

The perceived benefits of singing: findings from preliminary surveys of a university college choral society

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Received 29 August 2000, revised and accepted 9 March 2001

Key words

Choral singing; health benefits; survey

Abstract

Two exploratory studies are reported on the perceived benefits associated with active participation in choral singing. In the first study, 84 members of a university college choral society completed a brief questionnaire that asked whether they had benefited personally from their involvement in the choir and whether there were ways in which participation could benefit their health. A large majority of respondents agreed they had benefited socially (87%) and emotionally (75%), with 58% agreeing they had benefited in some physical way, and 49% spiritually. A content analysis of written comments served to elaborate the ways in which choir members felt they had benefited. Common themes expressed were: meeting new people, feeling more positive, increased control over breathing, feeling more alert and feeling spiritually uplifted. With respect to health benefits, 84% of participants gave answers, the main themes of which related to improved lung function and breathing, improved mood and stress reduction. In the second study, 91 members of the choir completed a structured questionnaire consisting of 32 statements about singing reflecting the ideas expressed in the first study. Over 40% of respondents strongly agreed that 'singing helps to make my mood more positive', 'singing is a moving experience for me sometimes', 'singing makes me feel a lot happier' and 'singing is good for my soul'. A principal components analysis followed by Oblimin rotation identified six dimensions of benefit associated with singing. These were labelled as: benefits for well-being and relaxation, benefits for breathing and posture, social benefits, spiritual benefits, emotional benefits, and benefits for heart and immune system. Cronbach alpha coefficients were satisfactory for all components except the third, social benefits, due primarily to the small number of items loading on this component. Women were significantly more likely to experience benefits for well-being and relaxation, younger people were more likely to report social benefits, and those professing religious beliefs were more likely to experience spiritual benefits. The present studies have a number of limitations, but they provide a useful foundation for future larger scale surveys, more sophisticated qualitative studies, and experimental investigations of the impact of singing on psycho-physiological functioning.

Introduction

Over the last two decades there has been a substantial growth of interest in the UK in the potential contribution of the arts in relation to medicine, healthcare and health promotion. The National Centre for Information on the Arts in Health Care was established in Manchester in 1988, and the same year saw the start of the innovative Arts and Health Programme in Gateshead. More recently, The Nuffield Trust has sponsored major conferences on the arts and health (Philipp *et al.*, 1999; Wyn Owen, 1999; Wyn Owen, 2000) and this year has seen the establishment of the Centre for the Arts and Humanities in Health and Medicine (CAHHM) at the University of Durham, and the setting up of the National Network for the Arts in Health by the King's Fund and a number of other arts and health organisations.

The Health Education Authority, prior to its recent demise, also undertook important work in reviewing "good practice in community based arts projects and interventions which impact on health and well-being" (HEA, 1999), as part of a series of commissioned reports on social capital for health. The newly constituted Health Development Agency is continuing to support work in this field by setting up an Internet database of arts and health projects across the country (www.hda-online.org.uk). In introducing the HEA *Art for Health* report, Gillies (HEA, 1999) makes an important claim, followed by an equally important caveat:

"The arts clearly have a potential to make a major contribution to our health, well-being and life skills. It is important, however, to capture the evidence of the impact of the arts on health to ensure proper recognition of their effect and the availability of appropriate levels of investment to sustain any positive influences."

However, practitioners and researchers working in the arts and health field face a number of fundamental challenges. It is necessary, firstly, to define 'health' clearly; secondly, to characterise the diversity of the arts including their common and specific characteristics, and thirdly, to develop a satisfactory theoretical framework or set of models in order to understand the possible mechanisms through which the arts may benefit health.

With respect to the first point, a number of significant contributions have been made over the last decade to analysing the meaning(s) of health (Cribb and Dines, 1993; Downie and Macnaughton, 2000; Jones, 1997; Ryff and Singer, 1998). These recognise the importance of utilising several key dimensions in characterising health in a positive sense (beyond the mere absence of physical illness and disability), including fitness, personal well-being (mental, emotional, social and spiritual), sense of purpose, empowerment and quality of life. On the second point, the arts are, of course, very diverse and include all forms of the visual arts, music, dance, drama, poetry, literature and any combination of these. Everitt (2000) however, has recently argued that key common themes characterise the meaning of the arts in five arts and health projects currently being evaluated (i.e. creativity, conversation, play, congenial space and emotional literacy) each of which were seen by participants as helping them 'feel good'. Individuals may also position themselves differently in relation to the arts - from hostility or indifference, to interested but relatively passive consumption, to active and enthusiastic involvement - and this would no doubt have a crucial bearing on their personal value with respect to health.

Thirdly, in attempting to theorise the linking mechanisms between the arts and health, a useful starting point is undoubtedly provided by the 'biopsychosocial model of health and illness' (Ogden, 1996). This perspective stresses the key roles played by socio-cultural and psychological factors in affecting health status and individual patterns of coping with illness. Such influences may operate in at least two important ways: first, they may affect the decisions individuals make regarding personal behaviour and lifestyle that over time compromise or promote health; and second, they may interact

directly with physiological processes that lead to negative or positive outcomes for health. The second route is illustrated by the negative impacts of social and personal stressors on health, and by current developments in the field of psychoneuroimmunology that document the significance of psychological factors in relation to immune system functioning (Maier *et al.*, 1994).

