Music and Anthropogenic Climate Change: An Evolutionary Perspective

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Abstract: Anthropogenic climate change (i.e., climate change generated by human activities) requires solutions that are grounded in both thoughtful analysis and emotional responses, promoting the creation of social bonding and the development of a common desire to implement changes in our personal lives and society at large. In this article, I use a biopsychosocial approach – an approach that takes into account biological, psychological, and socio-environmental factors – to study the role of music in eliciting emotions and enhancing social bonding. This approach will allow me to contextualize the role of music within the findings of current evolutionary theories of music, that is music theories that study the evolutionary function of music and show that music’s ability to unite people in the fight against climate change stems from its evolutionary role as a survival mechanism.

Keywords: Climate change; evolutionary theories; music; social bonding.

Music composed to raise awareness about anthropogenic climate change, that is human-caused climate change, is not limited to a specific music genre; in fact, music of all types and forms has been used to raise such awareness – from jazz to religious music, rap, and opera. In 2019, the band COPUS performed a new jazz and spoken-word composition entitled “What if we…?” during the GFDRR and World Bank Group’s The Art of Resilience programme. The programme brought together a cast of artists and scientists from across the world to demonstrate how art can play an influential role alongside science to support disaster relief efforts and help diminish the impact of climate change.\(^2\) The opera CO\(_2\) with music by Giorgio Battistelli and libretto by Ian Burton, first staged at La Scala, Milan, in 2015, is yet another example of how music for climate change has been inclusive in its selection of music genres and traditions from across the globe. CO\(_2\) is an opera that portrays the effects of greenhouse gases on the earth’s atmosphere, and specifically “deals with the difficult relationship, maybe of love, of drama, of jealousy, of abuse, between mankind and nature, between humankind and its own environment.”\(^3\)

The core message of these artistic projects, like that of many other music-related initiatives meant to raise awareness about climate change, has spread widely, predominantly thanks to the development of digital platforms, which allow artists to convey social messages across the globe quickly and efficiently. In the past two decades, the increasing adoption of digital platforms has created a thriving network of new cultural and research initiatives that include, among others, discussions about the relationship between cli-

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1. As a study centered on human activities (e.g., music making) and behavior (e.g., social gatherings), this article focuses exclusively on issues related to anthropogenic climate change. Effects of these changes on non-human life forms are beyond the scope and focus of this paper. Moreover, in this paper I use the term climate change to indicate anthropogenic climate change. I would like to thank Afra Saskia Tucker for her help with the editing of this paper.
climate change and music, collaborations between music and science, and music-related initiatives explicitly designed to lower CO₂ emissions. These include the organization of numerous TEDx talks focused on the relationship between music and climate change; the creation of websites such as https://climatemusic.org, which aims at fostering the “creation and staging of science-guided music and visual experiences to inspire people to engage actively on the issue of climate change;” and the growth of initiatives such as the implementation plans put forth by the Tyndall Centre for Climate Change Research at the University of Manchester to create concert tours producing the lowest possible amount of carbon emissions.

Amidst this complex panorama of initiatives and creativity, the role of music remains central in raising awareness about, producing emotional responses to, and generating social bonding around climate change-related issues. The integration of emotional and cognitive feedback generates a rich, unified embodied experience that, in turn, contributes to engaging social bonding mechanisms that inspire us to organize and unite in the common mission for a healthier planet, and, ultimately, a healthier human population, both current and future. In other words, the fight against human-produced climate change is driven by survival urges, and music provides a powerful social bonding catalyst rooted in emotional responses, cognitive mechanisms, and neurobiological processes that contribute to drive the creation and maintenance of those social bonds. But how does music achieve all this?

By focusing on examples of music that have been specifically composed, digitally generated, and creatively adapted to raise awareness about climate change, I will: (1) study the role of music as an emotional conduit of semantic messages and explore the function of both lyrics and music as generators of social bonding; (2) investigate the experiential aspect of music listening from a biopsychosocial perspective; and (3) contextualize music’s social bonding function within the larger framework of evolutionary theories of music, especially the theories of social cohesion and group effort.

To summarize, this article will examine the role of both vocal and non-vocal music in raising awareness about and fighting climate change and show how words and music blend in an extended form of metaphor to generate complex embodied cognitive and emotional experiences. I will also explore the biological and psychological underpinnings of that embodied experience and describe how those elements interact to generate social bonds that ultimately bring people to act together for the common purpose of saving their habitat. Finally, this article will discuss how a biopsychosocial view of music and group synergy can be seen as part of an evolutionary process wherein music occupies a core position. In the concluding section, I will summarize the findings of the paper, and propose some ideas for further research on the topic of music for climate change within the context of biopsychosocial and evolutionary approaches.

