

The longevity of the mature female voice:

Does maintenance of vocal functionality have wider implications for the health and well-being of the singer

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My passion for working with the older voice began many years ago while I was still a working opera singer and a Mum of three small boys. Like most singers, I had a portfolio career which included both teaching and singing. The schedules of my own family made it impossible for me to teach children and so began my journey of working with the older voice. I am fortunate enough to live in Oxford where choirs are plentiful and where singers are keen to improve and sing to the best of their ability. I too was keen to learn. I will always be grateful to BVA for the many excellent courses I was able to attend which inspired my own research journey.

I observed in my voice studio that although science predicted that voices would fail with age, this was not what I was witnessing amongst my students. I wanted to know why. My research began with doing a master's degree in musicology. I was lucky enough to have met Professor Graham Welch whilst doing this and I was able to make my master's dissertation the pilot study for PhD under Graham at UCL.

There was and still is sparse literature on the topic of the ageing voice and especially that written from the perspective of a singer and a musicologist. The time was right for this research as attitudes to older women had changed so much. In past literature the older woman was often portrayed as a witch, associated with ugliness, infertility and wickedness or the poor, degraded, frail grandmother. Older women are now of increasing importance to the vitality and stability of society and the economy. Average life expectancy of a woman is approximately 86 years and women are in a better state of health and are living longer active lives.

My research questions were as follows:

1. What are the components of a healthy voice?
2. How does a healthy voice function?
3. Does the female voice change with age?
 - a. What are the anatomical changes that occur with age?
 - b. What impact to these changes have on:
 - i. The respiratory function
 - ii. The laryngeal function
 - iii. The musculoskeletal system
 - iv. Vocal acoustics and psychoacoustics
4. Can effective training mitigate the effects of ageing?

5. Are there other benefits to the mature female singers to be derived from maintaining the functionality of their voices?

My research methods included a literature review, an experimental study in which singers performed vocal tasks to test their vocal functionality, a questionnaire, volunteers' diaries and my own research log. 54 women all aged over 55 years old took part. 34 were amateur choral singers, 10 were professional singers and 10 were self-proclaimed non-singers. They met on four occasions over six years and on each occasion, they performed tests which I had devised. These examined the singers' agility, breath control, onsets, legato line, vibrato, intonation, pitch range and fundamental frequency.

The literature review predicted that over time the following would occur: the respiratory muscles would weaken leading to a decrease in expiratory flow and lung pressure; the vocal folds would suffer from atrophy, bowing or oedema causing a breathy or creaky sound or hoarseness. The vocal tract calcifies and ossifies over time causing changes to the elasticity of the vocal tract. This can cause changes to both resonance and vibrato. The menopause can bring about many and varying problems such as a loss of the upper register, dryness of the mucosal membrane leading to an increase in phonatory effort and loss of vocal comfort. Muscle atrophy in the tongue can cause loss of motor function and strength, changes to the temporomandibular joint can cause jaw tension and loss of teeth and finally changes to neuromuscular control can lead to changes in stamina and mental function.

Despite this I was inspired by sports science research which suggested that the respiratory function could be improved and that any muscles can be strengthened with exercise.

The findings from my research showed that respiratory function and agility could be improved and maintained over time. Training could improve vocal onset so it was neither forced or breathy. Intonation was largely influenced by early musical training rather than vocal technique. Where the breath control improved vibrato was more controlled, and the rate and regularity of the vibrato was more problematic than the extent. The pitch range did indeed show that the fundamental frequency dropped over time as the literature suggested, but many volunteers retained and even increased their upper pitches. The story behind the data showed that the more proactive the singer was the better their voices coped with the ageing process.

Finally, the stories hidden in the questionnaires and diaries showed how important singing was for maintaining health and wellbeing. Over 82% of the singers in this study reported that they were in a state of good mental health. They said that singing gave them a sense of achievement which improved their sense of identity and self-worth and helped them maintain a positive attitude in other areas of their lives. Singing helped them deal with grief, illness and loneliness. The overarching message from this research is keep singing, stay happy, use it or lose it!

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