In summary, the arts in their diverse manifestations may provide a vehicle through which social and psychological factors exert a beneficial influence, directly or indirectly, on one or more component of health broadly conceived.

Music and health

Of all the arts, music may justly claim to have the greatest significance in relation to health and healing. The idea that music can have significant health benefits has deep historical roots in Western culture (Horden, 2000; Weldin and Eagle, 1991), and is endorsed too within many non-Western cultural traditions (Gouk, 2000). A key landmark in the modern scientific approach to music and its significance for health was the publication in 1948 of *Music and Medicine* edited by Schullian and Schoen. Since that date a considerable body of research has explored the therapeutic use of music for a wide range of physical, neurophysiological and psychosocial problems, as well as the supplementary role of music to alleviate pain and reduce stress and anxiety, in the contexts of medical and surgical procedures (Maranto, 1991). Empirical studies have also investigated the impact of music among healthy individuals on self-reported mood and emotional experience (Hargreaves and North, 1999; Lewis, 1998; Lewis and Hughes, 1997; McCraty *et al.*, 1996; Panksepp, 1995), on measures of cognitive performance and learning (Savan, 1999; Waleson, 2000), and on objective indicators of physiological, neurological and immuno-

logical function (Charnetski *et al.*, 1998; Krumhansl, 1997; McCraty *et al.*, 1996). A striking feature of much of the experimental literature in this field, however, is the focus on passive exposure to brief extracts of music in relatively artificial conditions. Few studies have explored the impact of practical involvement in music making.

Singing and health

An extensive historical literature exists on possible connections between singing and health, and Hunter (1999) has recently reviewed some of this material in a discussion of thirteen articles on the health benefits of singing that appeared between 1891 and 1949 in the American music magazine *The Etude*. These included one by John Harvey Kellogg (the inventor of 'cornflakes') published in 1931, in which he asserted:

"I have been particularly impressed with the value of singing. It is not only a diversion and wholesome mental occupation, and on this account health promoting, but is also excellent lung gymnastics and promotes not alone breathing but the circulation as well. It especially aids circulation through the liver, stomach and other digestive organs, and so promotes digestion" (quoted in Hunter, 1999).

Other contributors pointed to the value of singing for the lungs, breathing problems, depression, headache, stimulating the sympathetic nervous system, general fitness and longevity. Unfortunately, little evidence is to be found in any of these articles to support the claims made.

The view that 'singing is good for you' is currently the cornerstone of a series of singing workshops for adults offered by The Voices Foundation (www.voices.org.uk) - a charitable trust established in 1993 to promote the place of singing in education (Stewart, 1998). The Foundation claims, in its promotional literature, that singing has a wide range of benefits, including improving posture, lifting mood, relieving stress,

Table 1

Perceived benefits associated with choral singing in the first survey (n=84)

Benefits	Agreement	
	n	%
Physically	49	58
Emotionally	63	75
Socially	73	87
Spiritually	41	49

encouraging the release of pain-relieving endorphins, improving circulation, boosting the immune system and exercising respiratory muscles. No research evidence is cited, however, that demonstrates such benefits from singing.

Existing literature

As noted above, very few studies have explored the positive benefits of participation in music making. Indeed, there are many more studies in the performing arts medicine literature that highlight possible harmful consequences of professional engagement in music making. An extensive search for relevant literature has located only six very varied studies on the effects or benefits of active involvement in instrumental music or singing. These are: Schorr-Lesnick *et al* (1985), Rider *et al* (1991), Bygren *et al* (1996), Hills and Argyle (1998a), Hills and Argyle (1998b), and Coffman and Adamek (1999). Given the variation in objectives, sampling and methods used in each of these studies, it is difficult to draw any general conclusions. While there is some indication from the studies of Hills and Argyle and Coffman and Adamek that active participation in music making enhances emotional well-being, the remaining three studies failed to find evidence for tangible physical benefits associated with active involvement in music making and singing.

Objectives of preliminary studies

The current paper reports findings from preliminary studies on the potential health benefits of singing. The work was guided by the World Health Organization (WHO) definition of health as “*a state of complete physical, mental, and social well-being and not simply an absence of disease and infirmity*” (www.who.int). This was further supplemented by a concern to address a notion of ‘spiritual health’ that encompasses a sense of meaning, purpose and transcendence in human experience beyond the purely physical and mundane realities of life.

Given the limited and diverse nature of previous research on the benefits of active participation in music making, it was decided to begin with a simple survey in which members of the choral society in our university college (Canterbury Christ Church University College) (directed by the second

author) were asked to write about the benefits they believed they experienced from participating in a large choir. The results from this initial survey were then used as the basis for a structured questionnaire to investigate more systematically singers’ perceptions of the benefits arising from active participation.

It should be stressed that the studies reported below were primarily qualitative and exploratory, and did not attempt to obtain data from a representative sample of a wider population of choristers. For these reasons, it is necessary to be very cautious in the use of statistical procedures and to recognise that the findings may not be generalisable beyond the sample studied. Nevertheless, we argue that these surveys represent an important contribution to an under-researched area, and provide a valuable stimulus to the development of further research.