Music as a Messenger

In 2002, Lawrence Zbikowski published a seminal book entitled Conceptualizing Music: Cognitive Structure, Theory, and Analysis. In the second chapter, entitled “Cross-Domain Mapping,” Zbikowski de-

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6. A biopsychosocial perspective is an interdisciplinary perspective that examines issues through the integrated study of biological, psychological, and socio-environmental aspects.
7. Social cohesion refers to group solidarity generated and maintained through the promotion of altruism, thereby increasing the efficacy of group actions against potential dangers (e.g., climate change). Group effort, on the other hand, refers to the coordination of work within a group to achieve a common goal (e.g., coordinated efforts to diminish the threat of climate change).
fines cross-domain mapping as the process that underlies conceptual metaphors. This form of mapping is fundamental to cognitive processing, and therefore, for understanding its creative outputs. Furthermore, Zbikowski shows that cross-domain mapping is the process through which we interpret both text painting (i.e., a compositional technique aiming at representing through music specific images elicited by words) and program music (i.e., music based on an extra-musical narrative). He explains that text painting and program music are two examples of how cross-domain mapping can lead to conceptual blending, an extended form of metaphor in which elements from two related domains blend to create an integrated emotional-cognitive output. For instance, the earth’s rising temperatures can be described by the use of a rising music scale in such a way as to project the concept of “rising” common to both temperature and musical scale onto a third domain, to produce an emergent and “rich set of possibilities for the imagination” such as a sense of worry and urgency about the planet’s state. Within this context, the integration of musical patterns and consequential outcomes of climate change produce a rich, embodied experience, which is grounded in both physiological and psychological responses that, as I will show in the next sections, underlie and contribute to shaping social bonding among individuals. In the next paragraphs, I will investigate both cognitive and emotional aspects of this embodied experience with respect to both vocal and non-vocal music, each of which presents specific and distinct features in terms of how cognitive mechanisms and emotional response are expressed.

Music-based events related to climate change broadly revolve around two types of music, vocal and non-vocal, both of which play an important role in raising awareness about climate change. Songs, which are characterized by the presence of lyrics and are almost always coupled to an instrumental or digitally generated accompaniment, are the most popular type of music compositions used by artists to convey messages about climate change. Songs are effective means of communication for a number of reasons. Lyrics can be readily understood and, therefore, used to spread messages related to climate change across large segments of the population. Examples of how lyrics are used in climate change-related music include Jamiroquai’s 1993 “When you gonna learn,” from his debut album Emergency on Planet Earth, addresses the effects of apathy in the fight against environmental issues with lines such as “We gotta wake this world up from its sleep,” and the impact of greed with lines such as “Greedy men been killing all the life there ever was.” Furthermore, Neil Young and Crazy Horse’s “Mother Earth (natural anthem)” from their album Ragged Glory, talks about the relationship between humans and the planet, raising questions such as “How long can you/Give and not receive/And feed this world/Ruled by greed?” Moreover, alternative rock singer Thom Yorke, the main vocalist of Radiohead, has frequently written about climate change, with songs such as “Idiotæque,” from the band’s 2000 album Kid A, which warns listeners that “Ice age coming/Throw it in the fire” and that “We’re not scaremongering/This is really happening.” All those (and many other) songs remind us of what may happen if we do not take immediate action against the current degeneration of the conditions that make the planet hospitable to human life.

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8. That is the mapping of a concept from one area of interest, such as linguistics, to another, such as music. See Lawrence M. Zbikowski, Conceptualizing Music: Cognitive Structure, Theory, and Analysis (Oxford: Oxford University Press, 2002), 63–95.
Furthermore, the coupling of music and lyrics in songs contributes to listeners’ ability to retain novel words and phrases. This has been known intuitively since, at least, the Middle Ages. In her book *Medieval Music and the Art of Memory*, Anna Maria Busse Berger discusses how the coupling of music and words was used to create music-textual formulae designed to assist in the process of memorizing long liturgical texts and complex melodic patterns. More recently, studies in the field of memory research have confirmed that the coupling of words and music does indeed produce significant effects. Jakke Tamminen & al. have shown that new words that are learned through singing are more significantly integrated in the subject’s vocabulary than words that are learned through speaking. Furthermore, research has demonstrated the effects of music on social behaviour, and found that “lyrics may have an effect on prosocial cognition and emotion,” thus potentially promoting shared experiences among people (in our case, uniting individuals in the cause of ending unrestrained anthropogenic climate change).

