were probably in their youth. What this finding suggests is that while the school and the community at large function as important socialization forces in middle childhood (see Eccles, 1999), the home environment (and parents, in particular) continues to be an important source of musical influence in their lives (e.g., Serbin & DeBono, 2010).

Results from this study also raise some important questions that are relevant for our understanding of singing as a universal behavior. But are these findings exclusive to Brazil, or are they applicable to other cultures as well? Are gender differences in singing spread across Latin cultures? And if so, in what ways? These questions served as motivations to conduct Study 2.

## Study 2

Attempting to address the questions posed in the abovementioned discussion, Study 2 examined singing practices in a group of Latino children in the United States. This cultural group was selected for three main reasons: (1) relative cultural proximity to Brazilian culture, (2) underrepresentation in music education and music psychology research; and (3) reasons of convenience (i.e., the authors were already working with Latino children as they are taking part in a longitudinal developmental study).

Latino is a term that is used in the United States, particularly in the West Coast, to designate migrants from Latin America who have Spanish as their first language (Valencia, 2004). A common misconception is to consider Latino a nationality. The term Latino encompasses more than 20 nationalities and includes a wide range of racial, ethnic, and cultural groups. Latinos are the largest minority group in the United States and also the largest growing segment of the population. According to Valencia (2004), fewer than 44% of Latinos in the United States hold a high school diploma, most work in service-related industries, and approximately 23% live below poverty levels. Furthermore, there are four elements that characterize Latino culture: *familismo* (i.e., the family at the core of society), *machismo* (i.e., central role of men), *marianismo* (i.e., adoration of Mary, mother of Jesus, as is common to many Catholic cultural groups), and *personalismo* (i.e., great value placed on interpersonal relationships). As noted, little research exists to date on the musical development of Latino children in the U.S., particularly where singing is concerned. Using components 5 and 6 from the ATBSS, and “Happy Birthday”, we examined favorite songs and singing of melodic elements and a familiar tune in Latino children.

## Method

**Participants.** Latino children residing in a large city in Southern California, who are currently taking part in a longitudinal study on brain and cognitive development (Habibi et al., 2014), took part in this study. They were recruited from two local public elementary schools and two free-of-charge, after-school enrichment programs in the downtown area of a large urban center. The two programs offered homework assistance and instruction in sports (soccer) and music (introduction to group instrumental music). Admittance to these after schools programs is done by lotteries. Children were recruited from these programs at the beginning of their instruction and within the first few months of participation. An equivalent number of children from public schools and after-school programs took part in this study.

**Table 2.** Means and standard deviations for expert ratings of singing test and habits of Latino children in the U.S.

	Musical elements	N	“Happy Birthday”	N	Singing habits	N
Girls	3.84 (0.73)	12	3.70 (0.93)	11	3.76 (0.82)	11
Boys	2.69 (0.98)	12	2.81 (0.82)	11	3.10 (0.84)	11
All	3.03 (1.07)	24	3.15 (0.99)	22	3.61 (0.80)	22

Participants in the present study were 24 children (12 girls, 12 boys) of Latino ethnicity with a mean age of 7.04 years ( $SD = 0.28$ ). All children came from working class families, were bilingual speakers of Spanish and English, and none were taking formal music lessons at the time of the study. Most child participants (approximately 60%) did not have music classes in their regular schools, and none had a professional musician in their immediate family. Participating children received a small gift as a token of appreciation for their time and effort.

**Apparatus and procedure.** The same apparatus and procedures that were used in Study 1 were used here. However, there were four differences. First, children were either tested in a quiet room of the after-school program facility or at the university, instead of their local school. Second, testing took place within the context of a 1-hour test battery that included a wide range of cognitive, motor, and social-emotional tests. The singing test was administered right after children completed a test of cognitive abilities with 4 components, which lasted for about 30 minutes. That is, children completed 2 components of the ATBSS, and then sang “Happy Birthday” to the experimenter. Singing tests lasted between 5–8 minutes. Third, two female experimenters shared the data collection. And fourth, parental questionnaires were administered either in Spanish or English, according to the needs of each parent or legal guardian. Singing tests, however, were administered in English.

