MUSIC AND SPIRITUALITY

THEOLOGICAL APPROACHES, EMPIRICAL METHODS, AND CHRISTIAN WORSHIP

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George Corbett and Sarah Moerman (eds), *Music and Spirituality: Theological Approaches, Empirical Methods, and Christian Worship*. Cambridge, UK: Open Book Publishers, 2024, https://doi.org/10.11647/OBP.0403

All external links were active at the time of publication unless otherwise stated and have been archived via the Internet Archive Wayback Machine at https://archive.org/web

Updated digital material and resources associated with this volume are available at https://www.openbookpublishers.com/product/0403#resources

ISBN Paperback: 978-1-80511-302-7
ISBN Hardback: 978-1-80511-303-4
ISBN Digital (PDF): 978-1-80511-304-1
ISBN Digital eBook (EPUB): 978-1-80511-305-8
ISBN HTML: 978-1-80511-307-2

DOI: 10.11647/OBP.0403

Cover image: Hans Memling, *Christ with Singing and Music-Making Angels* (1483–1494), Royal Museum of Fine Arts Antwerp, Wikimedia, https://commons.wikimedia.org/wiki/File:Musicerende_engelen,_Hans_Memling,_(1483-1494),_Koninklijk_Museum_voor_Schone_Kunsten_Antwerpen,_779.jpg
Cover design: Jeevanjot Kaur Nagpa

7. From the Sacred to the Ordinary through the Lens of Psychological Science

Yeshaya David M. Greenberg

Music and spirituality have been intertwined within the socio-cultural and religious activities of our human ancestors for millennia. Many of the religions in existence today—for example, Buddhism, Christianity, Hinduism, and Judaism—have historical accounts of music being embedded within the spiritual, and today the modern practices of these religions all continue to use music as a vehicle for self-transcendence and to experience the divine. Thus, spirituality-infused musical experiences impact at least four billion people worldwide and 51% of the world's population. Yet, when it comes to the realm of science, the terms 'music' and 'spirituality' are rarely uttered in the same breath and almost never appear together in any title or abstract in a peer-reviewed empirical study. Perhaps this would make sense for the more natural sciences, like physics, but not for the field of psychology, whose fundamental purpose is to understand human behaviour. In fact, in searching the literature of psychological science and its surrounding sub-disciplines, including the subject specialisms of music cognition and music psychology, the topic of music and spirituality is entirely missing. And yet, of all the topics of inquiry about music—from preferences and perception to universality and therapy—it is the topic of music and spirituality which most interests me. Perhaps this is because it taps deeply into a very essential core of human sonic experience, or even because of my own mystical

 https://doi.org/10.11647/OBP.0403.07

encounters with music.[1] Regardless of my personal preferences and beliefs, however, understanding the mysterious links between music and spirituality poses an immense scientific challenge. Even though this topic is both mystifying and challenging, it does not mean that it is not worth inquiry from a scientific point of view. On the contrary, it is often the topics posing the greatest challenge that can deliver the greatest reward. In this chapter, I will raise issues for researchers to consider, including how to define terms and develop theories in this area. I will also present preliminary results from my own research programme on this subject matter.

Although many chapters in this volume explore how music relates to Christian theology and worship, this chapter thereby takes the opportunity to present theory, research, and findings outside of Christian worship, investigating how music relates to Jewish, Muslim, Hindu, and Buddhist spirituality. The findings presented in this chapter, indeed, are based on data from participants from multiple religions and faiths. The first study presents results from a large group of Jewish singers (from many denominations, including renewal, reform, and conservative Judaism, and modern orthodoxy) who sang wordless melodies together called nigunim, which has no origins in relation to Christianity. In fact, Jewish nigunim were vitalized in Eastern Europe within the historical context of brutal antisemitic pogroms, religious persecution from the Cossacks and others, and in some cases, forced Jewish conversion to Christianity. The second, third, and fourth studies present data from many religions and faiths, including those who identify as Buddhist, Christian, Hindu, Jewish, Muslim, and those who identify as non-religious, including Agnostic, Atheist, and not religious. Finally, the fifth study presents findings from an Israeli-Palestinian youth chorus which includes predominantly Jewish and Muslim participants. Thus, this chapter not only provides an extension beyond Christian worship,

1 My personal journey of faith began with many years of searching for my faith, my spiritual home, for a deeper understanding of who I am. My path led me to explore many religions and faiths, from Hinduism and Buddhism to Christianity and Sufism. But I still did not find what I was looking for. I was lost. After years of searching, through a series of mystical and synchronous events, I landed in the religion and faith of my grandparents, great-great grandparents, great-great-great grandparents, and so on, a lineage that hasn't been broken. I am a Jew, and would be called an observant or a modern orthodox Jew.

but also provides important insight into music of religious traditions that predate Christianity and that may have influenced the music of Christian theology and worship.

