



**University of
Nottingham**

UK | CHINA | MALAYSIA

Music as Emotive Transmission in The Human–Pet Dog Bond

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A thesis submitted to the University of Nottingham in
partial fulfilment of the requirements for the degree of
Master of Research in Music

March 2023

Word count: 24,997

Abstract

There are many findings within the research community that remark upon the lives of dogs living in rescue and rehoming centres. Evidence pertaining to the reasons for dog relinquishment are varied but demonstrate that many behavioural issues are involved, and that leash-reactivity is a prominent feature. The way in which music may impact upon the behaviour of dogs has also created research interest, but there is little evidence to demonstrate this phenomenon in the companion dog, sharing the human–animal bond. This thesis, although bearing an ethnomusicological framework, incorporates scientific elements which draw upon more of a reflective appraisal of experiences and anecdotal evidence, combining quantitative and qualitative means of data-collection. Research participants self-reported by providing answers to a questionnaire following a research task which involved listening to their preferred choice of music whilst walking with their companion dog. Reflection of self-reports from the participants gave some suggestion that leash-reactivity may have been reduced upon listening to music whilst walking with their dogs, but more significantly, discoveries of their emotional responses to music whilst spending time with their pet-dogs was revealed. These findings are supported by physiological and psychological emotional responses which were experienced by the owner and may support the human–pet dog bond.

Acknowledgements

I wish to express my gratitude first and foremost to my supervisors, Mervyn Cooke, and Xenia Pestova Bennett. I wish to thank Xenia for her support in the early stages of this thesis and Mervyn for his continued engagement and encouragement, without which I would not have developed both as a writer and researcher. I am also grateful for the help and guidance of David Laven, who with his direction has allowed me to develop the confidence to grow and explore new interdisciplinary fields of research. The support I have received from family and friends has been of immense value and I am truly grateful, but for every moment I have spent writing, at least one faithful companion has been by my side, so I say a final heart felt thank you to my precious dogs, Heidi, Pepé and Tico, my furry associates.

Table of Contents

List of Figures and Tables	iv
Introduction	1
Chapter One <i>Overview of Research into the Field</i>	4
Chapter Two <i>Literature Review</i> <i>Methodology</i>	20
Chapter Three <i>Human–Animal Interaction Project</i>	40
Chapter Four <i>Musical Companions: Emotive Encounters.</i>	52
Bibliography	65
Appendix One <i>Dog-Walking Questionnaire</i>	79

Tables

Fig 3.1. <i>Instances of Reactive Behaviour in Dog's as Self-Reported by Owners'</i>	41
Fig 3.2. <i>Demographic information</i>	42
Fig 3.3. <i>Participants' preferred musical choice during participation in walking task.</i>	42

Introduction

The academic and scientific study of music is identified as musicology and embraces culture and history in all fields of music, using various forms of enquiry to illuminate and disseminate research discoveries. There are various branches of musicological research, including how music functions as an art form, its societal perception, the historical context of music, genre and style, and the structure, analysis and means of composition and performance (American Musicological Society n.d.). The study of music in cultural and social contexts is known as Ethnomusicology. This interdisciplinary field of practice examines music as a social process, encompasses all types of music and geographical areas and typically engages in ethnographic fieldwork (Society for Ethnomusicology 2022). This thesis is composed of musicological research with an ethnomusicological framework examining people and their companion dogs in the United Kingdom, all who live in different areas and who chose to walk their dogs in different environments. Additionally, discussion of various styles and forms of music, such as classical music, popular music, and sub genres of popular music is considered. Aesthetics of the emotions in music are also discussed in ways which demonstrate how music provides functionality, not only as an art form, but in its perception by the audience within the study. This has greater influence throughout the study where social and environmental interests are highlighted, and anecdotal evidence from participants is reflected upon to gain insight and conclusion of the effects that certain pieces of music had upon pet-dog owners.

According to the American Veterinary Association (2022), the human–animal bond is a relationship between people and animals which is self-motivating and equally valuable, involving, but not limited to the physical, psychological, and emotional interactions of people, animals, and the environment. The term interaction implies a mutual action or influence, such as communication with someone or something (Merriam-Webster 2022).

