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TRANSLATIONAL RESEARCH IN MUSICVALERIE ROSS¹**ABSTRACT**

Music allows itself to be melded, translated, and transformed. A translational music researcher is a creative investigator who explores and develops appropriate research approaches and processes and engages multidisciplinary teams in an integrated manner (often applying and co-creating outputs from scientific, technological, and artistic realms). This article extrapolates the features and characteristics of translational research in the field of music. Translational research applies findings from basic science to enhance human health and wellbeing through the pooling of resources, expertise, and techniques. While translational research has gained momentum in the social sciences and humanities, the understanding and application of this approach in the creative arts is still in its infancy. Translational music research builds on interdisciplinarity. Making reference to two interdisciplinary music studies, this article argues that music is inherently translational and facilitates transference. It proposes translational research in music as an extension of interdisciplinary research with an aim to produce creative outputs that are targeted to enhance community-wellness and the wellbeing of identified groups.

Key Words : Translational music research, interdisciplinarity, transference, health and wellbeing

BACKGROUND AND DEFINITIONS

Translational research essentially applies findings from basic science to enhance human health and wellbeing. A term used since the 1990s in the field of medicine to denote interdisciplinary research, translational research combines multiple resources, disciplines, and expertise to promote development in prevention, diagnosis, and therapeutic interventions by “translating” fundamental research into medical practice and health outcomes (Cohrs et al., 2015; Woolf, 2008). The US National Institute of Health defines translational research as the process of applying ideas, insights, and discoveries generated through basic scientific inquiry to the treatment or prevention of human disease, thus bridging the gap between scientific discoveries and their application to improve the quality of life in the community (Brekke et al., 2007; Davidson, 2011).

Rubio et al. (2010) posit that translational research is a challenge as it moves in a bidirectional manner from one type of research to another – from basic research to patient-oriented research, to population-based research, and back (bench to bed and back). Since this form of research involves expertise from diverse disciplines, Rubio further opines that translational training programmes should include a combination of multiple skills training that are not usually taught together in traditional training programmes, complete with predetermined learning outcomes to meet the different needs of the trainees.

The arena of translational research has since expanded, and one of the growing areas of translational research is to examine how developments and innovations in science are influencing and being influenced by arts and culture. A better understanding of the interconnectivity and complementarity interpolation between the arts and sciences will expand creative avenues for interdisciplinary and transdisciplinary research. It further opens

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questions on the roles and significance of culture, imagination and creativities particularly in scientific enquiry that address societal issues, public engagement, and human wellbeing.

TRANSLATIONAL RESEARCH IN THE ARTS AND HUMANITIES

Identifying the importance of both individual and collective determinants of health, Ogilvie et al. (2009) offered a framework that redefined the objective of translation that incorporates epidemiological perspectives with those of the social sciences. The UK Arts and Humanities Research Council promotes research in “translating cultures”, which aims to engage with key concepts such as multiculturalism, tolerance, and fostering identity. It encourages studies on the roles of intermediaries and views performances and cultural artefacts as vehicles of translation. It interrogates translational practices in its cultural and historical perspectives in developing knowledge of the nature of translation that occurs in different languages, cultures, generations, and sectors. It seeks input from an arts and humanities perspective in key areas of public concern such as education, health and wellbeing by informing the work of policy makers and public, private, and third-sector organisations (Arts and Humanities Research Council, 2017).

Encouraging diverse conceptual, theoretical, and methodological approaches, the themes aim to address research questions relating to a range of historical contexts and within a variety of geographical locations. Therefore, systems of knowledge acquired from a sophisticated understanding of cultural value, practice, and belief systems serve to inform and support developmental input in ethical, legal, and regulatory policies that scientific approaches alone may not adequately answer; hence the potential of collaborative research in widening translational pathways between the sciences and the arts and humanities, as well as how translational outcomes may be applied in society represent distinctive features of translational research in generating new knowledge of human life.

Translational research in the arts and humanities is naturally interdisciplinary in nature and aims to develop a better understanding of the ways in which the findings of scientific (and artistic) research can be applied to improve the health and wellbeing of a society and its community (Butler, 2008). Translational research in the creative arts serves to produce new knowledge about the human condition through the application of creative practices to address real-world problems in learning and development. The incorporation of music will further serve to facilitate and enhance the translation of complex research into the public realm. The understanding, approach, and application of translational research in the field of creative arts are in their infancy, more so in the field of music research.