**Testing materials.** Children were tested on the following items: ATBSS components (5) musical elements and (6) singing a favorite song, and singing “Happy Birthday” from memory.

## Results

As in Study 1, the same experienced music educators rated all singing samples. Reliability for each task was computed for musical elements ( $r = .99$ ), and “Happy Birthday” ( $r = .72$ ). Means and standard deviations (in parentheses) for renditions of musical elements, “Happy Birthday” and singing habits, were computed and are summarized in Table 2.

Similarly to Study 1, univariate analysis of variance (ANOVAs) were computed and confirmed that Latino girls received higher scores in both tasks than boys for musical elements [ $F(1,22) = 10.42, p = .003$ ] and “Happy Birthday” [ $F(1,21) = 5.58, p = .028$ ]. Although parents reported a higher proportion of singing habits in girls than boys, this difference was not above chance levels [ $F(1,20) = 3.38, p > .05$ ]. Additionally, while Latino children had higher scores for “Happy Birthday” (mean = 3.15  $SD = 0.996$ ) than for musical elements (item 6 of the ATBSS) (mean = 3.03,  $SD = 1.076$ ), this difference was not significant at the .05 level [ $t(46) = 0.97, p > .05$ ].

In terms of favorite songs, six children (25%) stated that they did not have one. Among the children who reported having a favorite song, 12% indicated a preference for a theme from a

movie soundtrack (e.g., “Frozen song”), 17% mentioned a preference for a school tune, (e.g., “Itsy Bitsy Spider”), 17% mentioned a different style (e.g., “The Battle of Jericho”), and 54% stated that they liked a pop tune (e.g., Rihanna, Justin Bieber, Drake). Only one child mentioned a preference for a song in the Spanish language. Additionally, while many children reported having a favorite tune, only four (3 girls) agreed to sing it to the researcher.

### Combined analyses of Studies 1 and 2

Given the relative scarcity of cross-cultural research in music (Stevens, 2012), particularly in reference to the development of the singing voice (Stadler Elmer, 2011), it was interesting to compare results from Studies 1 and 2.

First, multivariate analyses of variance (MANOVAs) with country of origin (Brazil, USA) and gender as between-subjects factors were performed separately for each dependent measure including scores on musical elements, “Happy Birthday”, and singing habits. Results showed a significant effect of gender in favor of girls for all three measures: musical elements [ $F(1,45) = 14.7, p < .001$ ], “Happy Birthday” [ $F(1,42) = 11.91, p = .001$ ], and singing habits [ $F(1,42) = 8.78, p = .004$ ]. Relative to the Brazilian participants, the Latino group performed better on musical elements and “Happy Birthday”, but were rated lower on singing habits. The difference for “Happy Birthday” and singing habits was not significant between the groups.

Subsequently, a repeated measures ANOVA with scores (musical elements, “Happy Birthday”, and singing habits) as within-subjects factors, and country of origin (Brazil, USA) and gender as between-subjects factors was performed. Mauchly’s test indicated that the assumption of sphericity was not violated. Results showed a significant effect of gender [ $F(1, 38) = 19.02, p < .001$ ] in favor of the girls and a significant interaction between country and tasks [ $F(2, 76) = 3.59, p = .03$ ], where Latino children performed better in musical elements and “Happy Birthday” tasks but were rated lower than Brazilian children in singing habits. There was no significant interaction between gender, country, and signing test scores [ $F(2,76) = 0.06, p > .05$ ].

It was also interesting to note that, although Brazilian children were significantly older than their Latino counterparts [ $t(46) = 3.85, p < .001$ ], there were no correlations between age and musical elements ( $r = -.08, n.s.$ ), age and “Happy Birthday” ( $r = -.06, n.s.$ ), and age and singing habits ( $r = .00, n.s.$ ). The results remained the same when correlations were calculated for each cultural group separately. There were no significant correlations between age and musical elements in Brazil ( $r = .09, n.s.$ ) and in the United States ( $r = -.068, n.s.$ ); no significant correlations between age and “Happy Birthday” in Brazil ( $r = .011, n.s.$ ) and in the U.S. ( $r = -.106, n.s.$ ); and no significant correlations between age and singing habits in Brazil ( $r = -.342, n.s.$ ) and in the U.S. ( $r = .18, n.s.$ ).