Initial qualitative exploration

Method

Questionnaire

For the purposes of this initial qualitative exploration, a simple questionnaire was designed consisting mainly of open-ended questions about singers’ experiences during rehearsals and the benefits they believed they gained from participation in the choir. The focus here is on the answers given to the following questions:

- Do you feel you have benefited personally in the following ways (four areas were specified - physically, emotionally, socially, spiritually) from being involved in this choir so far? If ‘yes’ please explain how.
- Are there any ways in which you think that participating in this choir could be ‘good for your health’?

It is recognised that there may be some overlap between the different aspects of these questions. For example, it is likely that anyone recognising health benefits from singing would also identify benefits of a physical and perhaps emotional nature. Nevertheless, an open-ended approach with such overlaps was in line with the WHO definition of health and was considered appropriate for an exploratory study.

Procedure and sample

The university college choral society meets once a week for two hours between 7.00 and 9.00 pm on Wednesday evenings. Its membership consists mainly of undergraduate students together with some members of staff and people from the surrounding community. During the academic year 1999-2000 the main works being prepared for performance were Vivaldi’s *Gloria* and Rutter’s *Requiem*. At an early point in a rehearsal at the beginning of December 1999 the authors gave a brief explanation of the purpose of the survey they wished to carry out. Approximately halfway through the evening, the questionnaire was distributed for choir members to complete. The procedure of distributing, completing and gathering in questionnaires took approximately 15 minutes. In total, 84 singers completed the questionnaire (information on sex and age was not requested) which represented approximately 85% of the choir’s membership as not all members were in attendance.

Analysis

A content analysis was undertaken by reading through the comments for each of the questions noted above and identifying distinct themes or issues. Care was taken to stick closely to the language used by respondents and to construct categories that would avoid the possibility of inappropriate interpretation. A count was then made of the number of singers referring to each of these themes/issues in their comments.

Results

Benefits from being in the choir

Singers were asked to say ‘yes’ or ‘no’ in relation to four areas of possible benefit, and to give further explanation for each ‘yes’ answer. In most cases, respondents gave a clear indication of ‘yes’ and ‘no’ but some omitted circling or ticking an answer and left the comment box blank. Such ‘non-responses’ were regarded as ‘no’ answers. One singer ticked exactly between ‘yes’ and ‘no’ for ‘emotionally’ and another circled both ‘yes’ and ‘no’ for ‘spiritually’. These answers were regarded as not definitely ‘yes’ answers and were combined with the ‘no’ responses.

Table 1 reports the number and percentage of singers in the total sample of 84 giving ‘yes’ answers to each of the four areas specified. Percentages need to be treated with caution as the sample size is less than

100, but the results show clearly that a large majority of choir members believe they have benefited socially (87%) and emotionally (75%) from the experience of being in the choir. Just over half believe they have benefited physically (58%), and just under

half feel some spiritual benefit (49%).

Comments on benefits from being involved in the choir

Where respondents indicated that they perceived a certain kind of benefit, they were asked to explain further. The main themes

emerging in these comments were identified and the frequency and percentage incidence of each kind of comment are reported in Table 2. Percentages are based on the number of people giving comments. For 'spiritual benefits,' three people who answered 'no' or left the yes/no option unanswered, nevertheless gave comments to explain their views, e.g. "I don't think that I can define my feelings spiritually. I don't classify things that way".

Ways in which participation in the choir is good for health

Of 84 participants, 74 gave an answer to the question about health benefits. The main themes emerging were identified and the incidence of each category determined. The findings reported in Table 3 show that the most common benefits identified were 'improves lung function' (41%), 'improves mood' (30%) and 'combats stress' (22%).

Discussion

Prior to undertaking this simple exploratory study, no specific expectations were held regarding the kinds of comments that would be made, and the study was undoubtedly illuminating and served its purpose in providing guidance for producing a structured questionnaire to undertake a more systematic survey.

A majority of respondents agreed that singing in the choir had brought them social and emotional benefits and approximately half believed they had experienced physical and spiritual benefits too. It is of interest that 30% of those identifying spiritual benefits used words and phrases commonly used in describing emotional benefits, whereas other comments had a specifically spiritual or religious meaning.

Many respondents were also able to suggest ways in which singing could be good for health. The most common responses related to lung function and breathing, with 41% referring to improvements in lung function, breathing or voice box. References to breathing and lung function were also the most common responses to the question on physical benefits (Table 2). These findings suggest that some respondents believed what Schorr-Lesnick *et al* (1985) refer to as the 'myth' of improved lung capacity among singers. However, many of the comments made by participants in this study refer to increased control over breathing in the act of singing which is unlikely to be reflected in measures of lung

