

The Value of Group Singing

Preliminary insights from a phenomenological approach to understanding a complex cultural activity

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Abstract

Group singing is a feature of all human society, facilitating individual wellbeing as well as group cohesion and interpersonal trust and empathy (Clift, 2013). It is one of the most accessible forms of music-making, and its complex benefits are widely accepted and increasingly used to assist in the maintenance and recovery of individual health and wellbeing, although a critical understanding of the mechanisms underpinning such benefits is still in its infancy (Clift, 2013; Fancourt et al., 2016; Hallam, 2015; Livesey, Morrison, Clift, & Camic, 2012).

Responding to the call for greater rigour in articulating the value of arts and culture to people and society whilst recognizing, “the imperative to reposition first-hand, individual experience of arts and culture at the heart of enquiry into cultural value” (Crossick & Kaszynska, 2016), Distributed Ethnography provides a ‘qualiquant’ methodology for building understanding of group singing, grounded in phenomenology yet able to identify trends and patterns of experience beyond that of the individual.

An emergent hypothesis from the current study is that musical entrainment and interpersonal neurobiological ‘resonance’ are sympathetically entangled, and that participants in group singing activities are able to recognise this phenomenon when it occurs, as contributing to the wellbeing effects of the activity.

Furthermore, the use of methodologies such as Distributed Ethnography suggests that research into the complex benefits of cultural participation can be undertaken more rigorously without discounting the ‘centrality of experience’ (Crossick & Kaszynska, 2016, p. 21) or interfering with it unduly, thus leading to a more robust and critical understanding of the value of arts and culture to people and society.

Singing: What is it Good For?

To explain why a phenomenological approach is necessary to understanding the various benefits of group singing, I must first say more about the complex nature of the activity, and why quantitative data alone may be insufficient to fully understand it. In much of the research into group singing, the social dimension is emphasised (Livesey et al., 2012; Welch, Himonides, Saunders, Papageorgi, & Sarazin, 2014), even though what may be assumed can be measured about the activity is the benefit on the individual in terms of their wellbeing (Clift, 2013; Clift, Manship, & Stephens, 2017; Shakespeare & Whieldon, 2017) or physical health, particularly in relation to respiratory function and treatment of Parkinson’s Disease (BBC Health Check, n.d.; Clift et al., 2013; Gunter Kreutz, Bongard, Rohrman, Hodapp, & Grebe, 2004; Gunther Kreutz et al., 2003; Morrison & Clift, 2013; Skingley, Clift, Coulton, & Rodriguez, 2011).

The tension inherent in using individual outcomes to measure the effect of social phenomena raises some interesting epistemological challenges, not least of which is the validity of inferring the one from the other. The unit of analysis is chiefly the individual, even when the phenomenon in its natural state is inherently social.

Moreover,

‘Most qualitative studies offer a convincing story that group singing can be beneficial for psychological and social wellbeing. But robust objective evidence on the value of singing for physical wellbeing is virtually non-existent, even in relation to lung function, where intuitively, singing might be expected to show benefits.’ (Clift, 2013)

Understanding the individual physical and psychological benefits of group singing is important, but it is not the whole story. And collecting ‘convincing stories’ about group singing is worthwhile, but is in itself insufficient in helping to understand where group singing might have particular generalisable and reproducible benefits.

Some more recent studies deploy measures such as measuring oxytocin levels within individuals pre- and post-singing (Bernatzky, Strickner, Michaela, Franz, & Kullich, 2013; Fancourt et al., 2016; Gunther Kreutz, Quiroga Murcia, & Bongard, 2013; D. J. Levitin, 2008; D. Levitin, Mallik, & Chanda, 2017), which provide a good inferential link to the affordance for social bonding which group singing provides, yet it is still an *Intra*-personal measure rather than an *inter*-personal one. Taken on their own, such approaches potentially risk reducing the rich interpersonal complexity of group singing to only that which can be measured within the individual, thereby potentially missing the essence of what lies at the heart of the activity, namely the co-construction of a social reality through music, binding each individual to the other individuals, to the whole group, and often with those listening.

Therefore, while the individual physical and psychological benefits of group singing are becoming more clearly understood, the contradiction remains in developing a largely *intra*-personal understanding of an *inter*-personal phenomenon. In other words, *intra*-personal measures – while being necessary to an understanding of the impact of group singing on its participants – are perhaps insufficient in capturing the full impact of the activity. As the AHRC Cultural Value project suggests, reporting on the findings of the University of Pennsylvania’s Social Impact of the Arts Project (SIAP):

‘By focusing on the individual we [may] have been working with the wrong unit of analysis. While we have growing evidence that individuals are changed through encounters with the arts, it could be that the full effect of arts cultural engagement can be captured only if one accounts for the relational and collective changes.’ (Crossick & Kaszynska, 2016, p. 39)

Cultural anthropology has an established understanding of the relational aspects of performance and art making as a core ritual in community building, community thinking and the rehearsal of social roles, where ‘musical performance is a part of its social setting,’ (Chernoff, 1981, p. 153) as a manifestation of shared social and cultural values, and where ‘people express their opinions by participating. They make a contribution to the success of the occasion, and they behave with the understanding that what they do is an act of artistic participation as well.’ (p.153)

As well as a sociocultural understanding of music's meaning, the complexity of this relationship between the various *inter*-personal musical and social phenomena implicit in group singing might also be understood by referring to at least two different forms of 'entrainment', both of which can be measured. Musical entrainment is a phenomenon in which two or more independent rhythmic processes synchronize with each other' (Clayton, Will, & Sager, 2004, p. 1)., and often refers to the common rhythmic effect whereby 'many people tap their feet to the regular "beat" when listening to a piece of music' (Knight, Spiro, & Cross, 2016, p. 100). As entrainment entails 'the shared synchronisation of internal oscillators' (p.99) it might also extend to synchronisation of pitch or harmonization, or other musical features such as the synchronization of vibrato between singers (Daffern, 2017).