I. Setting the Stage

(a) From the Sacred to the Ordinary

The inextricable links between music and spirituality can be observed throughout multiple facets of human life. It can be observed from the most sacred of rituals within religion and shamanistic practices, to the most ordinary of rituals within modern culture. The first area to look in terms of observations about music and spirituality is within rituals and customs of religious practices. Indeed, anthropological and sociological evidence demonstrates that comparable musical styles are rooted in cultural histories originating from opposite ends of the globe. Recent empirical research from computational musicology and music cognition demonstrates how the forms and functions of music have persisted in non-Westernised societies, emphasising the presence of lullabies and the healing aspects the healing aspects of human song.[2]

In the mainstream and contemporary practice of religion, we observe parallels between musical attributes and their form and function. For instance, repetition, synchrony, and communal harmonising are frequently combined with communal rhythm. In Hinduism and Buddhism, a circular chant with a melodic form is used to attain meditative states that bring one closer to a divine sense.[3] In Sufism, the mystical branch of Islam, there are also circular repetitive chants that are chanted in unison, and these are accompanied by circular dances, commonly referred to as whirling dervishes.[4] In Christianity, Gregorian chants are less circular and more linear in their melodic progressions,

2 Samuel A. Mehr, Manvir Singh, Hunter York, Luke Glowacki, and Max M. Krasno, 'Form and Function in Human Song', *Current Biology* 28.3 (2018), 356–68.e5; Samuel A. Mehr, Manvir Singh, Dean Knox, Daniel M. Ketter, Daniel Pickens-Jones, et al., 'Universality and Diversity in Human Song', *Science* 366.6468 (2019), eaax0868.

3 Paramhansa Yogananda, *Cosmic Chants* (Los Angeles, CA: Self-Realization Fellowship Publishers, 1974).

4 Hazrat Inayat Khan, *Mysticism of Sound* (London: Pilgrims Publishing, 1923).

but share similar intervallic and vocalised properties with Buddhist, Hindu, and Sufi music. Judaism combines the forms of the religions of the East and West in a wordless song called nigunim, which features the repetition of multiple phrases, is frequently accompanied by dance, and has both circular and linear aspects to the melodic and intervallic expression.[5] Nigunim are historically most prevalent in Orthodox Judaism and are typically heard in groups of males. However, there are egalitarian groups that feature singing by both males and women, albeit it is even more difficult to access these groups as a researcher, or to get data on them, since they occur in more naturalistic environments and are very rare.

Organised religion is not the only source, however, where we find music immersed with spirituality. Everyday cultural events such as concerts, community events, cultural rituals (for example, graduations or weddings), or even ordinary daily activities like sitting in transit on the bus listening to music with earbuds, can evoke a profound spiritual experience, turning the ordinary into the extraordinary. Given the breadth of contexts in which the intertwining of music and spirituality can be both experienced and observed, my preliminary research programme investigates this area across a spectrum from the sacred to the ordinary. Furthermore, given the similarities and differences that can be observed in music-based spirituality activities across religious and spiritual practices described above, my programme also investigates the universals and variations of spirituality and music. Before describing my research programme, I first take a step back to consider important issues about definitions and theory.

(b) Defining Terms

There are many obstacles to conducting research in this area, beginning with defining terms. What is 'spirituality', and how is it dissimilar to religiosity? What is music? And what is the combination of the two (the spirituality of music or the music of spirituality)? Due to their scope, these questions would warrant their own chapter; nevertheless, there are a few observations and conclusions we can make to find our footing.

5 DovBer Pinson, *Inner Rhythms: The Kabbalah of Music* (Northvale, NJ: Jason Aronson, 2000).

The John Templeton Foundation defines spiritual realities to include: '…love, compassion, purpose, creativity, time, mind, infinity, complexity, and understanding, to name just a few, and these are for Sir John just as real as, and perhaps—as in the case of Ultimate reality—even more real than, tangible objects or physical forces like gravity'.[6] From this interpretation of spiritual realities, we may understand spirituality to encompass an interest, exploration, and experience of non-physical realities. There are numerous additional locations from which we can define spirituality. For example, in the realm of psychological science, Ralph Piedmont and others argue that spirituality can be understood as an individual difference in personal characteristics.[7] That is, people differ in their levels of spirituality: while some may be extremely spiritual, others may not be spiritual at all. Here, Piedmont demonstrated that spirituality is a distinct dimension of human personality from the Five-Factor Model of Personality (also known as the Big Five Model), which is currently the most widely used and accepted model of personality. This was a significant step in research towards recognising spirituality as a particular orthogonal human construct distinct from other human personality traits, addressing potential criticisms that spirituality is merely an aspect or facet of a fundamental personality trait such as the trait 'openness', with which it is often correlated. Additional research has echoed this notion empirically showing that spirituality and religiosity should be measured and analysed in multivariate terms that distinguishes the two from standard taxonomies and constructs like personality traits.[8]

There are numerous resources where readers can find answers to queries about the definition of music, so I will not address it here. However, it is germane to this chapter to discuss which spiritual

6 Templeton Religion Trust, 'Request for Proposals', *Art Seeking Understanding*, March 2021, §2 https://templetonreligiontrust.org/wp-content/uploads/2021/03/TRT_Art_Seeking_Understanding_RFP2_Mar2021-1.pdf

7 Ralph L. Piedmont, 'Does Spirituality Represent the Sixth Factor of Personality? Spiritual Transcendence and the Five-Factor Model', *Journal of Personality* 67.6 (1999), 985–1013; Robert R. McCrae and Oliver P. John, 'An Introduction to the Five-Factor Model and Its Applications', *Journal of Personality* 60.2 (1992), 175–215; C. Robert Cloninger, Thomas R Przybeck, Dragan M Svrakic, and Richard D Wetzel, 'The Temperament and Character Inventory (TCI): A Guide to Its Development and Use', *The Psychology of Religion* 73.3 (n.d.), 1176–78.