Table 2

Perceived benefits of choral singing: themes expressed in the first survey

	n	%
Physical benefits (n=45)		
Increased control over breathing/improves breathing	20	44
Wakes me up/feel more alert/energised/active	9	20
Improved posture/improved stance	8	18
Exercises lungs/improved lung capacity	6	13
Exercises, strengthens diaphragm	4	9
Feel fitter, stronger, better	4	9
Improved voice/able to project voice better when I sing	4	9
Exercises abdominal and chest muscles	2	4
Strengthens cardiovascular system/exercises heart	2	4
Helps with breathing difficulties/asthma	2	4
Emotional benefits (n=59)		
Makes me feel really positive/feel good/feel happier/raises my mood	36	61
Emotional workout/induces emotions	7	12
Helps to release stress/reduce stress/less tension	7	12
More relaxed/calmer	6	10
Energized, active, enthusiastic, refreshed	4	7
Diversionsary, mental immersion, helps me to forget work	3	5
Feels very therapeutic	2	3
Expresses own emotions	2	3
Improves self-confidence	2	3
Social benefits (n=72)		
Have got to meet/know more people through singing	46	64
Have made new friends	13	18
Enjoy meeting friends I had before joining the choir	6	8
Good rapport/fun/good atmosphere/friendly	5	7
Socialise with people in the choir afterwards in the pub	5	7
Unifying experience/feel part of a group	4	6
Spiritual benefits (n=37)		
Miscellaneous: feel more positive about life, therapeutic, in harmony, happier, less stressed, connected, worthwhile, contributes to society	11	30
Spiritually uplifting	10	27
Not sure what you mean/don't think in these terms	5	14
Singing has intangible effects/can't describe or explain	3	8
Singing religious music enhances my own spiritual/religious beliefs	2	5
Singing makes you think about religion, history, culture	2	5
Feel affected by singing in harmony	2	5
Singing refreshes/lifts the soul	2	5
Feel a bond with other members of the choir	2	5

n=number of respondents providing comments

Benefits of singing

capacity, such as 'forced expiratory volume' utilised in the Schorr-Lesnack *et al* study. Interestingly, two members of the choir reported that their problems with breathing or asthma were improved by singing which is consistent with some previous research on the benefits for asthmatics of playing wind instruments (Lucia, 1994).

A further 30% of respondents answering the question on health benefits refer to psychological improvements in mood, happiness, etc, and 22% mention the value of singing in reducing stress. These results are in line with Coffman and Adamek (1999) who found that 28% of comments given by senior wind band players mentioned enhancement of 'emotional well-being' by participation in the band.

While the categorisation of singers' comments is useful in identifying patterns, this approach to analysis cannot capture the variety and subtlety of the points made by some respondents. In commenting on how singing might be good for health, for example, a number of participants attempted to give explanatory accounts of how music might be beneficial. For example:

"It's good for one's soul and what's good for your soul is good for your body."

"If your physical side is related to your spiritual side, then it can do only good. Healthy mind, healthy body, etc."

"To experience emotional well-being is (must be!) very good for health. Music is a natural thing for humans."

Further work, exploring such ideas in greater depth using focus group methods and interviews would be of considerable interest.

Second survey

Method

Questionnaire

The questionnaire used in the second survey was constructed using the results emerging from the initial study. Thirty-two statements were written to represent the main themes regarding physical, emotional, social and spiritual benefits and effects on health, using wherever possible words and phrases used by choir members themselves (e.g. 'singing helps to increase my lung capacity', 'singing helps me to relax' and 'singing improves my mental well-being'). The only exceptions to this general rule were two statements relating to immune system function (i.e. 'singing helps to stimulate my immune system' and 'singing helps me to avoid colds and flu'). These were included on the basis of recent studies that indicate that listening to music can have beneficial effects of the workings of the immune system (Charnetski *et al*, 1998; McCraty *et al*, 1996; Rider *et al*, 1991). It is acknowledged that reference to 'the immune system' is somewhat technical and that choir members might find it difficult to judge such a statement. For this reason, an additional concrete item referring to 'avoiding colds and flu' was included. Respondents were asked to indicate their level of agreement with the statements on a five-point scale running from 'strongly agree' to 'strongly disagree'.

A number of questions were also included to gather information on additional variables including sex, age and religious belief.

Sample and procedure

All members of the choral society attending a rehearsal in late January 2000 were asked to complete the questionnaire during a short interval halfway through the evening. The procedure took approximately 15 minutes and a total of 91 completed questionnaires were returned (74 females and 16 males, one did not give their sex; ages ranged from 18 to 69, with just over half of the sample aged 18-19 years, and 45% considered themselves to be 'religious'). Not all members of the choir attended on the evening in question, and the sample achieved represents approximately 90% of the choir's membership.

Analysis

Given the non-random nature, size and characteristics of the sample, it was considered appropriate to examine the pattern of responses for the whole group (using frequency distributions followed by principal components analysis) rather than analyse responses to individual items by variables such as sex or age group. Limited subgroup comparisons were then made using independent t-tests on composite scores derived from the factor analysis.

Results

Table 4 reports the frequency distributions of responses to statements regarding singing and its benefits (ordered on the basis of the percentage of 'strongly agree' responses; n varies due to missing values). The statement 'singing helps to make my mood more positive' produced the highest level of strong agreement (52%), while 'singing helps me to avoid colds and flu' produced the lowest level of strong agreement (7%).

In order to explore the pattern of relationships among the items, responses were subject to principal components analysis. Six components with Eigen values greater than one were extracted accounting for 69% of the total variance and these were subject initially to a Varimax orthogonal rotation. When loadings equal to or greater than ± 0.3 were considered, a fairly clear pattern emerged although a strong simple structure was not achieved as 19 of the 32 statements loaded on more than one component. It was decided, therefore, to perform an oblique rotation to the Oblimin criterion.