Interpersonal neurobiological 'attunement' on the other hand emerges from the field of interpersonal neurobiology (D. J. Siegel, 2012, 2016) and describes the effect whereby individuals synchronise their neurobiology with that of others, and observable through synchronisation of heartrate variability (HRV), mirror neuron system (MNS), respiratory function, or brainwave emissions (Dan Siegel, 2015). A key element of the phenomenon of interpersonal 'resonance' is the recognition of it as a shared experience, and which explains why it might contribute positively to the experience not just of social bonding, but also the underlying neurobiological mechanism of the experience of 'love' (Camlin, 2015; Dunbar, 2013, pp. 16–19; Lewis, Amini, & Lannon, 2001):

When we attune to others we allow our own internal state to shift, to come to resonate with the inner world of another. This resonance is at the heart of the important sense of "feeling felt" that emerges in close relationships. (Daniel Siegel, 2011, p. 27)

Sympathetic Entanglement

My suggestion is that both of these forms of entrainment are in play during group singing and explains in part some of the 'magic' that participants often talk about in their descriptions of the activity. Many of the responses to this survey allude to the powerful moment when the singing and the singers appear to transcend their individual identities and become something much greater than the sum of their parts. As Sharon Durant from Mouthful expresses it in a video interview for this conference:

'The 'feeling it' is the thing. You're not necessarily starting with the feeling of 'this one's going to be really good!' it's just, it's kind of reacting to... there's a magic, or whatever, there's *something* that happens and it *clicks*, y'know? If it's choirs that you're talking about, you have some evenings where, I don't know, it's just that combination of people, where they're at, the room, the lighting, it might, y'know, and lots of it could be exactly the same as the week before, but something just *clicks* and they just, I don't know, I say '*sounds* really good together' but it's not necessarily that, it just... works, y'know? It just flows, there's just something where everyone's contributing whatever they need to contribute at that point in time, and it just, yeah it all flows and you feel it. (Mouthful, 2018)

Because both forms of entrainment are common experiences - and interpersonal neurobiological attunement in particular occurs largely outside of our conscious awareness - I suggest that they are sympathetically entangled during group singing, such that the combined effect of them impacts positively on wellbeing, yet remains hard to isolate in terms of how much of the effect is to do with the music, how much to do with the feeling of

'connection' commonly reported during group singing, and how much an experience of the two forms of entrainment in combination. The concept of entanglement is helpful here, as it helps to explain how music can be both a technology for inducing this experience of interpersonal 'attunement' whilst at the same time being a product of it. The stronger the musical entrainment, the stronger the interpersonal neurobiological attunement, and vice versa.

An important question which then presents itself is, can this 'entanglement' of musical and interpersonal neurobiological entrainment be evidenced? For the hypothesis to be valid - not only true in the minds and stories of those participating – one would need to be able to measure each form of such entrainment, and also demonstrate that these moments of entrainment correlate - with each other, as well as with the actual experience of those participating.

Measuring interpersonal phenomena raises particular methodological challenges, in particular knowing what exactly might be measured to infer interpersonal 'attunement'. However, technological developments mean that it is possible to demonstrate and measure interpersonal attunement by exploring synchronisation between the 'resonance circuitry' (Daniel Siegel, 2011, p. 61) of individuals' brains¹, and indeed some studies of group singing already demonstrate that HRV synchronisation occurs during group singing (Vickhoff et al., 2013), indicating interpersonal neurobiological attunement despite it not being looked for.

The complexity of proving – or disproving – this hypothesis of sympathetic entanglement of musical and interpersonal neurobiological entrainment is beyond the scope and means of this current study because of resource limitations. However, having it in mind when considering the study's findings may help to contextualise those findings in a broader conception of the complexity of the experience of group singing.

Phenomenology

Assuming the hypothesis of sympathetic entanglement of musical entrainment and interpersonal neurobiological attunement is at least a useful way of exploring the phenomenon of group singing, a further set of challenges reveal themselves. If these two forms of entrainment are entangled, they are also hard to separate. Perhaps it is useful to think of the experience of these entangled forms of entrainment as an 'imbrication' (Nelson, 2013), the one bound up in the other and inseparable from the point of view of the experience of the phenomenon. We 'feel' it when we make a good connection, both musically and interpersonally, and this is often the kind of language that people use to describe their experience of these more transcendental moments of group singing. As one participant recently remarked to me, 'we *know* it happens, and we can feel it *when* it happens, so why would we feel the need to *measure* it?' Indeed, conducting scientific experiments which attempt to isolate or separate these forms of entrainment in order to measure each more accurately may also affect or even de-nature the activity, and crucially, the extent to which the effect occurs.