8 Cloninger et al., 'The Temperament and Character Inventory (TCI)', 1176–78.

activities are regarded as musical. For instance, are sounds that are solely percussive and rhythmic but not melodic, as in a shamanic drum circle, or chants like 'OM' and repeated mantras, considered to be music? My initial conclusion on this matter is that there is indeed a threshold in which auditory noise or vocalisations become music. This threshold lies, on the one hand, with the intention of the composer or performer, and the perception of the listener; on the other hand, the organisation and variability of the audio configurations that are in question play a role. For example, I would argue that shamanic drum circles that are only percussive, with variations in rhythmic features, should be considered music. However, I would argue that a metronomic chant like 'OM' with a metronomic rhythmic pulse but no variations in rhythm, pitch, melody, or harmony, should not be considered music. But when it comes to a mantra like 'Om Namo Bhagavate Vasudevaya' which has alterations in both rhythm and melody (via intervallic shifts), I would argue that this is indeed music. Precise answers to these questions are needed, however, for the topic of music and spirituality to develop.

Another issue arising is how to describe the particular relationship between music and spirituality. Can a phrase like 'spirituality of music' be used? Probably not—music is not inherently something that can be spiritual or non-spiritual. The extent to which music is perceived as spiritual is dependent upon the perception of the observer, as well as the intention of the composer and performer. Therefore, the spirituality of music does not seem to be an appropriate term either. The term 'music of spirituality' also does not work, as it refers only to music that is used in spiritual contexts, and the empirical study of music and spirituality extends far beyond this. Therefore, the phrase 'music and spirituality' remains an ideal route in terms of a descriptive mechanism of the subject area for the time being.

(c) Theory and Hypotheses

This research area faces not only a problem of definitions but also a theoretical challenge. Scientific investigation is predicated on the development and testing of hypotheses, followed by the pursuit of replication and replication extensions across multiple studies to establish a scientific consensus regarding the theory's viability. The same is true regarding music and spirituality. But establishing theory and

applying the scientific method poses difficulties because many aspects of spirituality are difficult to quantify. Suppose, for instance, I develop the hypothesis that synchronised singing during prayer can bring a person closer to God. From a scientific standpoint, it is impossible to prove or disprove this hypothesis because it is impossible to prove or disprove God's existence using the scientific instruments currently available. Therefore, to address this hypothesis, we need to turn to a field like psychology, which is accustomed to investigating concepts that are not visible to the human eye (e.g., human consciousness), non-conscious cognitive processes, and solely subjective phenomena in the mind of the subject being observed. Since the definition of spirituality implies observations about non-physical realities that cannot be observed tangibly, many hypotheses will need to rely on subjective and phenomenological experience. In order to test the synchronised singing hypothesis, for example, we would need to adjust the hypothesis to demonstrate that synchronised singing during prayer can increase a person's feeling of being close to their sense of God. Many of the questions we confront regarding music and spirituality will face similar challenges. It is important to note that theory testing is not the sole method for advancing scientific investigation. Conducting research studies without building on prior theory is, in my view, highly valuable. Indeed, one of the greatest scientific discoveries of the twentieth century was of the double helix by Watson and Crick. The immense importance of this discovery was not because it confirmed a prior theory, but because of its precise observation based on its advanced instruments and the methods of the time.

Given that many theories and hypotheses will be founded on the subjectivity of the observer, it is natural to locate the empirical study of music and spirituality within psychological science. There are numerous entry points within the field of psychology for research into music and spirituality. The topics of mysticism, self-transcendence, meaning in life, and awe have been well-received within the discipline of psychological science, and there are journals in this realm that specialise in spirituality, including the peer-reviewed journal, *Psychology of Religion and Spirituality*, published by the American Psychological Association.[9] Yet, based on a

9 On mysticism, see Ralph W. Hood and Leslie J. Francis, ' Mystical Experience: Conceptualizations, Measurement, and Correlates', in *APA Handbook of Psychology,*

search of the journal since 2008, the year when it was established, there have been no published studies on music. In fact, music is mentioned in just two abstracts: once as an example of a feature of shamanic rituals and another time not to do with music at all per se, but because it used 'MUSIC' as an acronym for the Multisite University Study of Identity and Culture.[10]

Interactionist theories, that posit that people seek external environments that reflect and reinforce their internal psychological states and traits, are helpful theoretical frameworks.[11] From how people construct their bedrooms to where they choose to live geographically, people choose to surround themselves with objects, people, and locations that reflect their personalities.[12] Interactionist theories have also been extended to the music with which people surround themselves.[13] More than two decades of research has convergently shown that musical preferences are reflective of people's personality traits. Even

Religion, and Spirituality i: Context, Theory, and Research', ed. by Kenneth I. Pargament, Julie I. Exline, and James W. Jones (Washington, DC: American Psychological Assoc., 2013), pp. 391–405; on self-transcendence, see David Bryce Yaden, Jonathan Haidt, Ralph W Hood, David R Vago, and Andrew B. Newberg, 'The Varieties of Self-Transcendent Experience', *Review of General Psychology* 21.2 (2017), 143–60; on meaning in life, see Michael F. Steger, Patricia Frazier, Shigehiro Oishi, and Matthew Kaler, 'The Meaning in Life Questionnaire: Assessing the Presence of and Search for Meaning in Life', *Journal of Counseling Psychology* 53.1 (2006), 80–93; on awe, see Dacher Keltner and Jonathan Haidt, 'Approaching Awe, a Moral, Spiritual, and Aesthetic Emotion', *Cognition & Emotion* 17.2 (2003), 297–314.