### General discussion

Even if there were some differences between the two studies reported here in terms of the number of components from the ATBSS that were used, testing conditions (i.e., while children in Study 1 were tested solely on the ATBSS, in Study 2, singing tasks were but one small component of a large battery), and social class (e.g., children in Brazil were from a higher SES), some interesting findings emerged.

Gender and culture appeared to be stronger forces than age and social class in ratings of children’s sung performance and singing habits. Working class Latino children in the current study outperformed their middle class Brazilian counterparts in two singing tasks: musical elements and “Happy Birthday” (singing a familiar tune from memory), even after the completion

of challenging cognitive tests. While some would immediately jump to the conclusion that this was an effect of age, correlations between age and singing suggested otherwise. These findings may be linked to the values associated with singing and schooling in both societies. Singing has been viewed as an integral part of public school music education throughout the history of the field in the United States (see Marks & Gary, 2007). Conversely, music (and singing in particular) has not been consistently valued as a school matter in Brazil. It is possible, then, that the superior performance in singing tasks in Latino children was due to what Welch (2005) called a “school effect” or positive effects of exposure to singing models in music classes. Alternatively, our results could also be explained by the pervasiveness of testing in American education (Hursh, 2005). It is possible that Latino children in our study were simply more familiar with one-on-one tests than their Brazilian counterparts. Even if the Latino children had just enrolled in the longitudinal study and were being tested for the first year (see Habibi et al., 2014), it is still possible that their familiarity with standardized tests (through siblings, friends, and school) influenced their performance. These questions obviously cannot be answered by the present study alone and merit attention in future research.

Still regarding the use of the singing voice (Rutkowski, 1998), it was interesting that both Brazilian children in Brazil and Latino children in the United States had average singing scores that were around 3, which corresponds to “Limited range singers” (Rutkowski, 1998; Rutkowski & Miller, 2003; see Figure 1). These results corroborate previous findings from studies conducted in the United States (see Levinowitz et al., 1998; Rutkowski & Miller, 2003). Yet, children’s scores for the present studies were lower if compared with the scores obtained in two previous studies conducted with Chinese students in Hong Kong (Mang, 2006) and the UK (Welch et al., 2011). These results not only reinforce the notion that culture plays a large role in children’s singing, but also urge for a better understanding of the factors that account for these differences, such as family, schooling, traditions and values, among others.

Cultural differences aside, this study also found some interesting similarities between the two groups of children that are consistent with the literature. As many have suggested, gender appears to be a driving force in children’s singing development (Mang, 2006; Mizener, 1993; Siebenaler, 2008; Welch, 2005; Welch et al., 1997). In the present study, singing was rated consistently higher for girls than boys, from both South and North America. The same occurred with singing habits, although the latter were significant only in Brazil (which may be related to different uses of the rating scales). Still, girls in both countries were also more willing to sing their favorite tunes to the researcher than boys. As noted earlier, middle childhood is an important time for the development and construction of identities, including gender identity (see Eccles, 1999). As Dibben (2002) contended, gender identity is a byproduct of socialization and enculturation processes. By observing others behave in gender-specific ways and receiving approval for such behaviors, children begin to emulate them (Dibben, 2002). It is possible, then, that child participants in our study were already influenced by the widespread notion of singing as a feminine act that is pervasive in the Western world, as well as by the idea that singing “neither constructs nor defends masculinity” (Hall, 2005, p. 6). This is also consistent with the idea that different degrees of *machismo* continue to be common to this date in Latin American cultures and cultural groups (see Beattie, 2002; Valencia, 2004). Another important issue to consider is the fact that female researchers collected data in both countries, which may have influenced the results. Future research could examine the role of researcher gender on children’s performance on singing tests.

Gender differences aside, our data further suggest that age should not be viewed as completely deterministic when examining children’s singing behaviors and habits. This aligns with the idea of singing development as being multidirectional and complex, and not necessarily linear (see Stadler Elmer, 2011). In other words, more than being completely age-specific, the

development of singing in children relies on “neuropsychobiological activity, potential, and change, interfaced with, and shaped by, particular socio-cultural environments in which certain patterns of sound characterize the dominant musical genres” (Welch, 2005, p. 325).