However, without a more critical understanding of the complex mechanism involved, we cannot explain *why* singing in a group is good for us, even though we know it is, and can measure its effects. The recent NICE report into supporting independence and mental well-

¹ 'includes the mirror neuron system (MNS), the superior temporal cortex, the insula cortex, and the middle prefrontal cortex' (p.61)

being of older people (NICE, 2015) concluded that the reason group singing appears to be so effective as a treatment for older people is either because people like music, or they enjoy the social aspects of the activity, or 'something else'. It is this 'something else' which we need to understand, and my *guess* is that this 'something else' is really an experience of the entanglement between musical and interpersonal forms of entrainment. If we want group singing to be discussed as a health-supporting activity in the same way that we talk about, say, diet, exercise or lifestyle, we need to be able to explain the mechanism through which it achieves its effects. The challenge here is that, because of the complex nature of the mechanism, quantitative measurement on its own may be insufficient in revealing the full extent of what is going on during the activity in relation to these two forms of entrainment. We cannot understand the mechanism without understanding people's experience of it, and we therefore need to turn to phenomenology to shed light on the matter.

A phenomenological approach serves at least two useful purposes in building a stronger evidence base: firstly, to ground any measurable results in participant experience, and secondly, to identify possible areas for further investigation. The way that people talk about their experience of group singing can provide insights into the activity which may elude or evade an exclusively quantitative approach, and provide a valid grounding for any conclusions, as well as illuminating any 'dissonance' between the data and people's experience of the activity. People's accounts of their experiences can also highlight areas which fall outside of the purview of the study, and thereby help to qualify any findings, as well as influence future research design.

Hypothesis

The justification for a phenomenological approach is therefore as part of a general hypothesis that musical entrainment and interpersonal neurobiological resonance / attunement are sympathetically entangled in the activity of group singing, and their combined impact on wellbeing can be measured through a triangulation of:

1. measurable entrainment of musical features e.g. rhythmic / harmonic analysis
2. measurable synchronisation of interpersonal neurobiology e.g. HRV / MNS / alpha & beta wave emissions
3. people's experience of the phenomenon of group singing

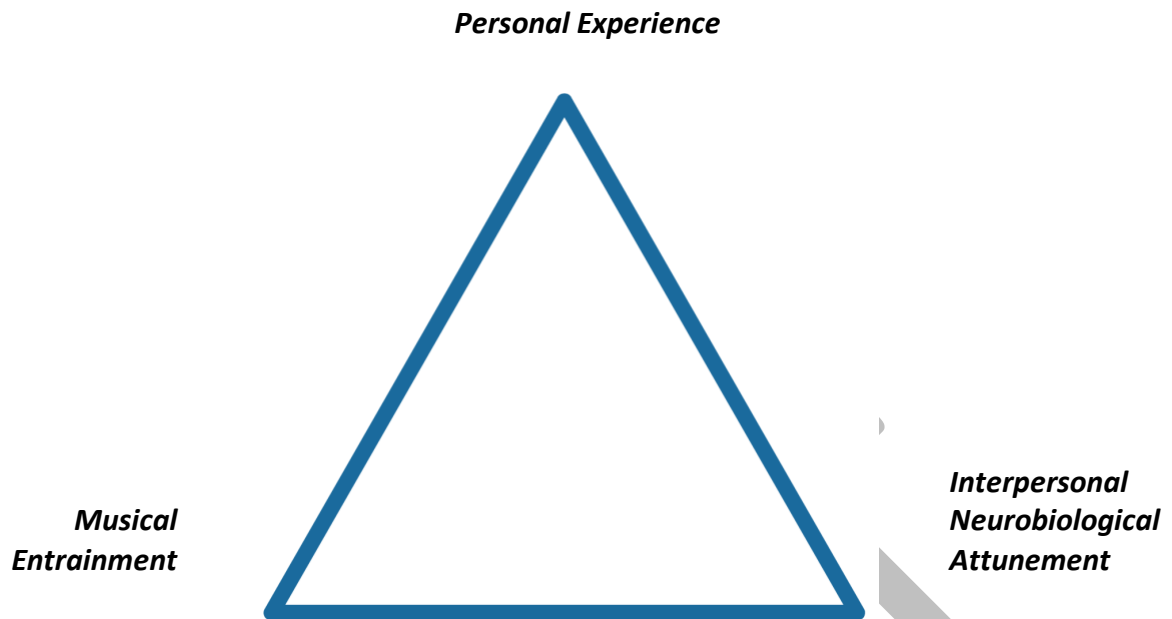


Fig. 1 – research dimensions

While the capability to engage in the first two measures is beyond the scope and means of the current study, what I hope to do is to show how the third - phenomenological – measure can provide some useful insights into the activity of group singing, and that these insights could be more empirically valid when taken as part of a triangulation of the measures outlined above.

Methodology

The Making Sense of Group Singing project pioneers the use of Sensemaker® (Snowden, n.d.) as a ‘distributed ethnography’ methodology in the Arts to collect and analyse the experience of singers through a two-stage process of:

1. collecting personal ‘micro-narratives’ of participant experience;
2. participants’ ‘self-signification’ of the meaning of those stories against various sets of signifying variables grounded in contemporary academic discourse about the value of group singing.

Placing participant experience at the centre of this enquiry is a direct response to the AHRC’s call to look at ‘the actual experience of culture and the arts rather than the ancillary effects of this experience’ (Crossick & Kaszynska, 2016, p. 21). The scientists’ joke that ‘the plural of *story* is not *data*’ is somewhat undermined by this quali-quant approach, as the method provides hard data underpinned by rich narrative.