10 Amber R. C. Nadal, Sam A. Hardy, and Carolyn McNamara Barry, 'Understanding the Roles of Religiosity and Spirituality in Emerging Adults in the United States', *Psychology of Religion and Spirituality* 10.1 (2018), 30–43; Michael Winkelman, 'Shamanism as a Biogenetic Structural Paradigm for Humans' Evolved Social Psychology', *Psychology of Religion and Spirituality* 7.4 (2015), 267–77.

11 David M. Buss, 'Selection, Evocation, and Manipulation', *Journal of Personality and Social Psychology* 53.6 (1987), 1214–21.

12 S. C. Matz, M. Kosinski, G. Nave, and D. J. Stillwell, 'Psychological Targeting as an Effective Approach to Digital Mass Persuasion', *Proceedings of the National Academy of Sciences* 114.48 (2017), 12714–19; Markus Jokela, Wiebke Bleidorn, Michael E. Lamb, Samuel D. Gosling, and Peter J. Rentfrow, 'Geographically Varying Associations between Personality and Life Satisfaction in the London Metropolitan Area', *Proceedings of the National Academy of Sciences* 112.3 (2015), 725–30; Samuel D. Gosling, Sei Jin Ko, Thomas Mannarelli, and Margaret E. Morris, 'A Room With a Cue: Personality Judgments Based on Offices and Bedrooms', *Journal of Personality and Social Psychology* 82.3 (2002), 379–98.

13 Peter J. Rentfrow and Samuel D. Gosling, 'The Do Re Mi's of Everyday Life: The Structure and Personality Correlates of Music Preferences', *Journal of Personality and Social Psychology* 84.6 (2003), 1236–56.

further, research has shown that there exists a self-congruity effect of music whereby people seek out the music of artists who share similar personalities as themselves.[14]

It is not a far leap to extend this theory to spirituality, and therefore to suggest that people seek musical environments that reflect and reinforce their spirituality, and further, that these environments might fulfil their spiritual needs. The twentieth-century saxophonist, John Coltrane (1926–67), arguably one of the most influential musicians of modern times, said:

> My music is the spiritual expression of what I am—my faith, my knowledge, my being… When you begin to see the possibilities of music, you desire to do something really good for people, to help humanity free itself from its hangups … I want to speak to their souls.[15]

Without intending to do so, Coltrane provides anecdotal support for the interactionist theory applied to music; namely, that musical expression can be a self-expression of spirituality, and this sets the stage for my research programme on the correlations between trait spirituality and music across many populations.

II. A Preliminary Research Programme

(a) The Sacred

To begin my investigation into the sacred, I first examined the psychological effects of wordless sacred melodies called nigunim, mentioned earlier in this chapter. These melodies are a preserved musical form that exists in many Jewish communities today. Although there is some musicological and religious literature about them, there is no empirical literature. Nigunim is one of the oldest musical styles in Judaism. It was revived by Chassidism, an Eastern European Jewish sect

14 David M. Greenberg et al., 'Universals and Variations in Musical Preferences: A Study of Preferential Reactions to Western Music in 53 Countries', *Journal of Personality and Social Psychology* 122.2 (2022), 286–309; David M. Greenberg, Sandra C. Matz, H. Andrew Schwartz, and Kai R. Fricke, 'The Self-Congruity Effect of Music', *Journal of Personality and Social Psychology* 121.1 (2020), 137–50.

15 As quoted in Chris DeVito, *Coltrane on Coltrane: The John Coltrane Interviews* (Chicago, IL: Chicago Review Press, 2012).

that arose in the eighteenth century, and which is a form of Judaism that significantly incorporates Kabbalistic concepts. The nigun (the singular form of nigunim) is the focal point of Chassidic devotion. In the most traditional sense, a nigun is an endlessly repeated melody without words. The melody can be simple or complex, and while nigunim can be performed solo, they are typically sung in groups to enhance their effect. Nigunim are traditionally chanted without instruments; however, contemporary musicians have begun to incorporate harmonic, rhythmic, and melodic instruments into their performances. The iteration of a nigun can induce a communally experienced ecstatic state, frequently involving dance and movement, and one such Chassidic sect was so profoundly affected by the nigun that they would perform somersaults out of euphoria.[16]

In 2019, I conducted research with participants attending a three-day workshop with an egalitarian organisation in New York City, where they sang nigunim in large groups in concentric circles. At the workshop, 200 members of the Jewish faith gathered to sing nigunim from 9 a.m. to 5 p.m. This is an unusual amount of time to be immersed in music, particularly when it involves music of a single form or genre and a form that features much repetition. Over the course of three days, I administered psychometric questionnaires to the group and obtained saliva samples before and after singing sessions that lasted an hour and a half in duration. Even though the saliva samples to measure hormones were interrupted by the COVID-19 pandemic (we are still in the process of analysing the samples), the psychometric test results have been analysed. These tests included the Inclusion in Community Scale (ICS)[17] and the Center for Epidemiologic Studies Depression Scale Revised (CESD-R-10).[18]

Initial findings indicate, as discussed in my TEDx talk in 2021, that over the course of three days, a sense of community inclusion among

16 Pinson, *Inner Rhythms*.

17 Mashek, Debra, Lisa W. Cannaday, and June P. Tangney, 'Inclusion of Community in Self Scale: A Single-Item Pictorial Measure of Community Connectedness', *Journal of Community Psychology* 35.2 (2007), 257–75, http://dx.doi.org/10.1002/jcop.20146.