Children’s indications of favorite songs are also worthy of commentary. Preferences for popular music have long been established in studies with tweens and adolescents (for a review see North & Hargreaves, 2010), and recent studies are confirming this trend with slightly younger children (e.g., Ilari, 2013a). It was also interesting to note children’s strong preference for the music of their parents’ youth (see Krumhansl & Zupnick, 2013), and for pop tunes in the English language in both countries. This last finding is consistent with Abril’s (2002) work with bilingual/bicultural children in the United States, who have also shown a preference for songs from the dominant culture and language. But even more interesting was children’s general refusal to sing these favorite tunes. Why did this occur? There are some possible answers to this question, including: (1) the fact that many songs were beyond children’s comfortable singing ranges; (2) the overall sense that the song could not be sung in a proper fashion without the recording; (3) the notion that these songs were part of their private worlds, which could only be shared with a few selected individuals (see Gluschkankof, in press); or (4) the stress related to singing in front of others, as has been found with adults (Levitin, 2013). These are important questions that need to go under urgent scrutiny, as they have clear implications for both research and practice in singing.

## Concluding remarks

Few studies to date have examined singing practices in light of culture, particularly where children are concerned. Yet, it is only through a thorough understanding of how humans engage with singing across different cultural groups that questions concerning singing as a musical universal can be fully answered. The ATBSS plays an important role in answering these questions. It is a versatile instrument that was designed to be easily adapted for research with different cultural groups across the world. While each individual component may offer insights into one or more important attributes related to the singing voice, as we have demonstrated in this paper, in its entirety, the ATBSS provides a complex, dynamic, and rich picture of singing. We have plans to retest children in Brazil using the entire ATBSS, to understand the developmental course of singing in this population. We will also continue to collect data using the two above-mentioned components of the ATBSS with children in the longitudinal study (Habibi et al., 2014), in the hopes of making a contribution to the study of children’s singing in cultural and cross-cultural perspectives.

## Acknowledgements

We would like to thank all those involved in the study: child participants and their families, teachers, principals and program directors, and research assistants in both countries. We are also grateful to Professor Joanne Rutkowski for granting permission to publish the SVD (figure 3), and to two anonymous reviewers for their insightful comments on earlier versions of this work.

## Funding

This study was funded in part by the Social Sciences and Humanities Research Council of CANADA (SSHRC) Major Collaborative Research Initiative Program (MCRI).

## Notes

1. AIRS stands for Advancing Interdisciplinary Research in Singing. This is a research initiative led by Dr. Annabel Cohen, which unites researchers from diverse fields, who are investigating the phenomenon of singing.

2. *Festa Junina* is a Brazilian festivity that happens in the month of June, to celebrate the European Midsummer (known by many as St. John's Day). Regardless of religious backgrounds, schools in Brazil typically celebrate *Festa Junina* with a party, where children and adults sing and dance to some traditional songs. In most schools, preparations for *Festa Junina* are the responsibility of either the physical education teacher or the classroom teacher.