Although songs are particularly powerful means for communicating and promoting awareness about climate change, they are not the only means by which music can generate such awareness; instrumental and/or digitally generated music can also produce similar results. Non-vocal music cannot rely on language to communicate its intended subject; instead, it must use external sources such as data or ideas related to the topic to convey its message. Non-vocal music employs two main strategies to achieve this. First, composers may take a set of data that provides information about climate change, for instance the rising temperature of the earth, and portray the data points as a musical pattern, for instance through the use of an ascending musical scale. This technique is analogous to what I defined earlier as text painting, which also uses a set of data to communicate the target concept. Second, music can be used to describe an extra-musical narrative; for example, composers can use crescendos and increasingly faster tempos to describe emotions and feelings of urgency related to textual descriptions of how climate change can negatively impact our lives. This strategy is referred to as “programmatic” because it uses music to convey an extra-musical programme, or narrative. Text painting and program music appear to be similar, as they both use music to describe extra-musical elements. However, the former usually operates at a more focused level (i.e., a component of the composition will be representative of or describing a specific word, or data set pattern), while the latter functions on a more general level (i.e., an entire section of a piece, or pieces in their entirety, are meant to describe the extra-musical narrative). The following three examples illustrate how the mapping of non-musical narratives onto music has been used to promote awareness about climate change.

The 2020 Beethoven Pastoral Project was a worldwide initiative created to both raise awareness about climate change and celebrate Ludwig van Beethoven’s 250th birth anniversary. The project consisted in staging multiple performances of Beethoven’s programmatic Pastoral symphony, a work composed in 1808 and originally conceived as a Romantic ode to nature, and now reinterpreted as a symbol of climate protection. In 2019, Adam Schoenberg composed Losing Earth, a concerto for solo percussion and

orchestra\textsuperscript{20} meant to raise awareness about climate change. Schoenberg’s description of this composition is particularly informative of the thought process through which the composer coupled information about climate change and its rendition through music:

Rhythmic breaks represent the natural occurrences and/or disasters that are affecting our cities and towns on a daily basis. [...] After the march-like section comes to a screeching halt, we enter the second section of the piece, which represents the inevitable loss of our beloved coastline. With our sea levels quickly rising, will the majority of this land be under water in a couple of decades? [...] I wanted to create a movement that captured what it would be like if Mother Nature reclaimed our beaches, and we all simply faded into the ocean. The vibraphone sets up a slow, oscillating world that is meant to reflect a sense of being underwater. This is a very atmospheric and dreamy section, featuring multiple string divisions and gentle winds and brass. As the second section comes to an end, a dark texture slowly emerges and helps transition us to the third and final section of the concerto. This represents the imminent call to action that is needed in order to try and save our world. We’ve already lost so much time, but if we have any hope of repairing what exists, then we must take immediate action. Section three is the “scherzo” of the concerto and is super fast, featuring highly virtuosic mallet writing with simultaneous kick drum, temple blocks, granite blocks, and other wood and metal. The music is both relentless and aggressive. But like all of my music, I strive to create a sense of hope and optimism towards the end.\textsuperscript{21}

Finally, some of the most recent compositional experiments include music written using digital platforms. \textit{Climate symphony}\textsuperscript{22} by Jamie Perera integrates newly composed instrumental music and climate research data sets that help to map out the progression of some of the climatic changes of the past decades. Combining data about climate change taken from field recordings with instrumental and digitally composed music, Perera offers “sonic interpretations” of the original data to inspire dialogue and raise awareness about the effects of climate change across a variety of communities, creating a repertoire of compelling stories about the people most affected by the climate crisis.\textsuperscript{23}

Ultimately, both vocal and non-vocal music have been successful in catching the attention of media, artists, activists, and listeners. This success has been made possible because of their ability to convey (i.e., carry, transfer) and communicate (i.e., share, exchange) information. Music can effectively contribute to convey pre-existing messages through its role as a component of conceptual metaphors and elicitor of a wide range of emotions; vocal music can communicate, through its linguistic text, novel semantic content.\textsuperscript{24} Both vocal and non-vocal music are successful experiential phenomena and influential catalysts in the fight against climate change; the former as an effective means of capturing and channeling the attention of listeners towards those ideas; the latter as it employs the power of words to disseminate ideas.