At 29th June 2018, 110 singers have participated in the research, drawn from across a number of UK community choirs and projects mainly led by musicians from the vocal group, Mouthful (Mouthful, n.d.). The style of choir might be considered to be loosely within the ‘Natural Voice’ (Bithell, 2014; Natural Voice Network, n.d.) tradition of aural learning, using repertoire from global folk traditions alongside original compositions in a spirit of having fun making a good sound together.

Each participant chooses one of three 'prompt' questions to stimulate a response in the form of a story 'fragment' or micro-narrative, usually in written form, but which could instead be represented as an audio recording or a photograph or video recording:

1. Tell a story about an experience that influenced your decision to participate / not participate in group singing.
2. Fast forward to a time in the future where you have to teach a younger person a lesson in the value of group singing. What experience would you share?
3. You are being interviewed by the local media after singing in a group at a recent event. What would you say?

Triads of Signification

Subsequently, participants 'interpret' these story fragments by mapping them against a series of triadic dimensions or 'signifier sets', 3 of which I will outline shortly. The software presents the resulting data as clusters of participant responses within each signifier set. 3 of the 6 signifier sets used on the project are referred to as 'polymorphic' as they are part of a core group of 14 such sets, used across the whole of the international 'Making of Meaning' project (Cognitive Edge, n.d.) which uses Sensemaker[®] as a methodology. The remaining 3 have been constructed for the project by the researcher around principles represented in current literature about group singing. Limitations of space preclude a fuller analysis of all of the resulting data, but I will share 3 of the triads, as an example of the kind of data which is revealed, and its potential significance.

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Triad 1: Belonging (Me, My People, My Place) (n=108)

In the experience shared...

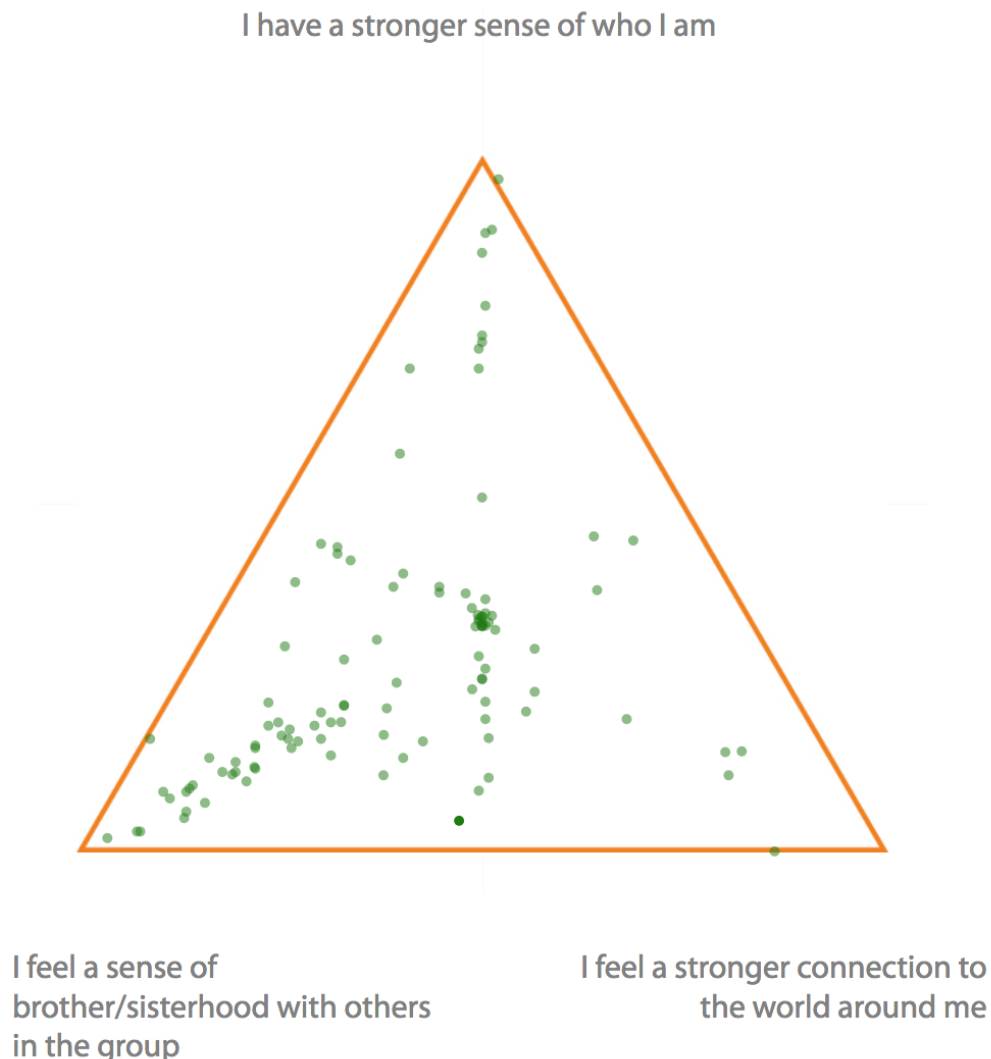


Fig. 2 - Triad 1: Belonging

Each individual dot within the triangle represents the story of one of the individual respondents. Taken together, these individual dots combine to form 'clusters' of meaning.