## References

- Abril, C. R. (2002). Children's attitudes towards languages and perceptions of performers' social status in the context of songs. *International Journal of Music Education*, 39(1), 65–74.
- Adachi, M., & Trehub, S. E. (2011). Canadian and Japanese preschoolers' creation of happy and sad songs. *Psychomusicology: Music, Mind & Brain*, 21(1 & 2), 69–82.
- Andang'o, E., & Pacheco, C. B. (in press). Belonging and identity: Exploring gendered meanings of musicking in 7-year-olds. In B. Ilari & S. Young (Eds.), *Home musical experiences of children across the world*. Bloomington: Indiana University Press.
- Barrett, M. (2006). Inventing songs, inventing worlds: The "genesis" of creative thought and activity in young children's lives. *International Journal of Early Years Education*, 14(3), 201–220.
- Beattie, P. M. (2002). Beyond machismos: Recent examinations of masculinities in Latin America. *Men & Masculinities*, 4(3), 303–308.
- Campbell, P. S. (1998). *Songs in their heads*. Oxford, UK: Oxford University Press.
- Campbell, P. S. (2011). Musical enculturation: Sociocultural influences and meanings of children's experiences in and through music. In M. S. Barrett (Ed.), *A cultural psychology of music education* (pp. 61–81). New York, NY: Oxford University Press.
- Cohen, A. (2012). Creativity in singing: Universality and sensitive developmental periods? In D. J. Hargreaves, D. Miell, & R. Macdonald (Eds.), *Musical imaginations: Multidisciplinary perspectives on creativity, performance, and perception* (pp. 173–192). New York, NY: Oxford University Press.
- Cohen, A., Armstrong, V. L., Lannan, M. S., & Coady, J. (2009). A protocol for cross-cultural research on the acquisition of singing. *Annals of the New York Academy of Sciences*, 1169, 112–115.
- Davidson, L. (1985). Tonal structures of children's early songs. *Music Perception*, 2(3), 361–373.
- Demorest, S., Pfordresher, P., Dalla Bella, S., Hutchins, S., Loui, P., Rutkowski, J., & Welch, G. F. (2015). Methodological perspectives on singing accuracy: An introduction to the special issue on singing accuracy (part 2). *Music Perception*, 32(3), 266–271.
- Dibben, N. (2002). V. Constructions of femininity in 1990s girl-group music. *Feminism & Psychology*, 12(2), 168–175.
- Dowling, W. J. (1984). Development of musical schemata in children's spontaneous singing. In W. R. Crozier & A. J. Chapman (Eds.), *Cognitive processes in the perception of art* (pp. 145–163). Amsterdam: North-Holland.
- Eccles, J. (1999). The development of children ages 6 to 14. *The Future of Children*, 9(2), 30–44.
- Freer, P. K. (2009). Boys' descriptions of their experiences in choral music. *Research Studies in Music Education*, 31(2), 142–160.
- Freer, P. K. (2010). Two decades of research on possible selves and the "missing males" problem in choral music. *International Journal of Music Education*, 28(1), 17–30.
- Gluschkankof, C. (in press). Public and secret musical worlds of children. In B. Ilari & S. Young (Eds.), *Home musical experiences of children across the world*. Bloomington: Indiana University Press.
- Gooding, L., & Standley, J. M. (2011). Musical development and learning characteristics of students: A compilation of key points from the research literature organized by age. *Update: Applications of Research in Music Education*, 30(1), 32–45.
- Gosso, Y., Salum e Morais, M., & Otta, E. (2007). Pretend play of Brazilian children: A window into different cultural worlds. *Journal of Cross-Cultural Psychology*, 38(5), 539–558.
- Guerrini, S. C. (2002). *The acquisition and assessment of the developing singing voice among elementary students* (Unpublished doctoral dissertation). Temple University, Philadelphia, PA.
- Habibi, A., Ilari, B., Crimi, K., Metke, M., Kaplan, J. T., Joshi, A. A., ...Damasio, H. (2014). An equal start: Absence of group differences in cognitive, social and neural measures prior to music or sports training in children. *Frontiers in Human Neuroscience*, 8, 1–11.