18 Thröstur Björgvinsson, Sarah J. Kertz, Joe S. Bigda-Peyton, Katrina L. McCoy, and Idan M. Aderka, 'Psychometric Properties of the CES-D-10 in a Psychiatric Sample', *Assessment* 20.4 (2013), 429–36.

participants increased by 37% and depression symptoms decreased by 33%.[19] Additional analysis indicated that people's self-descriptions of spirituality and ratings of spiritual emotions increased from day one to day three. Furthermore, participants indicated that, on average, spiritual emotions were evoked more than either positive emotions or negative emotions. These findings are consistent with prior biological evidence demonstrating that group singing can increase oxytocin, which contributes to a sense of social connectedness, and decreases cortisol, which is associated with stress.[20] This study, in addition to observing a preserved sacred activity, provided a unique opportunity to observe the collective impact that singing in a very large group can have. The research also raises important questions about the intrinsic musical elements that facilitate the positive effects of collective group singing, along with the role of individual differences in personal characteristics that may contribute to these effects. Further, it raises questions about the role of music and spirituality within frameworks of human evolution and human song, including the credible signalling hypothesis (which is an extension of the coalition signalling hypothesis), the social bonding hypothesis, and the theory of human herding.[21] It also raises questions about how these positive effects might manifest within peak spiritual experiences that are less confined to sacred spaces and that may be present in contemporary Westernised cultures.

19 David Greenberg, 'How Music Can Break Social Barriers | Dr. David Greenberg | TEDxRamatAviv', online video recording, *YouTube*, 3 December 2021, https://www.youtube.com/watch?v=evVRxrOo5iw

20 Arla Good and Frank A. Russo, 'Singing Promotes Cooperation in a Diverse Group of Children', *Social Psychology* 47.6 (2016), 340–44; Jason R. Keeler et al., 'The Neurochemistry and Social Flow of Singing: Bonding and Oxytocin', *Frontiers in Human Neuroscience* 9 (2015), 518; Gunter Kreutz, 'Does Singing Facilitate Social Bonding?', *Music and Medicine* 6.2 (2014), 51–60; D. Fancourt and R. Perkins, 'Effect of Singing Interventions on Symptoms of Postnatal Depression: Three-Arm Randomised Controlled Trial', *The British Journal of Psychiatry* 212.2 (2018), 119–21.

21 See for examples of these hypotheses and theories Edward H. Hagen and Gregory A. Bryant, 'Music and Dance as a Coalition Signaling System', *Human Nature* 14.1 (2003), 21–51; Samuel A. Mehr, Max M. Krasnow, Gregory A. Bryant, and Edward H. Hagen, 'Origins of Music in Credible Signaling', *Behavioral and Brain Sciences* 44 (2020), e60; Patrick E. Savage et al., 'Music as a Coevolved System for Social Bonding', *Behavioral and Brain Sciences* 44 (2020), e59 https://doi.org/10.1017/s0140525x20000333; David M. Greenberg, J. Decety, and I. Gordon, 'The Social Neuroscience of Music: Understanding the Social Brain through Human Song', *American Psychologist* 76.7 (2021), 1172–85.

(b) Peak Spiritual Experiences

Abraham Maslow, one of the first researchers of peak experiences, defined it as 'a sensory and perceptual experience, usually brief and profound, accompanied by enhanced perception, appreciation, and comprehension'.[22] Several years later, Alf Gabrielsson expanded the concept's terminology to include 'Strong Experiences of Music' (SEM) when he adopted it for the study of music.[23] Gabrielsson argued that the term 'peak' was normally only attached to positive experiences. In fact, Maslow himself characterised peak experiences as 'the moment of the greatest happiness and fulfillment'.[24] Gabrielsson acknowledged, however, that such phenomenological experiences are not always regarded as positive and can be accompanied or dominated by intense emotions that are not necessarily positive or euphoric. Therefore, Gabrielsson asked his research participants to characterise 'the strongest, most intense' musical experience they have ever had.[25] This research has been replicated and expanded upon in a number of studies.[26]

My prior research into individual differences of musical engagement involved inquiring into people's daily experiences of music when listening attentively to it. I asked participants from multiple cultures, including Pakistan, Japan, the United States, and the United Kingdom, the following: 'Describe in your own words the most powerful, intense musical experience you have ever had. Please write as much as you'd like...' I observed that many of the responses contained both explicit spiritual overtones and implicit spiritual undertones. Participants from

22 Abraham Maslow, *Religions Values and Peak-Experiences* (n.p.: Rare Treasure Editions, 1964).

23 Alf Gabrielsson, 'Emotions in Strong Experiences with Music' in *Handbook of Music and Emotion: Theory and Research*, ed. by Patrik N. Juslin and John A. Sloboda (Oxford: Oxford University Press, 2010), pp. 547–604.

24 Abraham Maslow, *The Farther Reaches of Human Nature* (New York: Viking Press, 1971).

25 Gabrielsson, 'Emotions in Strong Experiences', pp. 547–604. Alf Gabrielsson, *Strong Experiences with Music: Music Is Much More than Just Music* (Oxford, UK: Oxford University Press, 2011); Alf Gabrielsson and L. S. Wik, 'Strong Experiences Related to Music: A Descriptive System', *Musicae Scientiae*, 7 (2003), 157–217.