In the next section, I will show how the ability of music to channel people’s emotions is determined by the interaction of a complex series of biological factors, psychological responses, and social elements that can be studied from a biopsychosocial perspective – an interdisciplinary perspective that looks at the

\textsuperscript{21} Adam Schoenberg, programme notes for the San Francisco Symphony Orchestra, 2019, accessed March 25, 2020, \url{https://www.sfsymphony.org/Data/Event-Data/Program-Notes/A/Adam-Schoenberg-Losing-Earth}.
\textsuperscript{22} Jamie Perera, “Climate Symphony;” accessed March 25, 2020, \url{https://www.jamieperera.com/climate-symphony}.
\textsuperscript{23} Jamie Perera, “Climate Symphony.”
interaction of biological, psychological, and socio-environmental factors. Furthermore, following current evolutionary theories of music – theories that aim at studying the evolutionary function of music – I will contextualize these findings within the broader understanding of how music functions as a survival mechanism.

An Evolutionary Perspective on Music

Solutions to the climate change crisis require: (1) a cognitive understanding of the issue; (2) an emotional response to the problem; and (3) the desire to improve the situation for the good of everyone. Humans possess all the cognitive abilities that would allow us to accomplish this, as we can both understand the risks of uncontrolled climate changes and act accordingly to model, predict, and find solutions to those problems. Many of us also appear to produce adequate emotional responses to the problems caused by climate change. And yet, as a group we do not seem able to effectively coordinate our efforts, take action, and implement any long-term and meaningful solutions. This inability to act is frequently understood and construed as the result of self-interest and greed, that is the pursuit of short-term, self-directed advantages that pushes organizations and individuals to prioritize growth and profitability over all other considerations. However, self-interest and greed are themselves caused by the absence of concern towards the suffering of others (compassion), and by the inability to understand and share the feelings of others (empathy). As the Dalai Lama notes:

We experience a sense of closeness toward people who are dear to us. We feel a sense of compassion and empathy for them. We also have strong love for these people, but often this love or compassion is grounded in self-referential considerations: “So-and-so is my friend,” “my spouse,” “my child,” and so on. What happens with this kind of love or compassion, which may be strong, is that it is tinged with attachment because it involves self-referential considerations. Once there is attachment there is also the potential for anger and hatred to arise. Attachment goes hand in hand with anger and hatred. For example, if one’s compassion toward someone is tinged with attachment, it can easily turn into its emotional opposite due to the slightest incident. Then instead of wishing that person to be happy, you might wish that person to be miserable. True compassion and love in the context of training of the mind is based on the simple recognition that others, just like me, naturally aspire to be happy and to overcome suffering, and that others, just like myself, have the natural right to fulfill that basic aspiration. The empathy you develop toward a person based on recognition of this basic fact is universal compassion.25

What the Dalai Lama calls universal compassion is the ultimate form of compassion, developed through empathy as the necessary precondition of caring behaviors towards others. Ultimately, empathy and universal compassion are crucial for creating a more caring society, as they connect and integrate our cognitive understanding of the world that surrounds us with altruistic actions. In other words, according to this perspective, by increasing the general level of empathy in the population we can increase the level of universal compassion and the quality of social bonding crucial for achieving our common goals. One of these common goals is, or should be, the pressing need for an answer to the climate change crisis, whose solution would be beneficial not only to us presently, but also to future generations to ensure the survival of our species. But what is the biopsychosocial evidence that music can play a significant role as a mediator in the creation of empathy and compassion, and ultimately, motivating us to secure a better ecological existence for humanity?

Ian Cross suggests that music can generate empathy and foster group cohesion and affiliation as an evolutionary adaptive mechanism. According to Cross, music’s evolutionary adaptive role might be related to its ability to be “risk-free and indeterminate in meaning,” allowing members of groups to freely interact and share experiences even though they might not share the same goals and outlooks on problems, and to form and nurture either real or imagined relationships. In other words, music eases social interactions, providing a common and safe platform for people to share their experiences. Similarly, Alan Harvey suggests that, from the onset, one of the many purposes of music was to “promote emotional synergy, social bonding, and foster group-level cooperation and coordination in early human evolution.”