- Hall, C. (2005). Gender and boys' singing in early childhood. *British Journal of Music Education*, 22(1), 5–20.
- Hannon, E. E., & Trainor, L. J. (2007). Music acquisition: effects of enculturation and formal training on development. *Trends in Cognitive Sciences*, 11, 466–472.
- Hargreaves, D. J. (1986). *The developmental psychology of music*. Cambridge, UK: Cambridge University Press.
- Harrison, S. D. (2004). Engaging boys: Overcoming stereotypes – another look at the missing males in vocal programs. *Choral Journal*, 45(2), 24–29.
- Heinrich, J., Heine, S. J., & Norenzayan, A. (2010). *The weirdest people in the world?* (Working Paper Series des Rates für Sozial- und Wirtschaftsdaten, No. 139). Retrieved from <http://hdl.handle.net/10419/43616>
- Hursh, D. (2005). The growth of high-stakes testing in the USA: Accountability, markets and the decline in educational equality. *British Educational Research Journal*, 31(5), 605–622.
- Ilari, B. (2013a). Concerted cultivation and music learning: Global issues and local variations. *Research Studies in Music Education*, 35(2), 179–196.
- Ilari, B. (2013b). Musical cultures of girls in the Brazilian Amazon. In P. S. Campbell & T. Wiggins (Eds.), *The Oxford handbook of children's musical cultures* (pp. 131–146). New York, NY: Oxford University Press.
- Ilari, B., Chen-Hafteck, L., & Crawford, L. (2013). Singing and cultural understanding: A music education perspective. *International Journal of Music Education*, 31(2), 202–216.
- Ilari, B. & Young, S. (in press). (Eds.). *Home musical experiences of children across the world*. Bloomington, IN: Indiana University Press.
- Kirschner, S., & Ilari, B. (2014). Joint drumming in Brazilian and German preschoolers: Cultural differences in synchronization skills, but no prosocial effects. *Journal of Cross-Cultural Psychology*, 45(1), 137–166.
- Kreutzer, N. J. (2001). Music acquisition of children in rural Zimbabwe: A longitudinal observation. *Journal of Research in Childhood Education*, 15(2). Retrieved from <http://www.freepatentsonline.com/article/Journal-Research-in-Childhood-Education/80711097.html>
- Krumhansl, C. L., & Zupnick, J. A. (2013). Cascading reminiscence bumps in popular music. *Psychological Science*, 24(10), 2057–2068.
- Leighton, G., & Lamont, A. (2006). Exploring children's singing development: Do experiences in early schooling help or hinder? *Music Education Research*, 8(3), 311–330.
- Levinowitz, L.M., Barnes, P., Guerrini, S., Clement, M., D'April, P. & Morey, M.J. (1998) Measuring singing voice development in the elementary general music classroom. *Journal of Research in Music Education*, 46, 35–47.
- Levitin, D. (2013). Commentary on “Absolute memory for pitch: A comparative replication of Levitin's 1994 study in six European labs”. *Musicae Scientiae*, 17(3), 350–355.
- Mang, E. (2006). The effects of age, gender, and language on children's singing competency. *British Journal of Music Education*, 23(2), 161–174.
- Marks, M., & Gary, C. L. (2007). *A history of American music education*. Lanham, MD: Rowman & Littlefield.
- Marsh, K. (2011). *The musical playground*. Oxford: Oxford University Press.
- Marsh, K. (1999). Mediated orality: The role of popular music in the changing tradition of children's musical play. *Research Studies in Music Education*, 13(1), 2–12.
- Merriam, A. (1964). *The anthropology of music*. Chicago, IL: Northwestern University Press.
- Mizener, C. P. (1993). Attitudes of children toward singing and choir participation and assessed singing skill. *Journal of Research in Music Education*, 41(3), 233–245.
- Moog, H. (1976). The development of musical experience in children of pre-school age. *Psychology of Music*, 4(1), 38–45.
- Moore, R., Chen, H., & Brotons, M. (2004). Pitch and interval accuracy in echo singing and xylophone playing by 8 and 10 year-old children from England, Spain, Taiwan, & USA. *Bulletin of the Council for Research in Music Education*, 161/162, 173–180.
- Nettl, B. (1992). *The study of ethnomusicology*. Chicago: University of Illinois Press.
- Nix, J. (2012). Commentary: Vocal and choral music. In G. E. McPherson & G. F. Welch (Eds.), *Oxford handbook of music education* (Vol. 1, pp. 551–558). New York, NY: Oxford University Press.