Table 3

Perceived health benefits of choral singing: themes expressed in the first survey (n=74)

Ways in which singing is 'good for health'	n	%
Improved lung functioning, breathing, voice box	30	41
Improves mood, feelings of happiness, feeling good, increased well-being, good psychologically	22	30
Combats stress/reduces stress	16	22
Good for whole body, improves general fitness	7	9
Diaphragm exercised	6	8
Heart exercised	5	7
Encourages relaxation, has calming effect	5	7
Good for the spirit, good for the soul	5	7
Social benefits, meeting new people, developing friendships	5	7
Posture improved	4	5

The pattern matrix for the Oblimin solution is reported in Table 5 (loadings of less than ± 0.3 are omitted and sample size is reduced to 75 due to listwise deletion of cases with missing values). The six rotated components were readily interpretable and were labelled as follows:

- Benefits for well-being and relaxation
- Benefits for breathing and posture
- Social benefits
- Spiritual benefits
- Emotional benefits
- Benefits for heart and immune system

Components showed modest inter-correlations, with the largest values between

component one 'well-being and relaxation' and components five 'emotional benefits' (0.50) and four 'spiritual benefits' (-0.42).

The internal consistencies of the six components were estimated using Cronbach's alpha based on the items with loadings greater than ± 0.4 . Values were highly satisfactory for all components with the exception of component three (social benefits) which had only three defining items: benefits for well-being and relaxation ($\alpha=0.94$), benefits for breathing and posture ($\alpha=0.77$), social benefits ($\alpha=0.55$), spiritual benefits ($\alpha=0.88$), emotional benefits ($\alpha=0.88$) and benefits for heart and immune system ($\alpha=0.81$).

Given the clarity of the results from the

principal components analysis and the generally high alpha values, it was considered worthwhile to compute factor scores (regression method) and make comparisons between the following sub-groups within the choir: females vs. males; younger (18-19 years old) vs. older (20-plus years of age) members, and religious vs. non-religious members. Independent t-tests were used to make comparisons. Two-tailed tests with $p \leq 0.01$ were adopted for rejecting the null hypothesis of no difference between the groups compared. This level of stringency was considered appropriate given the nature and size of the sample, and the exploratory nature of the investigation. Three significant differences emerged: women were more likely to report benefits for well-being and relaxation than men ($t=-4.45$, $df=75$, $p < 0.001$); younger members of the choir were more likely than older members to report social benefits ($t=-2.53$, $df=75$, $p < 0.01$), and religious members were more likely than non-religious members to report spiritual benefits ($t=6.24$, $df=68$, $p < 0.001$).

Discussion

Many of the statements elicited high levels of agreement (strongly agree and agree combined). This was especially true of items that related to the emotional or affective impact of singing. As the results in Table 4 indicate, no fewer than 93% of respondents agreed that singing helps to make their mood more positive, 89% reported feeling happier, 71% felt it improves their mental well-being, and 64% felt it gives them a more positive attitude. Singing was generally seen to be beneficial in terms of relaxation and stress reduction: 80% agreed that singing helps them to relax, 79% felt it helps to reduce stress, 66% to forget worries and 78% to feel calmer.

Singing was widely perceived as emotionally arousing and providing opportunities for emotional expression. It was also commonly experienced as energizing. No fewer than 80% found singing 'a moving experience', 63% reported 'tingling feelings in my body', 64% felt 'I can really let myself go when singing', 74% agreed they feel 'more energetic' and 76% felt it helps them feel 'more awake and alert'. The 63% figure for tingling feelings is close to the 68% incidence of peak experiences while listening to music reported by Lewis (1998).

Items on possible spiritual dimensions of

Table 4

Perceived benefits of choral singing: percentage frequency distribution of responses in the second survey - rank ordered by strongly agree responses

	n	Strongly agree	Agree	Unsure	Disagree	Strongly disagree
Mood positive	91	52	41	6	2	-
Moving experience	91	46	34	14	4	1
Feel happier	91	44	45	9	2	-
Good for my soul	89	42	32	20	7	-
Achievement	91	39	36	21	3	1
Helps relax	91	37	43	13	6	1
Stimulate adrenalin	91	35	42	15	6	2
Look forward to	90	34	44	14	6	1
Lung capacity	91	33	50	17	1	-
Mental well-being	90	32	39	23	4	1
Improve breathing	91	30	54	15	1	-
Reduce stress	90	29	50	14	7	-
Forget worries	91	29	37	18	10	7
Feel calmer	91	28	50	18	3	2
Let myself go	91	28	36	22	12	2
Tingling feelings	89	26	37	18	14	6
More energetic	91	26	48	15	8	2
Improve posture	90	24	44	20	10	1
Positive attitude	90	22	42	27	8	1
New friends	90	21	54	11	13	1
Bond with choir	88	21	52	21	7	-
Socialise after	88	21	43	13	16	8
Awake and alert	91	20	56	17	6	2
Spiritually uplifted	91	20	33	28	13	7
Exercise heart	90	19	39	40	2	-
Spiritual side	90	19	28	31	14	8
Strengthens diaphragm	90	18	54	26	2	-
Closer to God	91	18	22	21	22	18
Increases oxygen	91	17	37	43	3	-
Broaden outlook	91	15	39	33	11	2
Stimulate immune system	90	9	11	52	27	1
Avoid colds	91	7	7	50	28	10

Benefits of singing

choral singing elicited a wider spectrum of responses. Just over half of respondents (53%) agreed that singing gives them a feeling of being 'spiritually uplifted', 47% agreed that singing helps to reinforce 'my belief in a spiritual side to life', and 40% agreed that singing 'helps me feel closer to God'. Interestingly, however, 74% of respondents agreed that singing is 'good for my soul' and only 7% disagreed with this statement. Clearly, references to 'the soul'

were interpreted differently from references to 'the spirit'.