FROM INTERDISCIPLINARY TO TRANSLATIONAL MUSIC RESEARCH

Interdisciplinary and intercultural music research approaches involve a process of collaborative engagement between researchers from different disciplines with the aim of better understanding ways in which knowledge is produced, transformed, and shared. Multiple research approaches encourage a cross-fertilisation of art-science practices, integrating information, data, theories, techniques, and tools (Ross, 2016). Interdisciplinary conferences and opportunities for cross-discipline publications are becoming the new norm in the 21st century. Periodicals such as the *Journal of Interdisciplinary Music Studies* provide a broad interdisciplinary platform for music researchers to share knowledge, promote it as inter- and cross-disciplinary research, and effect its application between sciences and the humanities, bridging the gap between musical theory, practice, and disciplines.

Interdisciplinarity manifests itself differently in multiple disciplinary contexts. It is a means towards attaining deeper insights and problem-solving to achieve a better life in a complex and rapidly innovating society. It contributes to a balance between the breadth, depth, and cohesiveness of specialised research and practice within and across disciplines.

The biennial “Building intercultural and interdisciplinary bridges across cultures and creativities (BIBACC)” conferences explore research, theory, and practice that connect issues of interdisciplinarity and interculturality, challenging and problematising its meaning and approaches to further theoretical, empirical, and practical understanding of these transformative terms (Burnard et al., 2017).

Translational music research builds on interdisciplinarity. It embraces the tenets of interdisciplinary research approaches, extending and translating meanings, narratives, and output to targeted groups and communities. Engaging inter- and multidisciplinary skills, a translational music researcher is a creative investigator who plans and develops different research approaches and processes, managing multidisciplinary teams in an integrated manner (often applying and co-creating outputs from scientific, technological, and musical/artistic realms). By this definition, and in many ways, the aims and output of music therapy and rehabilitation, and the work of music therapists with occupational therapists, are innately “translational”. Music allows itself to be melded, translated, and transformed. Developments in the field of music therapy bear testament to music’s translational roles (Thompson and Schlaug, 2015). The Oxford Handbook of Music Therapy (ed. Edwards, 2016) elucidates five specific areas in which music therapy functions: (i) contexts and populations across lifespans; (ii) models and approaches; (iii) methods; (iv) research; and (v) training and professional issues. Stige (2002) argues for a culture-centred form of music therapy, a developing orientation within the discipline and practice of music therapy that enlightens how humans develop their capacities through participation in society, positing community music therapy as cultural engagement and “health musicking”. Different notions of culture have shaped contemporary thought on the therapeutic qualities of music. From the specialist music therapist to the ritualistic practices of tribal cultures, music has found its own space, sphere, and communal acceptance through time. In this sense, culture operates as a resource, trigger, and spur for action rather than merely influencing behaviour. Culture shapes human interaction, attitude, and creativity. Music personifies, accompanies, and identifies many rituals of culture. Translational music research aims to provide a scientific understanding of cultural practices.

TRANSLATIONAL QUALITIES OF MUSIC

Music and medicine has often been associated. As far back as 1983, Alice Brandfonbrener organised the first conference on medical problems of musicians in Aspen, Colorado, co-directing them for the next 20 years, and further founded the first journal in this field, *Medical Problems of Performing Artists* (Lederman, 2014). Ackermann (2016) argues that there is yet a robust base of evidence to draw from within the complex range of physical and psychological challenges that can affect performer health in the relatively young field of performing arts medicine. Translational research in the performing arts-science domain is gaining momentum. A Translational Hearing Research Summit organised by the University College London-Ear Institute (22 March 2018) brings together academia, industry, investors, clinicians, and patients to discuss strategies to accelerate the development of pharmaceutical and biological treatments for hearing loss and tinnitus. The interpolation of multiple disciplines in translational music research necessitates the translation of knowledge and practices from the design and development of new epistemologies for collaborative research between music, health, and wellness practitioners.

Two studies are presented to demonstrate the translational qualities of music. The former does so in a clinical-scientific setting, the latter in a social setting. They serve to illustrate the transformative capabilities of music in translational music research that encompasses inter- and multidisciplinary modes of approach, design, and collaborative engagement in fostering wellbeing.

Case Study 1: Music for Sensory Integration Therapy

The first study illuminates the creation of original compositions and soundscapes for use by occupational therapists during sensory integration, a therapy based on brain-behaviour theory developed by occupational therapist, Dr Jane Ayre (1972). Children with lower sensitivity (hyposensitivity) may be exposed to play that stimulates the senses, while children with heightened sensitivity (hypersensitivity) may be exposed to more gentle activities. Figure 1 illustrates occupational therapists working in a sensory integration room during clinical sessions for children with autism spectrum disorder.