26 See, for example, Alexandra Lamont, 'University Students' Strong Experiences of Music: Pleasure, Engagement, and Meaning', *Musicae Scientiae* 15.2 (2011), 229–49; Alexandra Lamont, 'Emotion, Engagement and Meaning in Strong Experiences of Music Performance', *Psychology of Music* 40.5 (2012), 574–94.

each of the countries I observed exhibited this pattern. To replicate and extend these findings, I obtained new data from over 600 participants. The same SEM question was administered, but this time I also asked respondents to rate each experience on a scale from 1 (not at all spiritual) to 5 (very spiritual). This permitted spiritual and non-spiritual experiences to be categorised separately. Initial findings indicated that the levels of depth attributed to the music, as well as the rhythmic and cathartic aspects of engagement, were the most significant predictors of whether a strong musical experience was described as spiritual or not. Further, none of the Big Five personality traits, including the trait openness, contributed significantly to the statistical model. The results from this study suggested that musical aspects of strong experiences are more important than psychodemographic information in determining whether the experience was spiritual or not.

(c) Spirituality and Music in Everyday Life

When it comes to studying the uses and effects of music in daily life, musical preferences and musical engagement are frequently evaluated. As discussed above, strong musical experiences revealed that both musical attributes and musical engagement contribute to the spirituality of musical experiences. Next, I aimed to determine if there were any correlations between people's everyday musical preferences and engagement and aspects of their spiritual lives. To measure preferences, an audio-based musical preferences test was administered to over 2,800 people. This preference test, which has been used frequently in previous research, asks individuals to listen to fifteen-second excerpts from Western music and to rate their liking for each.[27] There were twenty-five administered excerpts, which represented sixteen genres and sub-genres. Based on prior theory and research, the arousal-valence-depth model can be applied to this test to derive three broad factors of musical

27 Kai R. Fricke, David M. Greenberg, Peter J. Rentfrow, and Philipp Y. Herzberg, 'Computer-Based Music Feature Analysis Mirrors Human Perception and Can Be Used to Measure Individual Music Preference', *Journal of Research in Personality*, 75 (2018), 98–102; David M. Greenberg et al., 'The Song Is You', *Social Psychological and Personality Science* 7.6 (2016), 597–605; Gideon Nave et al., 'Musical Preferences Predict Personality: Evidence From Active Listening and Facebook Likes', *Psychological Science* 29.7 (2018), 1145–58.

attribute preferences.[28] The Engagement with Musical Inventory (EMI) was also administered, which measures attentive listening engagement and identifies five listening dimensions: analysing, healing, dancing, narrative, and bonding.[29] Participants were asked to complete the Awe Scale (AWE-S),[30] the Self-Transcendence factor of the Temperament and Character Inventory (TCI),[31] and a short version of Hood's Mysticism Scale (M-scale).[32] In addition, participants completed a measure of the Big Five personality traits and demographic information. Over 2,800 individuals completed all measures. Initial findings indicate that musical engagement explains more variance in all three spiritual measures than either personality traits or demographics. The findings suggest that musical preferences and engagement may be better indicators of spirituality than other psychological factors such as personality.

III. Extensions and Future Directions

(a) Universals and Variations of Spiritual Experiences

In recent years, questions regarding the universality of music have emerged. The literature has advanced well beyond the question of whether or not music is a human universal, of which the consensus is both 'yes and no'. The current questions in this research area focus on which aspects of musical experience are universal and which are

28 Greenberg et al., 'The Song Is You', 597–605; Kai R. Fricke, David M. Greenberg, Peter J. Rentfrow, and Philipp Y. Herzberg, 'Measuring Musical Preferences from Listening Behavior: Data from One Million People and 200,000 Songs', *Psychology of Music* 49.3 (2019), 371–81.

29 David M. Greenberg and Peter J. Rentfrow, 'Rules of Engagement: The Structure of Musical Engagement and Its Personality Underpinnings', in *Proceedings of the Ninth Triennial Conferences of the European Society for the Cognitive Sciences of Music*, ed. by J. Ginsborg et al. (Manchester, 2015).

30 David B. Yaden et al., 'The Development of the Awe Experience Scale (AWE-S): A Multifactorial Measure for a Complex Emotion', *The Journal of Positive Psychology* 14.4 (2019), 474–88.

31 Cloninger et al., 'The Temperament and Character Inventory (TCI)', 1176–78.

32 Heinz Streib, Constantin Klein, Barbara Keller, and Ralph Hood, 'The Mysticism Scale as a Measure for Subjective Spirituality: New Results with Hood's M-Scale and the Development of a Short From', in *Assessing Spirituality in a Diverse World*, ed. by Amy L. Ai et al. (Cham: Springer, 2021), pp. 467–91.

variant. There are universals in the form and function of music;[33] pitch perception;[34] subjective affective responses to music;[35] and preferences for Westernised music[36] (but not the distinct in preference for consonant and dissonant sounds).[37]

Testing universality necessitates the use of enormous datasets that are geographically diverse and representative of numerous nations and societies. The Musical Universe project has been a public engagement platform since 2017 where people around the world have been able to take music and psychometric tests.[38] More than 350,000 people have taken tests about musical preferences, personality traits, musical engagement, and more. Participants completed a single-item global assessment of their spirituality that asked, 'How spiritual are you?' with answer options ranging from 1 (not at all spiritual) to 5 (very spiritual). Single-item measures to assess spirituality and religiosity are standard practice and single-item measures in general are found to be reliable and valid across multiple psychological domains.[39]

33 Samuel A. Mehr, Manvir Singh, Hunter York, Luke Glowacki, and Max M. Krasnow, 'Form and Function in Human Song', *Current Biology* 28.3 (2018), 356–68. e5; Samuel A. Mehr et al., 'Universality and Diversity in Human Song', *Science* 366.6468 (2019), eaax0868.