With respect to items referring to physical effects and benefits of singing, responses varied according to the specific aspects of bodily functioning identified. Some items elicited fairly widespread agreement (e.g. stimulates adrenalin 77%, increases lung capacity 83%, strengthens diaphragm 72%, improves posture 68%) whereas others elicited more 'unsure' responses or disagree-

ment (e.g. exercise heart 40% unsure, increases oxygen in blood 43% unsure, stimulate immune system 52% unsure and 28% disagree, avoid colds and flu 50% unsure and 38% disagree). It is interesting that levels of agreement with the immune system items were so low as no respondent in the exploratory survey spontaneously mentioned this as a possible benefit. As noted earlier, these items were included on the basis of previous research that indicates that listening to music can stimulate immune system functioning (Charnetski *et al.*, 1998; McCraty *et al.*, 1996; Rider *et al.*, 1991), although Rider *et al.* (1991) found that sIgA levels were lower after singing than after passively listening to music.

The outcome from the principal components analysis followed by oblique rotation produced a strong simple structure, with few items loading above ± 0.3 on more than one component. Components one, four and five are the most strongly inter-correlated indicating that experiences of well-being are linked with perceptions of emotional and spiritual benefit.

The first component, 'well-being and relaxation' had loadings from thirteen items, most of which refer to subjective experiences of singing. As we saw above, most members of the choir agreed with many of these statements, though some more strongly than others. A minority, however, were either unsure or actually disagreed with them. The Cronbach alpha value for this component was very high which indicates a strong degree of consistency in the way respondents answered this set of statements.

The second component is defined primarily by items related to breathing and lung function. In addition, an item referring to improvements in posture loads on this component, indicating that respondents tend to associate standing up straight with improvements in breathing. The small loading from the heart exercise item makes sense given that increased frequency and depth of respiration will increase heart rate. The third component is defined by three items related to the social dimensions of being in the choir. Clearly, the social dimensions of participation in the choir are more significant to some members than to others. It is of interest that this component has a small negative loading from 'helps me forget any worries I

Table 5

Perceived benefits of choral singing: six components emerging from the second survey (Oblimin rotation, loadings $\geq \pm 0.3$; n=78)

	1	2	3	4	5	6
Well-being and relaxation						
Mood positive	88					
Look forward to	80					
Helps relax	78					
Mental well-being	77					
Feel happier	76					
Feel calmer	70					
Reduce stress	67					
Awake and alert	67					
Positive attitude	63					
Forget worries	62		-42			
Achievement	55					
Energetic	48		39			
Let myself go	36				36	
Breathing and posture						
Lung capacity		77				
Improve breathing		74				
Strengthens diaphragm		66				
Improve posture		60				
Social benefits						
Socialise after rehearsals			70			
Bond with choir			51			
New friends		40	51			
Spiritual benefits						
Spiritual side of life				-75	34	
Spiritually uplifted				-71		
Closer to God				-71		
Broaden outlook				-46		
Emotional benefits						
Stimulate adrenalin					80	
Moving experience					75	
Tingling feelings					66	
Good for my soul					49	
Heart and immune system						
Increases oxygen						82
Stimulate immune system				-38		66
Exercise heart		40				65
Avoid colds				-37		61

might have' which suggests that members of the choir who socialise little find this more difficult. The fourth component is strongly defined by the three items that make explicit reference to spirituality or belief in God, reflecting substantial consistency in the responses given to these items.

The fifth component labelled 'emotional significance' is perhaps the most interesting as it brings together such an apparently disparate set of items: 'stimulates a flow of adrenalin', 'a moving experience for me', 'tingling feelings in my body' and 'good for my soul'. Small loadings are also apparent for the two immune system items. This component deserves to be explored further in discussion with singers to elucidate possible connections among these different aspects of their experience and beliefs. Is the experience of tingling, for instance, a prime criterion for judging an experience to be moving, or do tingling feelings arise as a result of music being interpreted as moving? Is the experience of tingling understood as due to increased flow of adrenalin? Is the experience of adrenalin flow and of tingling taken to be a sign that singing is good for the soul? Are the physical and emotional processes referred to believed to stimulate the immune system? Clearly there are many ways in which the links identified in this component might be understood and further work is required to explore these possible interpretations.

Finally, the sixth component brings together the items concerned with the heart, oxygen levels in the blood and the immune system. This grouping may reflect the fact that these four items show the highest levels of unsure responses of the all items in the questionnaire.

The components identified are also close to those reported by Hills and Argyle's (1998a) study of music group members using a musical experience scale. The first factor in their study related to experiences of 'well-being'; the second and fourth respectively related to religious/mystical experiences, and the third factors in each study related to 'social benefits.' Given the different samples and use of different instruments, this degree of overlap is striking and mutually validating.