In this 'polymorphic' triad, people's stories conform broadly to what one might expect from a study of group singing, namely that 76% of responses (n=81) fall within the dimension of feeling 'a sense of sisterhood / brotherhood' with 'my people', emphasising the affordances of group singing to promote social cohesion and bonds of trust and attachment between people. This is represented in people's micro-narratives by comments such as:

- In our choir we shared stories at an anniversary meal about the choir. One woman shared how the group had recorded songs for her father's funeral. Another how she had arrived in the area with few friends and how singing had brought her into social networks that formed the backbone of her friendship group. And I shared how the choir had sung at our civil partnership. I realised then that the choir knits us together. That we sing we laugh we cry and all is held.

- Travelling to the event there was a great sense of comradeship. A 'We're in this together' feeling. You could almost physically get hold of the excitement. We obviously couldn't chatter during the performance but there were masses of shared looks, shared smiles and shared twinkles of eyes. I am not a good singer and I know that but I am made to feel as if I can sing. We came out of the venue much tighter as a group and all wanting to get on to the next venture. Hugely emotionally satisfying and an end feeling like being snuggled in an enormous warm duvet.
- After months of medical issues I can honestly say It was the best medicine so far! I made friendships which I know will last. Unity in Song! We supported each other both physically and emotionally and over the weeks a bond formed between us. I for one felt more confident and comfortable being totally out of my comfort zone. There was a feeling of safeness within the group. Sadness for the weekend being over but excited for the next time we all meet up.

Perhaps more surprising in response to this set of signifiers were the stories of singers who had participated in the ambitious 'Fellowship of Hill and Wind and Sunshine' project (National Trust, n.d.) for the UK National Trust (n=28), involving taking large groups of singers onto the summits of mountains in the Lake District of Cumbria to perform a song cycle commemorating the gift of land containing 14 mountain summits by a local mountaineering group in 1923. While one might have expected that the 'sense of place' would be much stronger in the stories of these participants, in fact they corresponded closely to the same distribution pattern of the larger survey population, with 75% of responses (n=21) falling within the dimension of feeling 'a sense of sisterhood / brotherhood' with 'my people':



Fig. 3 - Triad 1: Belonging (Fellowship)

While 39% of responses (n=11) fall within the 'My Place' dimension, this compares with a similar 31% of responses (n=33) in the larger survey population. The kinds of stories shared included the following responses, which emphasise the sense of social bonding fostered through the activity:

- I wasn't prepared for how moving the song 'Joy of Living' would be when sung on top of Scafell and when a white gull soared over and circled back while we were singing it and rededicating the fell to the memory of the fallen. A rare poignant and truly spiritual moment for me. The singers and the song around me were enormously comforting and it felt as if us singers had really acknowledged and perhaps even lightened the enormous legacy of grief and grieving that war and this one in particular entails.
- Stand out moments were being able to walk with one other member of the choir and have time to listen to her life story and getting to know other members of the group that I hadn't met before. The first time that we sang the Fellowship song on the summit was very moving - singing taps straight into the emotional centre of [our] being: we had finally made it 'upon this mountain summit' singing the song that was the whole reason whilst we were there and looking out over the magnificent

panorama of the mountains.. Singing the words ‘that the freedom of this land the freedom of our sprit shall endure’ to the mountains themselves just made me well up. The sense of camaraderie amongst the group became very strong through our experience today and I feel that I have made friends on a much deeper level.

Triad 2: Experience (spiritual, physical, emotional) (n=108)

In the experience / story I shared, group singing:



Fig. 4 - Triad 2: Experience

In this second ‘polymorphic’ triad, respondents interpret their story according to three dimensions of physical health, emotional wellbeing and a more transcendental / spiritual dimension of experience. Surprisingly, given what is outlined above in terms of the physical benefits of group singing, very few respondents (15% of responses, n=16) identified such benefits as being significant to their experience, with 97% of responses (n=104) falling within the emotional / spiritual dimensions of experience². Examples of stories include the following fragments:

- Singing together takes away your separateness. When I first moved [here] I didn't know anyone and I had an incredibly lonely time to begin with. I felt isolated in a new job and sometimes an entire weekend would go by without me speaking at all

² Although this could be influenced by the different emphasis in the wording of the triad statements between ‘physical’ and ‘mental’ health.

to anyone and it affected my wellbeing to the point of being signed off work with depression. At about that time I started singing with [a local choir] and those evening sings became the one bright thing I looked forward to - there's a connection with other people that happens not just on a social interaction level but in a way that feels much deeper more fundamental. I would come home from those evenings on a high and feeling full of joy at being alive. Group singing is more powerful than you can even begin to imagine. Start doing it and see where it takes you.

- I am a regular swimmer cyclist and gardener. For some time I have recognized the value of these activities in releasing endorphins making me feel good mentally despite the physical demands of all three activities. In addition over the past 7 or 8 years I have been involved in some form of community choral singing and I confess to being quite surprised to find that it has the same refreshing effects on my mental condition. I understand that it has to do with the release of the bodies feel good chemicals. Oxytocin and endorphins being amongst these. I have been lucky enough to be involved with very talented and inspirational choral leaders. All of whom has had very different approach to teaching but who have rigor as a keystone to performance but all of whom have humour and a sense of fun overlaying the practices. There has been a lot of laughter as well as a lot of singing. Of course there are many other benefits including being presented with a chance to interact with people from all sorts of walks of life. This can certainly be mind-expanding. I have found myself involved in some pleasant social groups as a result e.g. cycling with a small group of the choir members.