FIGURE 1 Sensory Integration Therapy in Session



(Original image taken by Ross, 2017)

In this study, four distinctive sensory integration techniques (bouncing, rocking, brushing, and joint compression) used in the therapy sessions were translated into rhythmic patterns, melodic shapes, and textural moulding by the writer-composer, and composed through musical hubs (Ross, 2017). A practice-led approach was adopted. Situating the creative output as an artefact of research, the reciprocal relationships between the practice of the occupational therapist in engaging with sensory integration techniques to support slow vestibular stimulation and the translation of such motions as musical patterns with sonic landscapes were devised and synchronised with the sensory therapy motions. A salient comment by the occupational therapist in the study was as follows:

“I was quite surprised as the children seemed captivated by the sounds and were more responsive to the therapy, as if they knew the coming parts of the vestibular actions after a few sessions with the accompanying music. I had one child who offered his hand for joint compression when the music was used – normally he is hesitant. ... Personally, the music has helped my work. ... Sometimes I have to chase the kids but now I can even wear my *baju kurung* [traditional Malay dress] during the sessions instead of wearing pants, as I don’t have to run around!” (Hanizah, M., personal interview, 1 March 2016)

Such comments illustrate the positive effects of music on audiation, a cognitive process by which the brain gives meaning to musical sounds (Gordon, 2001). Music sends electrical signals to the brains through the auditory system securing neural attention and sensory response. Neurological studies have proven the scientific role of music and its effects on the brain (Schlaug, 2006; Ross et al., 2014; Tierney and Kraus, 2015). In the above example, the music created engaged the attention of both client and therapist, signalling its translational powers in fostering awareness, engagement, collaboration, and wellness.

Case Study 2: The translational qualities of ritual music

The second study examined the symbolic roles, types, and qualities of music played during trance-inducing ceremonies for devotees during Thaipusam, a yearly Hindu festival in Malaysia that attracts huge numbers of followers and spectators. Spectacular sights of devotees carrying magnificent decorative structures called *kavadi* with ornate (and sometimes gruesome) body piercings have captured the imagination of the public (ABC News, 2016).

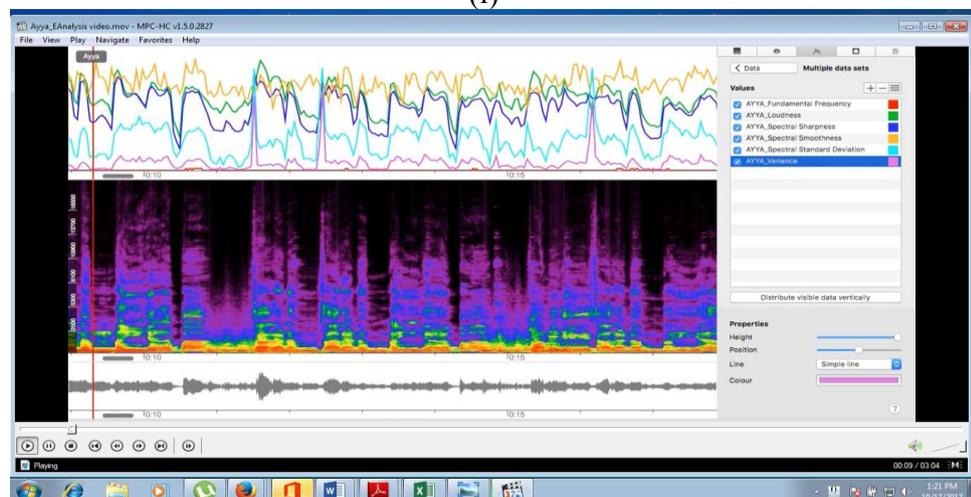
While the trance state of devotees is often visibly reflected in the demeanour of the *kavadi* carriers, less is known about the music that is played in rituals that support the psychological and spiritual transition towards reaching this “altered state”. This study postulates that music facilitates extra-musical associations and acts as an agent for audiation in assisting devotees enter into a trance state (Fadzil, Ross and Azizol, 2016). When the musicians were interviewed about what roles they thought the music played in the trance ceremonies, the leader of the *Sri Muthappan Urumi Melam* ensemble replied:

“We work as a group to support the devotees, we and they must believe in it. ... My instrument is very sacred to me; when I play it, the sound comes alive as if it is the Lord speaking through it. ... We have even being invited to India to perform, as this kind of ritual is no longer allowed there, and they want to know the pieces we play and the instruments we use.” (Murthi, K., personal interview, 4 April 2016)