34 Nori Jacoby et al., 'Universal and Non-Universal Features of Musical Pitch Perception Revealed by Singing', *Current Biology* 29.19 (2019), 3229–43.e12; Alan S. Cowan, Xia Fang, Disa Sauter, and Dacher Keltner, 'What Music Makes Us Feel: At Least 13 Dimensions Organize Subjective Experiences Associated with Music across Different Cultures', *Proceedings of the National Academy of Sciences* 117.4 (2020), 1924–34.

35 Jacoby et al., 'Universal and Non-Universal Features of Musical Pitch Perception Revealed by Singing', 3229–43.e12; Cowen et al., 'What Music Makes Us Feel', 1924–34.

36 Greenberg et al., 'Universals and Variations'.

37 Josh H. McDermott, Alan F. Schultz, Eduardo A. Undurraga, and Ricardo A. Godoy, 'Indifference to Dissonance in Native Amazonians Reveals Cultural Variation in Music Perception', *Nature* 535.7613 (2016), 547–50.

38 *Musical Universe*, https://www.musicaluniverse.io

39 See, for example, Richard L. Gorsuch and Sam G McFarland, 'Single vs. Multiple-Item Scales for Measuring Religious Values', *Journal for the Scientific Study of Religion* 11.1 (1972), 53–64; Ellen L. Idler et al., 'Looking Inside the Black Box of "Attendance at Services": New Measures for Exploring an Old Dimension in Religion and Health Research', *The International Journal for the Psychology of Religion* 19.1 (2009), 1–20; Shalom H. Schwartz and Sipke Huismans, 'Value Priorities and Religiosity in Four Western Religions', *Social Psychology Quarterly* 58.2 (1995), 88–107; Susan Sprecher and Beverley Fehr, 'Compassionate Love for Close Others and Humanity', *Journal of Social and Personal Relationships* 22.5 (2005), 629–51; Karen B. DeSalvo et al., 'Assessing Measurement Properties of Two Single-Item

There was data for over 76,000 participants. The initial results showed that when compared to personality traits, demographics, and other musical factors, including musical importance, preferences for low arousal in music (with slower tempos, calming and relaxing attributes) were most strongly associated with trait spirituality. There were sixty-four nations represented with at least sixty-seven participants, which is the minimum required for a power analysis to assess correlation in G*Power.[40] The associations between trait spirituality and a preference for low arousal in music were largely consistent across nations. Regarding musical engagement, there were only fourteen nations in which there was sufficient data available. Here, the associations between trait spirituality, storytelling engagement (i.e. focusing on the narrative and symbolic elements of music), and healing engagement (affective responses to music including catharsis) were largely consistent with trait spirituality. Results indicate that associations between spirituality traits and music in daily life are essentially universal. These initial findings from the preliminary research programme are the first to show that there are universal features to aspects of music and spirituality.

(b) Social Conflict between Religions and Cultures

Understanding that music has universal characteristics has implications for social psychology and group processes, including the function of music in reducing social, cultural, and religious conflict. Intergroup cultural conflict is a serious threat to the social fabric worldwide, and it is often rooted in religious ideology and differences.[41] The

General Health Measures', *Quality of Life Research* 15.2 (2006), 191–201; Richard W. Robins, Holly M. Hendin, and Kali H. Trzesniewski, 'Measuring Global Self-Esteem: Construct Validation of a Single-Item Measure and the Rosenberg Self-Esteem Scale', *Personality and Social Psychology Bulletin* 27.2 (2001), 151–61; John P. Wanous and Arnon E. Reichers, 'Estimating the Reliability of a Single-Item Measure', *Psychological Reports* 78.2 (1996), 631–34; John P. Wanous, Arnon E Reichers, and Michael J Hudy, 'Overall Job Satisfaction: How Good Are Single-Item Measures?', *Journal of Applied Psychology* 82.2 (1997), 247–52; John P. Wanous and Michael J. Hudy, 'Single-Item Reliability: A Replication and Extension', *Organizational Research Methods* 4.4 (2001), 361–75.

40 Franz Faul, 'Statistical Power Analyses Using G*Power 3.1: Tests for Correlation and Regression Analyses', *Behavior Research Methods* 41 (2009), 1149–60.

41 World Economic Forum, *The Global Risks Report 2020 Insight Report* (Geneva: WEF, 2010), https://www3.weforum.org/docs/WEF_Global_Risk_Report_2020.pdf

Israeli–Palestinian conflict, in particular, has been among the most complex and persistent social, cultural, and political conflicts in the world.[42] This conflict has well-known negative effects on mental health, physiology, and behavior.[43]

Earlier in this chapter, I described similarities between Chassidic and Sufi musical elements — Chassidism being the mystical sect of Judaism and Sufism being the mystical sect of Islam. Bringing religions and cultures together through music can provide a platform for communicating and exchanging ideas in a safe environment that necessitates listening to each other, and the area of music and spirituality is ideally situated to be a medium in which to both study and apply this concept.

I began this line of inquiry with a pilot study of the Jerusalem Youth Chorus (JYC), which brings together Arab-Palestinians and Jewish-Israelis who are adolescents and young adults from East and West Jerusalem. The chorus members are both religious and secular. In the study, I administered psychometric measures to alumni members during a three-day workshop. The measures included both assessments of community inclusion and depression/anxiety. The initial results showed an increase in a sense of community inclusion by 18% and decreased their depressive symptoms by 17%. Intriguingly, these percentages are lower than those observed in the more homogeneous group of egalitarian Jewish participants in the first study I described in this chapter, but this is expected given the heterogeneity disparities between the groups.