Again, respondents involved in the 'Fellowship' project (n=29) interpreted their experience in a similar distribution to the whole survey population. Despite the strenuous physical exertion of hiking 8-10 miles over a 10-12 hour period with over 1,000M of ascent, 97% of respondents (n=28) highlighted the emotional and spiritual dimensions of the activity over the physical, with 21% (n=6) emphasising the physical dimension.



Fig. 5 - Triad 2: Experience (Fellowship)

Their stories illuminate this emphasis on the spiritual and emotional dimensions of the activity, and how singing together provided a means of structuring and organising participants' emotional responses to the activity:

- I arrived at [the start of the hike] apprehensive about the physical demands of the day ahead but excited about the project. Our group quickly bonded on the climb to Great Gable and we all felt a sense of achievement as we reached the summit. As we all gathered to sing together there was a great sense of camaraderie and purpose. Looking out on the view as we sang I wouldn't have wanted to be anywhere else. It was a great day we chatted and got to know each other as we walked and sang together.
- So many people have spoken to me about the friendliness of the people involved in the project. It can be an intimidating thing to walk into a room full of strangers but the idea of creating a 'Fellowship' of people who have a shared bond of singing and a shared love of the Lake District fells has I think really worked here. There's definitely a sense of a shared spirit of common ground that has enabled us to come together as a group.
- I sing in a choir regularly - so singing was the attraction to join this Fellowship of hill event but I gained so much more. I have learnt more about the Great War and the

whole weekend has provoked in me an emotional response I was not anticipating. Thinking about the lost lives. The words that resonate are generosity gift love kindness bravery space - for the past the whole experience and the challenge for me is to carry them into the future. I think listening more or paying attention might be the thing. Thank you

- Singing with others takes me out of myself into another space. Singing on Great Gable was an almost mystical experience. I felt my precious sense of self drifting away on a wave of harmony. The fells reach up to the sky and our voices unified the rock and the air and through our singing respect was paid to the people before us who had ventured to meet their destiny. People like my grandfather bayoneted in the Great War lover of mountains and great artist. A man of very few words who loved walking and song. And we walked and we sang and it was beautiful. My legs still ache but my heart is full of gratitude for this opportunity to partake. A day to remember and in remembrance to be thankful.

In response to the question of 'what is singing good *for*?', it may be that it is good for our physical health, but that doesn't appear to be the reason why people sing together. From these accounts, people appear to sing together because it provides opportunities for deep levels of connection – to others, to their environment, and to themselves. As one respondent expressed it, 'singing together has enabled us to meet each other as human beings differently.'

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Triad 4: Value (Aesthetic, Participatory, Social) (n=109)

The experience I shared is about:

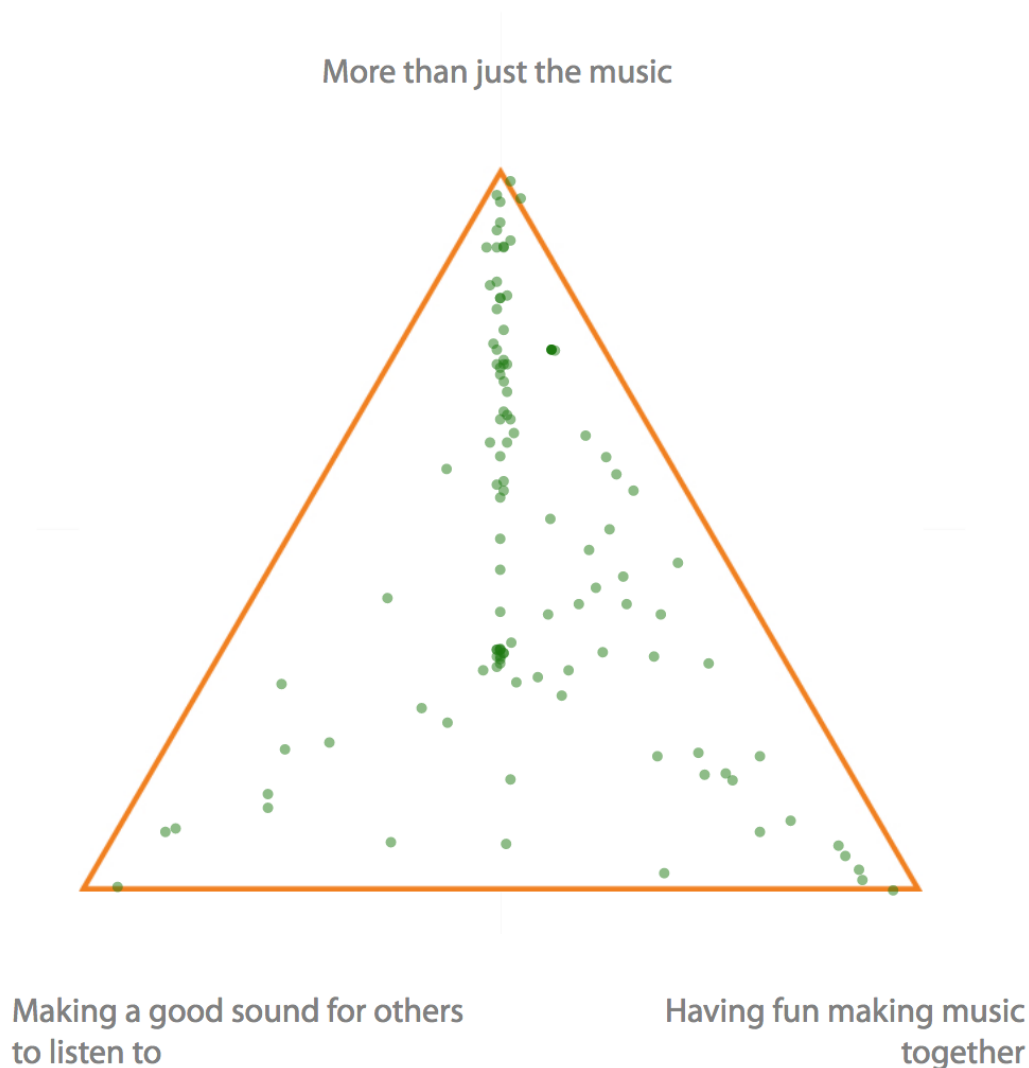


Fig. 6 - Triad 4: Value

This was a bespoke triad, based around the philosophical concept of 'music in three dimensions' developed by the researcher within their doctoral studies, where the aesthetic (D. J. Elliott, 1995; D. J. Elliott & Silverman, 2013) and participatory (Turino, 2008) dimensions of music are united in a third, social, dimension (Camlin, 2014, 2016). By social, what is intended to be conveyed are a range of 'extra-musical' aspects which are broadly socially transformative, and which might include; music's impact on our sense of self and our social and personal identity (DeNora, 2000); its capacity for producing or facilitating 'strong' experiences (Gabrielsson, 2011); its eudaimonic effect, or positive impact on our health and well-being (Creech, 2014; Livesey et al., 2012; Ryan & Deci, 2001; Shakespeare & Whieldon, 2017); its capacity to facilitate trust and cooperation, social cohesion, community formation and transformation (B. Bartleet & Higgins, 2018; B.-L. Bartleet, 2016; Belfiore & Bennett, 2010; Buglass & Webster, 2004; DeNora, 2013; D. Elliott, Silverman, & Bowman, 2016; Hallam, 2015; Livesey et al., 2012; Turino, 2008). 63% of responses (n=68) fall within the extra-musical / social dimension of the experience, highlighting the social impact of

group singing on its participants. Moreover, there is quite a striking pattern of signification here, with 56% of responses (n=60) clustered within a very narrow 'beam' of responses ($x=0.47 - 0.53$) with 97% of those responses (n=58) rising from a point just below the median ($y=0.25$) to the apex of the triangle, suggesting a strong dialogic 'creative tension' (Wegerif, 2012, p. 4) between the other two 'musical' dimensions.

This is a very strong visual correlate of the idea that music's power to affect people's experience of it lies in harnessing *both* the aesthetic and the praxial / participatory dimensions, validating the more philosophical claims of earlier work (Camlin, 2014, 2016) and grounding them in participant experience. Being able to participate in a musical event where the aesthetic qualities of the resulting music are of a high presentational standard clearly reinforces participants' positive experience, and strengthens the social impact of both performance and participation.

Respondents' stories validate this perspective:

- Music helps us to connect - to other people and to nature itself. It helps soothe us in the tough times and shares our joy in the good times. The joint experience magnifies the positive impacts - knowing that warm glow is shared by so many others - and creates a positive feedback loop. The afterglow of such an event as this can last some time before another top-up of singing gives us a boost when we need it most. This event epitomises my love for music - an expression of our innermost feelings and emotions opening up to the world and to those people present. Increased confidence, compassion and joy are obvious benefits to such events as this one but the most profound must be the sense of connection I alluded to earlier. To know our place in this world and smile at it.
- Occasionally the choir I belong to joins with other choirs to sing together and perform at concerts and other events. This sometimes involves 100 or more singers and on one memorable occasion almost 1000! What I experience at these events is similar to my experiences in smaller groups but the intensity of feeling is frequently astonishing and sometimes overwhelming. It is not just the sheer joy of making harmonious sound with other people that is amplified. There are physical sensations that are much more intense in large group singing. For example moments when I am so enthralled by the tidal wave of sound that I am part of creating that I can actually feel the hairs standing up on the back of my neck. Emotionally too the effects can be incredible. The surging harmonies that very large choirs can produce are sometimes almost too much to bear. It is at moments like this that I feel a visceral connection with every other singer in the hall. Although most of these people are 'strangers' to me those moments bring us all together as one. I feel an instant sense of belonging and a deep conviction that we are expressing something fundamentally human that feels important and feels right. Being together singing together breathing together and feeling together - what magic is here!
- Whilst singing a Croatian song during the Festival of Thrift in Redcar with Phoenix Voices I saw a lady sat at a table eating in the walled garden watching us sing and she suddenly burst into tears. She obviously recognised the Croatian song we were singing and took her mobile phone out of her bag and rang someone still crying she held the phone up so the person who she had phoned could also hear us sing. She caught sight of me watching her and started really grinning from ear to ear and she put up her thumb and mouthed thank you. The thought that we had touched her

heart and maybe her friend's heart too was such a beautiful experience. The connections singing together makes is endless and contagious. The world would be a better place if we all sang more.