Further support for the meaningfulness of the present results is gained from two sources. Firstly, the high Cronbach alpha

coefficients obtained for five of the six components identified. This indicates a substantial degree of internal consistency in the way participants responded to the items in the questionnaire. And secondly, the significant differences that emerge from the sub-group comparisons based on factors scores. It is to be expected that individuals with religious beliefs would be more likely to endorse statements about the spiritual dimensions of singing, and this pattern was clearly apparent in the data. Similarly, it is not surprising to find that younger members of the choir were more likely to agree that membership brought social benefits (especially meeting with friends for a drink in a local bar after rehearsals!). The marked difference between men and women with respect to 'well-being and relaxation' also points to a significant gender dimension to the experience of singing in a choir, with women more likely to report greater benefits.

Limitations and further research

The studies reported in this paper were exploratory and provisional and involved a moderately sized convenience sample of members of one choir, most of whom were females in their late teens and early twenties. It is not possible, therefore, to generalise the findings beyond the group investigated. Nevertheless, to the authors' knowledge, these studies represent the first attempt of its kind to investigate the potential health implications of active participation in choral singing, and as such provide a valuable basis for further studies that are larger in scale and more probing. It would be of interest, for instance, to gather similar data from members of several choirs that differ in their membership and repertoire to determine whether the results reported here are robust.

It would also be of considerable interest to explore the experiences and beliefs of singers in greater detail using appropriate qualitative techniques of data gathering and analysis. The authors have undertaken a number of focus group discussions with members of the choral society to explore some of the issues raised by these initial studies. These discussions have been fascinating and further work in this direction is planned.

It is important to re-state that the findings obtained from these studies relate to perceived benefits that singers associate with active participation in the choral soci-

ety. Many of the statements included in the questionnaire relate to subjective experiences or states. No fewer than 89% of respondents claimed to 'feel happier' as a result of singing, for example. Such reports have to be taken at face value and it is difficult to envisage ways in which 'objective' data could show that someone was mistaken when they report feeling happier! Where further development would be possible however, is to explore whether degrees of happiness (or positive mood, mental well-being, etc) can be reliably assessed, and whether choir members tend to be happier on evenings when they sing than on evenings when they do not. It might also be of interest to investigate the factors or mechanisms accounting for increased happiness. Is greater happiness due, for example, to singing per se, the general atmosphere of application and humour during rehearsals, or to the experience of collective activity and socialising with others? Hills and Argyle (1998a; 1998b) report some data relevant to this question using the Oxford Happiness Scale and further research with this instrument would be of interest.

One possible problem with the questionnaire used in the second study is the emphasis on positive effects associated with singing, and the lack of counterbalancing negative statements. This may have encouraged a general positive response bias reflected not only in the high level of 'agree' responses, but also the strong initial evaluative dimension emerging from the principal components analysis and the correlations between components one, four and five (all of which are clearly 'subjective' in character). Given that participation in the choral society is a voluntary activity and reflects a definite interest in music, it may be that a high personal value placed on music encouraged participants to agree indiscriminately with any positive sounding statement. In countering this argument, however, it can be pointed out that most items on the questionnaire produced a range of responses and for some the balance was on the 'disagree' side of the scale. And interestingly, two items on immune functioning, which clearly identify possible positive outcomes from singing, produced 'unsure' or 'disagree' responses from a majority of respondents. In addition, the principal components analysis provides evidence of internal con-

sistency in responses to items according to their meaning. It appears unlikely, therefore, that participants in the second study responded to the items in an unthinking manner guided only by a generally positive attitude towards music.

In contrast to statements related to subjective state, a number of statements in the second questionnaire relate to aspects of the body (heart function, lung capacity, muscle tone and immune system function), and such functions could be directly and objectively assessed to determine whether singing does, in fact, result in changes that may carry physical health benefits. While the evidence reported by Schorr-Lesnicks *et al* (1985) casts doubt on the notion that singing improves lung capacity, other studies have demonstrated that even passive exposure to music for short periods of time can have statistically significant effects on a variety of physiological parameters that may have health implications. The most interesting findings in this regard undoubtedly relate to immune system functioning. Further experimental research, following the work of Rider *et al* (1991), McCraty *et al* (1996) and Charnetski *et al* (1998), is currently being planned by the authors to explore further the effects of singing on levels of salivary immunoglobulin A.

This paper began by noting the recent development of interest in the UK in the potential contributions that the arts can make to health. Health in this context refers not just to an absence of physical illness, but to a broader conception encompassing notions of physical, psychological, social and spiritual well-being. However, as Gillies (HEA, 1999) notes, progress in this field requires that research and evaluation be carried out "to capture the evidence of the impact of the arts on health". We hope that this study makes a small contribution to this ambitious enterprise, and serves to encourage further investigations into the potential benefits that singing may hold for health.

Acknowledgements

The authors wish to thank all members of the university college choral society for their participation in these studies, and to Professor Susan Holmes and Dr Sally Robinson (Canterbury Christ Church University College) and Professor George Smeaton (University of Wisconsin-Stout) for their constructive criticisms of an earlier draft of this

paper. Thanks are also extended to two anonymous reviewers of this paper for their thought-provoking comments.

This research was supported by a grant from Canterbury Christ Church University College.