In addition, participants were asked to evaluate their prior experience with the chorus using a variety of psychometric tests. Participants

42 Daniel Bar-Tal, 'Societal Beliefs in Times of Intractable Conflict: The Israeli Case', *International Journal of Conflict Management* 9.1 (1998), 22–50; Darcy R. Dupuis, Roni Porat, and Michael J. A. Wohl, 'Collective Angst in Intractable Conflicts: How Concern for the Ingroup's Future Vitality Shapes Adversarial Intergroup Relations', in *The Social Psychology of Intractable Conflicts, Celebrating the Legacy of Daniel Bar-Tal, Volume I*, ed. by Eran Halperin and Keren Sharvit, Peace Psychology Book Series 27 (Cham: Springer, 2015), pp. 131–42.

43 Jonathan Levy et al., 'Adolescents Growing up amidst Intractable Conflict Attenuate Brain Response to Pain of Outgroup', *Proceedings of the National Academy of Sciences* 113.48 (2016), 13696–701; Ruth Pat-Horenczyk et al., 'Posttraumatic Symptoms, Functional Impairment, and Coping among Adolescents on Both Sides of the Israeli–Palestinian Conflict: A Cross-Cultural Approach', *Applied Psychology* 58.4 (2009), 688–708.

indicated that during their time in the chorus, their social bonding and perception of chorus members from the 'other side' increased. In addition, participants reported improvements in social behaviours, such as empathic abilities and the capacity to navigate complexity during their time in the chorus. Further, participants rated the music elements of the chorus as being more important than the dialogue elements in terms of their changes in social bonding, while they rated the dialogue elements as being more important than the music elements in terms of their changes in social perception. The tentative conclusion is that side-by-side singing and face-to-face dialogue can enhance how Jewish-Israelis and Arab-Palestinians perceive and interact with one another. This study needs to be replicated on a larger scale and with more complex designs, including randomisation. In addition, this research should be expanded to include participants who are exclusively religious, including more right-wing segments of each religion who are more reluctant to engage with the 'other side'.

(c) God in the Brain

The programme's findings to date have established individual and group-level associations between music and spirituality. Music appears to serve at least two primary functions in spiritual contexts: (1) to facilitate a sense of communal bonding and (2) to be a vehicle for self-transcendent and divine experiences. A crucial next step for this research is to examine the relationship between music and spirituality at the level of the brain. Similar to psychological science, neuroscience lacks research on the links between music and spirituality. The closest volume of research is the neurobiology of chanting based on electroencephalogram (EEG) and functional magnetic resonance imaging (fMRI) studies, primarily conducted by Gao and colleagues.[44] The findings suggest that

44 Junling Gao et al., 'Repetitive Religious Chanting Invokes Positive Emotional Schema to Counterbalance Fear: A Multi-Modal Functional and Structural MRI Study', *Frontiers in Behavioral Neuroscience* 14 (2020), 548856; Junling Gao et al., 'Repetitive Religious Chanting Modulates the Late-Stage Brain Response to Fear- and Stress-Provoking Pictures', *Frontiers in Psychology* 7 (2017), 2055; Junling Gao, Hang Kin Leung, Bonnie Wai Yan Wu, Stavros Skouras, and Hin Hung Sik, 'The Neurophysiological Correlates of Religious Chanting', *Scientific Reports* 9.1 (2019), 4262.

the neurophysiological correlates of religious chanting differ from those of meditation and prayer; consequently, religious chanting may induce distinct psychotherapeutic effects.[45] If music serves the dual purpose of facilitating transcendent experience and social connection, it will be crucial to distinguish the context in which spiritual and secular music is performed. Is it utilised for worship or other purposes? Furthermore, is it employed singularly or in combination? Based on prior research from brain studies during meditation, we might hypothesise that the default brain network is involved, and based on prior research on social neuroscience, we may hypothesise that oxytocinergic and dopaminergic pathways, along with brain regions responsible for reward and motivation, may also be at play.[46]

Conclusion

Some of the most influential and renowned musicians of the past century (such as John Coltrane and The Beatles), including those who were not explicitly religious (such as Leonard Cohen), used music in their own search for life's meaning and spiritual growth. Coltrane, in particular, exemplifies this, integrating his artistry with spirituality to impact not just the realm of music, but also political and socio-cultural issues of his time. Coltrane said:

> The true powers of music are still unknown. To be able to control them must be, I believe, the goal of every musician. I'm passionate about understanding these forces. I would like to provoke reactions in the listeners to my music, to create a real atmosphere. It's in that direction that I want to commit myself and to go as far as possible.[47]

These were the directives that Coltrane gave to current and future generations of musicians. Through Coltrane's music and well-known rigorous work ethic, this sentiment has served as an anthem for subsequent generations of musicians. I contend that these words from

45 Gao et al., 'The Neurophysiological Correlates of Religious Chanting', 4262.

46 Britta K. Hölzel et al., 'How Does Mindfulness Meditation Work? Proposing Mechanisms of Action from a Conceptual and Neural Perspective', *Perspectives on Psychological Science* 6.6 (2011), 537–59; Greenberg et al., 'The Social Neuroscience of Music', 1172–85.

47 As quoted in DeVito, *Coltrane on Coltrane*.

Coltrane should also be the directors for current and future researchers in not just music and spirituality, but in the music sciences more generally. To discover the most profound abilities and effects that music has and can have, researchers must be willing to delve into the innermost recesses of the human mind. This begins with the study of music and spirituality, which I believe to be the key to unlocking new possibilities regarding the function of music in individuals and society.