Audio recordings of the pieces were transcribed, and spectrograms of the recordings were analysed by the writer using e-analysis software (Couprie, 2014). Figure 2 illustrates the opening bars of *AYYA*, one of the five commonly-played pieces during the trance inducement ceremony, together with its spectrogram measuring its sonic features (loudness, spectral sharpness, spectral smoothness, spectral standard deviation, variance). The vocal line was a devotional song rendered in Tamil and accompanied by four Indian percussion instruments (*pambai*, *urumi*, *tavil*, *jalra*).

FIGURE 2 (I) Score Transcription and (II) Spectrogram of the Opening Bars of *Ayya*

(i)



(ii)

Musical analyses facilitate a better understanding of the form, structure, melodic, and rhythmic features of music used in trance induction. Delineating its sonic spectrum using digital audio-visual software further enabled advanced acoustical analysis and future replication of such music leading towards the demystification and heightened scientific understanding of the performative and acoustical qualities of ritual music.

Cultural associations that accompany the music play an important role in stimulating a trance experience and facilitating trance induction (Aldridge and Fachner, 2006; Beng-Yeong, 2000). In this article, it is further argued that ritual music has facilitated “transference”, a psychological phenomenon characterised by the unconscious redirection and projection of emotions and feelings from one person to another (Freudian theory). Once the “projections” are recognised, a particular form of rapport and emotional bond, or transference, is achieved between individuals (such as a therapist and the patient), creating a sphere or structures of “collective unconsciousness” (Jungian theory). Building on psychoanalysis theories, the sound of Hindu devotional songs and the rhythmic pulsations of accompanying traditional Indian drums played by specialist *kavadi* ensembles appeared to have induced evocation, stimulating audiation through continuous mental hearing and translation, thereby assisting the devotees to attain spiritual transcendence in fulfilling their vows. The translational powers of music have enabled a passage towards a feeling of fulfilment among devotees and a sense of spiritual wellbeing enjoyed by the musicians.

CONCLUSION AND WAY FORWARD

Although the two selected case studies represent different dimensions of and different approaches to research, they both demonstrate how an integrated design to the conduct and theorising of interdisciplinary music research supports translational outcomes that benefit the community it serves. Creative applications of music in interdisciplinary experimental and cultural contexts can facilitate and hone human wellbeing by harnessing translational qualities. In both cases, the sound of music has triggered audiation, an internal realisation of the meaning of music which enabled intrinsic and extrinsic response among its community.

The study also demonstrates the need to develop standardised methods and a framework for capturing, analysing, and replicating research outputs that allow expert investigators to reproduce their superior performance in the laboratory (Ericsson and Williams, 2007). Proponents for translational research recommend that researchers identify treatments that are effective in everyday life and then attempt to bring them into the laboratory. Translational research can “help identify not only what works in psychotherapy but also how it produces beneficial results” (Vernig, 2007, p. 29). State support for translational research seeks studies which demonstrate how everyday phenomena such as successful clinical treatments and expert achievement can be reproduced in the laboratory and conversely how highly skilled performance studies of these phenomena in the laboratory can lead to positive interventions in everyday life (Sabarinah, 2013; Ericsson, 2006b).

In conclusion, this article has extrapolated features and characteristics of translational music research. It has examined the background to and definitions of translational research. It has highlighted developments in translational research in the art and humanities, and proposed translational research in music as an extension of interdisciplinary research with an aim to produce creative outputs that are targeted to enhance community-wellness and the wellbeing of specific groups. It has drawn case examples from two interdisciplinary music studies using different methodological approaches, the first under a clinical environment and the second in a social setting. It has illustrated how music enables audiation and transference in internalising comprehension, redirecting, and translating meaning into positive actions. It advocates mutual exchanges between the sciences and the arts in developing new frameworks to capture, analyse, and reproduce superior performance in the laboratory and in the

community. Finally, it has posited that music possesses translational qualities which can be (re)applied or practised in targeted environments with a need to identify public benefits that accrue from collaborative research practices within and across disciplines in promoting health, wellness, and wellbeing through multidisciplinary translational research in music. Translational music research fosters the multidirectional and integration of basic research. Further interdisciplinary studies to better understand the translational qualities of music will undoubtedly yield outcomes that can be effectively applied in therapeutic and health-care services that benefit society generally, and underprivileged communities specifically.

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