Steven Mithen further corroborates Harvey’s theory by stipulating that music served the function of promoting social cohesion in our prehistoric ancestors. Finally, in his chapter “Is music an evolutionary adaptation?” David Huron lists social cohesion (i.e., the formation and maintenance of group unity and solidarity) and group effort (i.e., the effort of each member in achieving a specific goal as a group) among the eight currently accepted broad theories of music evolution.

To summarize, music does have the ability to elicit empathy and social bonding, which might be a manifestation of music’s evolutionary function as a generator of both group cohesion and group effort. However, a question remains regarding the evidence for the claim that music is indeed an evolutionary mechanism meant to foster social synergy. In this respect, Huron lists four types of evidence to support a possible evolutionary basis for music: genetic, neurological, ethological, and archaeological. Genetic evidence describes the possibility of genetic heritability of musical abilities. For example, Siamak Baharloo suggests a genetic component contributes to absolute pitch, and Yi Tan indicated a possible contribution of specific genes to singing abilities, music perception, and music memory.

Neurological evidence addresses the possible existence of brain structures specifically configured for the processing of music. Patrik Vuilleumier suggests that music, similar to language, might produce meaning and emotions through the activity of mirror neurons, and states that “emotions emerge through a combination of activation in emotional and motivational brain systems […] and in motor, attention, or

30. Huron, 2003. The eight theories are: mate selection, social cohesion, group effort, perceptual development, motor skill development, conflict reduction, safety time passing, and transgenerational communication.
33. We know that a certain type of neuron called mirror neurons are activated in the brain of a person who is observing another perform an action. These neurons are thought to be responsible for learning how to perform an action without having to perform the action itself, or, as an extension, to understand and acquire emotional responses through observation. As a result, the human mirror neuron system may explain music’s ability to generate emotional contagion, as it produces an anticipatory form of motor-simulation of both auditory and movement features related to music production (e.g., sounds and facial expressions) resembling vocal and motor representations of emotions, and voluntary motor actions meant to produce sounds.
memory-related regions.”

The engagement of both emotional and motivational brain systems, including reward pathways, are modulated by the presence and action of dopamine, a neurotransmitter that is involved in, among other things, the functioning of the reward centers of the brain, our subjective appreciation of music and, like oxytocin, social bonding. Ethological evidence concerns the possible existence of behavioral and socio-organizational cues related to music. David Huron shows that ethological signals, cues, and indices can provide useful information about why music induces only certain emotions and not others, why listeners often report mixed emotions when listening to a music piece, and why only certain musical patterns appear to produce similar responses across different cultures. In addition, Matthew Sachs suggests that the ability to recognize the emotions of others might be influenced by musical training.

These findings indicate that innate auditory responses, learned associations, and training shape our music-based emotional world, which can be perceived and understood by others via sound-based communication patterns. Finally, archeological evidence reveals how traces of music-related artifacts found across thousands of generations may imply that music indeed has an evolutionary function. Ian Morley’s PhD dissertation An Investigation into the Prehistory of Human Musical Capacities and Behaviours, Using Archaeological, Anthropological, Cognitive and Behavioural Evidence shows that:

Musical capacities have their foundations in inter-specific tonal emotional vocal expression, and rhythmic-motor coordination of corporeal musculature in the execution of such vocalisations. These increased in complexity throughout the Homo lineage and diverged from linguistic capacities with the development of lexicon and syntax; symbolic associations and diversity occurred with Homo sapiens, who were carrying out sophisticated instrumental musical behaviours upon their arrival in Europe.

The lines of evidence in support of the idea that music functions as a biological evolutionary mechanism are, as we have seen, multiple and varied: genetics, neuroscience, ethology, and archeology all appear to support the idea that music evolved ancestrally as a way of generating emotions, and, ultimately,

38. “A signal is an evolved purposeful communicative behaviour, such as evident in a rattlesnake’s rattle [...]. By contrast, an ethological cue is a non-functional behaviour that is nevertheless informative. An example would be the buzzing sound produced by a mosquito suggesting an imminent attack. [...] An index is defined as a type of signal whose variability is causally related to the quality being signalled—and which cannot be faked. An example of an index is the marking of trees by tigers.” In David Huron, “Affect Induction through Musical Sounds: An Ethological Perspective,” Philosophical Transactions: Biological Sciences 370, no. 1664 (2015): 1–7, https://www.jstor.org/stable/pdf/24504298.pdf?ab_segments=0%2FBasic_SYC-5055%2FTest&refreqid=search%3A790f9fb84b9e9176d6c6e5cb2bece#310.
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social cohesion. In the context of global issues such as climate change, this cohesion becomes an important and energizing element that gives meaning to people’s actions towards their common goal for a healthier planet.