Discussion

What seems most clear from these preliminary observations of the data is the extent to which the social benefits of group singing appear to outweigh other factors. In Triad 1: Belonging, 76% of responses are located within the social dimension of 'a sense of sisterhood / brotherhood' with 'my people', and this is unaffected by conditions such as the experience of place; in the instance of the Fellowship project, the mountain summits of the Lake District. In Triad 2: Experience, 97% of respondents locate the significance of their experience within its emotional or spiritual dimensions, and this again appears to be unaffected by other conditions such as the strenuous physical exertion of the mountain hiking in the Fellowship project. In Triad 4, 63% of responses (n=68) fall within the extra-musical / social dimension, compared with 55% of responses (n=60) which fall within the musical (aesthetic and participatory) dimensions combined³.

The strong responses to the various social dimensions in the different ways for participants to interpret their experiences supports existing ideas about the social benefits of group singing, but also highlights the relative importance of these social benefits in the minds of participants, compared to some of the other expected benefits e.g. to physical health. These findings are also broadly in alignment with the hypothesis outlined earlier, that these social benefits to mental - and spiritual - wellbeing may be the product of a sympathetic entanglement between musical entrainment and interpersonal neurobiological resonance. Group singing may provide a valuable way of structuring opportunities for 'limbic resonance' (Lewis et al., 2001, pp. 169–170), and for enhancing the effects of such resonance, because musical entrainment benefits from a synchronisation of physiology - primarily breathing, but also movement as well as rhythmic and harmonic synchronisation - which are in turn symptomatic of interpersonal neurobiological attunement (D. J. Siegel, 2016, p. 61). The wellbeing effect may also be enhanced because participants are aware of it when it happens and that the powerful feelings which transcend the musical moment are shared with other participants, and with audiences:

“what you would find is that people would somehow realise – even on some subconscious level – that their state is being shared with another person's state, and in that recognition of the resonance, there's this 'feeling felt' process that happens.”
(Dan Siegel, 2015)

Limitations

There are a number of limitations to the study. The overall population (n=110) of the study is not large, and would need to be significantly increased to be able to make any inferential judgements about the value of group singing more generally to a broader population. As noted earlier, phenomenological data taken on its own does not in any way confirm or refute the musical or neurobiological mechanisms assumed to underpin the findings. This could only be evidenced by a triangulation of the phenomenological data with more measurable outcomes such as rhythmic / harmonic analysis in the case of musical

³ Aesthetic alone 28% n=28; Participatory alone 43% n=46

entrainment, or HRV / MNS / brain wave synchronisation in the case of interpersonal neurobiological attunement.

There are also some underpinning philosophical and sociological limitations which warrant further investigation. Singing appears to be good in a number of ways for those who are able to participate in it, but what about those who feel unable to participate in it, or who simply don't want to? Is singing only good for those who it's good for? What are the strongest drivers of wellbeing and how does group singing reinforce or interfere with those in different personalities / people with different experience? What factors limit the experience of the effect, and under what circumstances might group singing even be a source of negative experience, rather than the positive hedonic experience reported by participants in this study?

The idea of 'entanglement' between musical and neurobiological entrainment throws up some particular challenges in this respect. If the activity of group singing provides a space for people to rehearse and perform healthy 'attachment' (Bowlby, 1988) to others – in both musical and social terms - is such attachment an outcome of the activity, a pre-requisite for it, or both? As an activity, is it more accessible to those with more experience of healthy attachment in the first place, or those willing to seek it out? For those experiencing social anxiety, the idea of revealing yourself intimately through your voice to a large group of strangers might be terrifying, in the same way that the same activity appears to be an almost spiritual one for those confident and able to participate in it. Could it be that one of the reasons that group singing appears to exclude some people from it is precisely because it is entangled with interpersonal neurobiological intimacy? If we view group singing as a celebration of the ability of those who participate in it to demonstrate their capacity for healthy attachment, then where such attachment has been impaired, the intimacy of entrainment may be uncomfortable or even distressing. Under what circumstances might group singing be therefore viewed as an act of 'symbolic violence' (Bourdieu, 1992; Schubert, 2012) against those lacking the experience of healthy attachment or social confidence to involve themselves in it? And how can group singing activities be structured to ensure that those most in need of its benefits are able to participate in it?

A further limitation to the study is in being able to isolate what is fundamentally 'musical' about the phenomenon of sympathetic entanglement of these two forms of entrainment. And are there other activities which work the same way? e.g. dance, team sport? And if the effect is observable, does it arise solely from physically active collective practices, or can the same effect be observed in more physically passive forms of entrainment e.g. collective prayer or meditation? Once a procedure could be established to test the hypothesis, it would be important to test against a number of other control conditions to isolate any exclusively 'musical' element. In a similar vein, it would only be possible through testing the hypothesis that evidence of its validity could be established. It might be the case that a hitherto unidentified phenomenon is at work in its own right which is neither musical nor neurobiological, or that such a phenomenon works in combination with the musical and neurobiological to produce the wellbeing effect.

Conclusion

Despite these limitations, what the data does show is that – at least in the minds of participants – there is a clear benefit to participating in group singing activities which goes a

long way beyond the idea of singing in a group as merely ‘auditory cheesecake’ (Pinker, 2003, p. 534), or a pastime activity. The complex ways in which group singing appears to support its participants to co-construct a eudaimonic social reality is evident, and these social benefits of group singing appear to be emphasised even in the face of other compelling factors such as the impact on physical health or a sense of place. These preliminary findings suggest that a further exploration of the hypothesis that musical entrainment and interpersonal neurobiological attunement are sympathetically entangled is worthwhile, and may lead to a deeper understanding of the complex mechanisms underpinning the uplifting effects of group singing.

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