- North, A. & Hargreaves, D.J. (2010). (Eds.). *The social and applied psychology of music*. Oxford: Oxford University Press.
- Pfordresher, P., Brown, S., Meier, K. M., Belyk, M., & Liotti, M. (2010). Imprecise singing is widespread. *Journal of the Acoustical Society of America*, 128(4), 2182–2190.
- Raju, M., & Ross, J. (2012). Adaption to Estonian children of the protocol for cross-cultural research in singing. *TRAMES*, 16(66–67), 125–144.
- Rutkowski, J. (1998). The nature of children's singing voices: Characteristics and assessment. In B. A. Roberts (Ed.), *The phenomenon of singing* (pp. 201–209). St. John's, Canada: Memorial University Press.
- Rutkowski, J. (2015). The relationship between children's use of the singing voice and singing accuracy. *Music Perception*, 32(3), 283–292.
- Rutkowski, J., & Miller, M. S. (2003). A longitudinal study of elementary children's acquisition of their singing voice. *Update: Applications of Research in Music Education*, 22(1), 5–14.
- Rutkowski, J., & Miller, M. S. (1994). The longitudinal effectiveness of individual/small-group singing activities on children's use of singing voice and developmental music aptitude. *Bulletin of Research in Music Education*, 20, 31–43.
- Salvador, K. (2010). How can elementary teachers measure singing voice achievement? A critical review of assessments, 1999–2009. *Update: Applications of Research in Music Education*, 29(1), 40–47.
- Serbun, S.J. & DeBono, K.G. (2010). On appreciating the music of our parents: The role of the parent-child bond. *North American Journal of Psychology*, 12(1), 93–102.
- Siebenaler, D. (2008). Children's attitudes toward singing and song recordings related to gender, ethnicity, and age. *Update: Applications of Research in Music Education*, 27(1), 49–56.
- Stadler Elmer, S. (2011). Human singing: Towards a developmental theory. *Psychomusicology: Music, Mind & Brain*, 21(1 & 2), 13–30.
- Stevens, C. (2012). Music perception and cognition: A review of recent cross-cultural research. *Topics in Cognitive Science*, 4(4), 653–667. doi: 10.1111/j.1756-8765.2012.01215.x
- Tafari, J., & Villa, D. (2002). Musical elements in the vocalizations of infants aged 2–8 months. *British Journal of Music Education*, 19(1), 73–88.
- Trehub, S. E., & Schellenberg, E. G. (1995). Music: Its relevance to infants. *Annals of Child Development*, 11, 1–24.
- Trevarthen, C. (2008). The musical art of infant conversation: Narrating the time of sympathetic experience, without rational interpretation, before words. *Musicae Scientiae*, 12, 15–46.
- Turino, T. (2008). *Music as social life: The politics of participation*. Champaign: University of Illinois Press.
- Valencia, E. (2004). Latinos. In S. Loue, et al. (Eds.), *Encyclopedia of women's health*. Dordrecht, the Netherlands: Springer Science+Business Media.
- Warzecha, M. (2013). Boys' perceptions of singing: A review of literature. *Update: Applications of Research in Music Education*, 32(1), 43–51.
- Welch, G. (2005). Singing and vocal development. In G. McPherson (Ed), *The child as musician* (pp. 311–329). New York, NY: Oxford University Press.
- Welch, G. F., Himonides, E., Saunders, J., Papageorgi, I., Rinta, T., Preti, C., ... Hill, J. (2011). Researching the first year of the National Singing Programme in England: An initial impact evaluation. *Psychomusicology: Music Mind and Brain*, 21(1), 83–97.
- Welch, G. F., Saunders, J., Papageorgi, I., & Himonides, E. (2012). Sex, gender and singing development: Making a positive difference to boys' singing through a national programme in England. In S. D. Harrison, G. F. Welch, & A. Adler (Eds.), *Perspectives on males and singing* (pp. 27–43). Dordrecht, the Netherlands: Springer.
- Welch, G., Sergeant, D., & White, P. J. (1997). Age, sex, and vocal task as factors in singing "in tune": During the first years of schooling. *Bulletin of the Council for Research in Music Education*, 133, 153–160.
- Welch, G. F., Sergeant, D. C., & White, P. J. (1995/1996). The singing competencies of five-year-old developing singers. *Bulletin of the Council for Research in Music Education*, 127, 155–162.



- White, P., Sergeant, D. C., & Welch, G. F. (1996). Some observations on the singing development of five-year-olds. *Early Childhood Development and Care, 118*, 27–34.
- Young, S. (2004). Young children's spontaneous vocalizing: Insights into play and pathways to singing. *International Journal of Early Childhood, 36*(2), 59–74.
- Young, S. (2008). Lullaby light shows: Everyday musical experiences with under-two-year-olds. *International Journal of Music Education, 7*, 115–134.
- Young, S., & Ilari, B. (2012). Musical participation from birth to three: Towards a global perspective. In G. McPherson & G. Welch (Eds.), *Oxford handbook of music education* (pp. 279–295). Oxford, UK: Oxford University Press.