Conclusion

This paper has explored, in a broad and general manner, the role of music in raising awareness about human-driven climate change. This exploration comprised a four points of investigation: (1) the function of words and music in the context of the worldwide movement of climate change-based music; (2) the ability of music to serve as a psychological mechanism eliciting empathy and compassion; (3) the biopsychosocial underpinnings of music and their links to current evolutionary theories regarding the origin and function of music; and (4) the psychological mechanisms and neurobiological features of music perception that generate the fundamental building blocks of emotional responses related to music. Through the analysis of those four elements, this paper has investigated how music leads to social cohesion and group effort necessary to bind people together in a shared musical experience that recognizes and focuses upon the need for an ecologically healthier planet.

The understanding of the biological, psychological, and social underpinnings of this performance-music-audience axis is therefore crucial for any form of evaluation of the impact of music and its related messages from both emotional and social perspectives. Future research in the domain of music and climate change could identify with more detail the aspects of the music-for-climate-change initiatives that are best positioned to strengthen the bond between artists and audiences, and, therefore, increase support towards the cause. Studies designed to investigate which kinds of artists might be more suitable to promote the cause more effectively, and which kinds of genres are more likely to make an emotional and cognitive impact in the largest number of listeners around the world. Although we may imagine that large-scale events with high-profile artists might produce much bigger effects than smaller-scale events promoted within local communities, it is necessary to measure responses and levels of engagement over time resulting from participation. It is possible, for instance, that large-scale events may elicit greater immediate participation due to a number of factors, such as the appeal of famous artists, but result in little lasting awareness and engagement in the cause to fight climate change. These kinds of issues also bring about the question whether climate change awareness should be instilled in the population through world-wide programmes and global events, or whether we should focus more on teaching our communities about climate change through arts and music at a local level, and through activities that are created for and by smaller social groups (e.g. families, schools, and towns), social units that remain fundamental for the creation of empathy, compassion, and social bonding.

A lot of what we know today regarding the power of music to elicit emotion, promote social-bonding, and foster empathy comes from the field of music cognition, an interdisciplinary field of research that unites and integrates the work of musicians, psychologists, neuroscientists, music therapists, music theorists, musicologists, computer scientists, and linguists for the study of biological and psychological underpinnings of music processing. The interdisciplinary breadth of music cognition has allowed scholars to tackle important issues about music from numerous perspectives: from sound perception to mental processes related to music processing and meaning, from problems about the neurobiology of music to issues related to its evolutionary significance. Further explorations of the relationship between neurobiological, psychological, social underpinnings of music could prove advantageous. For example, this article has suggested that the underlying common factor between vocal and non-vocal music is the score itself, which is present in both songs and non-vocal repertoire. Studying more specifically how vocal and
non-vocal music may each uniquely influence the biological and psychological dimensions of shared sociality of music and contextualizing their relationship within currently accepted theories of evolution of music, could help us better understand whether the coupling of words and music versus music alone changes the degree to which artists can convey their messages about climate change successfully.

Music also appears to be an evolutionary mechanism that supplies us with the kind of emotional experiences required to better understand and empathize with each other, binding us together and reminding us of our interconnected existence on this planet. Currently, many populations are experiencing the climate crisis in its initial stages. Unlike population responses to pandemics or natural disasters, the felt absence of an “acute” crisis enables individuals and groups to delay taking action quickly and effectively to prevent or reverse further climate change. When individuals do not urgently perceive the effects of crisis in their own lives, they lack the required motivation to act. Music may offer a potential bridge to this gap, providing the necessary feelings of urgency and desire to respond to a crisis in the making.

To conclude, music constitutes a powerful vehicle through which artists can spread the message about issues related to anthropogenic climate change, connecting people through its ability to generate powerful and binding emotional, motivational, and social responses. The role of the musician-artist is, in this sense, the role of a leader whose vision about climate change can shape the consciousness of people, by channeling and aligning, through their artistry, music performance and listener perception in scope and focus; and by ensuring that audiences around the world perceive, understand, and assimilate the underlying message of urgency, and the need to take action in the fight against climate change.
Bibliography


Andreoni