References

- BYGREN L O, KONLAAN B B and JOHANSSON S-E (1996). Attendance at cultural events, reading books or periodicals, and making music or singing in a choir as determinants for survival: Swedish interview survey of living conditions. *BMJ*; 313, 1577-1580
- CHARNETSKI C J, BRENNAN F X and HARRISON J F (1998). Effect of music and auditory stimuli on secretory immunoglobulin A (IgA). *Percept Mot Skills*; 87, 1163-1170
- COFFMAN D D and ADAMEK M S (1999). The contribution of wind band participation to quality of life. *Mus Ther Persp*; 17(1), 27-31
- CRIBB A and DINES A (1993). What is Health? In: *Health Promotion: Concepts and Practice*. (Edited by Dines A and Cribb A.) London: Blackwell
- DOWNIE R S and MACNAUGHTON J (2000). *Clinical Judgement: Evidence in Practice*. Oxford: University of Oxford Press
- EVERITT A (2000). Evaluation. Paper presented at CAHHM Launch Conference, University of Durham, UK, 14 June 2000
- GOUK P (EDITOR) (2000). *Musical Healing in Cultural Contexts*. Aldershot: Ashgate
- HARGREAVES D J and NORTH A C (1999). The functions of music in everyday life: redefining the social in music psychology. *Psych Mus*; 27(1), 84-95
- HEA (HEALTH EDUCATION AUTHORITY) (1999). *Art for Health: Summary Bulletin*. London: Health Education Authority
- HILLS P and ARGYLE M (1998a). Musical and religious experiences and their relationship to happiness. *Pers Individ Diff*; 25, 91-102
- HILLS P and ARGYLE M (1998b). Positive moods derived from leisure and their relationship to happiness and personality. *Pers Individ Diff*; 25, 523-538
- HORDEN P (EDITOR) (2000). *Music as Medicine: A History of Music Therapy Since Antiquity*. Aldershot: Ashgate
- HUNTER B C (1999). Singing as a therapeutic agent, in *The Etude*, 1891-1949. *J Mus Ther*; 36(2), 125-143
- JONES L (1997). What is Health? In: *Promoting Health: Knowledge and Practice*. (Edited by Katz J and Peberdy A.) London: MacMillan/Open University
- KRUMHANS L C L (1997). An exploratory study of musical emotions and psychophysiology. *Can J Exp Psychol*; 51(4), 336-352
- LOWIS M J (1998). Music and peak experiences: an empirical study. *Mankind Q*; 39(2), 203-224
- LOWIS M J and HUGHES J (1997). A comparison of the effects of sacred and secular music on elderly people. *J Psychol*; 13(1), 45-55
- LUCIA R (1994). Effects of playing a musical wind

instrument in asthmatic teenagers. *J Asthma*; 31(5), 375-385

MAIER S F, WATKINS L R and FLESHNER M (1994). Psychoneuroimmunology: the interface between behaviour, brain and immunity. *Am Psychol*; 49, 235-254

MARANTO C D (EDITOR) (1991). *Applications of Music to Medicine*. Washington: National Association for Music Therapy

MCCRATY R, ATKINSON M, REIN G and WATKINS A D (1996). Music enhances the effect of positive emotional states on salivary IgA. *Stress Med*; 12, 167-175

OGDEN J (1996). *Health Psychology: A Textbook*. Buckingham: Open University Press

PANKSEPP J (1995). The emotional sources of "chills" induced by music. *Mus Percep*; 13(2), 171-207

PHILIPP R, BAUM M, MAWSON A and CALMAN K (EDITORS) (1999). *Humanities in Medicine: Beyond the Millennium*. London: The Nuffield Trust

RIDER M, MICKEY C, WELDIN C and HAWKINSON R (1991). The effect of Toning, Listening and Singing on Psychophysiological Responses. In: *Applications of Music in Medicine*. (Edited by Maranto C D) Washington: The National Association for Music Therapy

RYFF C D and SINGER B (1998). The contours of positive human health. *Psychol Inq*; 9(1), 1-28

SAVAN A (1999). The effect of background music on learning. *Psychol Mus*; 27(2), 138-146

SCHORR-LESNICK B, TEIRSTENIN A S, BROWN L K and MILLER A (1985). Pulmonary function in singers and wind-instrument players. *Chest*; 88(2), 201-205

SCHULLIAN D and SCHOEN M (EDITORS) (1948). *Music and Medicine*. New York: Henry Schuman

STEWART A (1998). Sure foundation. *Classical Mus*; 6 June 1998, 12-13

WALESON H (2000). When two US scientists published their research on the connection between music and cognitive skills, the media rejoiced. "Music makes you smarter!" they cried. But is it true? *BBC Music Magazine*, June 2000, 26-29

WELDIN C and EAGLE C (1991). An Historical Overview of Music and Medicine. In: *Applications of Music in Medicine*. (Edited by Maranto C D) Washington: The National Association for Music Therapy

WYN OWEN J (1999). *Arts, Health and Well-being: A Third Way for Health*. Nuffield Trust Statement No. 9. London: The Nuffield Trust

WYN OWEN J (2000). *Arts, Health and Well-being: A Third Way for Health*. Paper presented at *The Healing Arts: The Role of The Humanities in Medical Education*. Royal Society of Arts, London, 30 March 2000