These interactions are predisposed by behaviours necessary for ensuring the health and wellbeing of both human and animal. The interdisciplinary research field of human–animal interaction examines both humans and animals in their surroundings and in social and cultural contexts, whilst observing their interactions. Observing the ways in which animal lives interconnect with human societies is an explorative method integral to this field of research. Human–animal interaction is a broad term which defines many relationships and forms of communication. The domestication of animals has paved the way for the notion of the human–animal bond, which lies at the core of human–animal interaction, thus, also recognising the influential and beneficial aspects of such relationships between humans and animals.

Our interaction with the animal kingdom begins almost inherently from the moment we are born. We share our outdoor environment with a myriad of wildlife that may stimulate the senses, such as birds and their birdsong, farm animals and their distinct aroma, and perhaps our companion animals whom we may have tactile relationships with, and with whom the ability to build strong, lasting emotional relationships is also possible.

Certain situations can evoke worrying, distressing and even traumatic response in animals and their owners or caregivers. Such situations include intimidating or challenging dog walks, where reactive dogs are present, or indeed part of the cause. These situations may be intensified by uninterested or ill–informed owners, who fail to support those who take the necessary steps to ensure a safe and happy environment is maintained for all concerned. In a recent Paw Report (PDSA 2018), 62% of pet owners stated that they had felt frightened by the behaviour of another dog. Additionally, 12% of dog owners stated that they had not provided any means of training for their dog. According to the Animal Welfare Act (2006), a person responsible for any animal has a duty to ensure its welfare, including the provision to enable the animal to display normal behaviour.

The veterinary environment may also be a source of stress, and a contributory factor of fearful behaviour in animals. Research by Döring *et al.* (2009), demonstrated that in a study of 135 dogs, fear-related behaviours were displayed in 78.5% of the dogs upon visiting the veterinary clinic. This is a frequent observation in many veterinary practices and may often be intensified by the actions of the owners or caregivers. According to Walker *et al.* (1997), owners and caregivers who choose to calm their dogs may in fact, be rewarding the animal for their fearful response, therefore encouraging the fear-related behaviour. Although it is difficult not to reassure a much-loved companion animal in such a situation, it is important to understand which is the more sympathetic approach.

According to Volk *et al.* (2011), a consequence of the development of such fear-related behaviour in a large proportion of our animal population, is the delay of owners seeking necessary medical attention for their animals by as much as three days, due to the fear and anxiety felt by both owners and animals. There is much evidence to support the veterinary profession in their ongoing efforts to provide low stress environments and compassionate veterinary teams for animals (Rodan *et al.* 2011; Hammerle *et al.* 2015), but there is little research which emphasizes the role of the owner or caregiver in such situations. As animals can grow distinct bonds with humans and those who they spend most of their time with, a positive and calm manner will support an unfamiliar or uncertain situation (Vetsure UK 2017).

The use of music as a form of therapy is used in the human community, where engaging with it can initiate positive change in communication and well-being (BAMT 2020). This research project investigates the phenomenon of musical interaction as a communicative process in the human-pet dog bond, offering a critical reflection of the role in which music and emotion play, through exploration and discussion of anecdotal evidence of dog owners.

Chapter One

Overview of Research into the Field

There is much research evidence which explores music as a means of emotional transmission, particularly in medical circumstances in both human and non-human subjects; however, I investigate the likelihood of the transmission of emotion from human to dog, using music as a means with which to focus emotive stimuli. The project is interdisciplinary in nature and combines music research with the psychological and physiological elements of the effect of musical emotion upon the human-pet dog bond. These are further demonstrated in chapter three, in a small research intervention involving a dog-walking activity, including twelve human participants and their pet-dog companions in their participation in a given task. In this first chapter, I provide a brief account of the varying ways in which this emerging field of research is explored, to gain some understanding of the wider context of the project. Further contextual material is discussed, regarding the provision of music as a form of therapy or therapeutic intervention in the medical setting. Moreover, the significance of human-animal interaction is considered in relation to the social and cultural environments both kinds inhabit. A further detailed description of the development of the project is discussed in the methodology, also included in the latter half of this first chapter.

A narrative review of quantitative studies and neurological literature, involving music-based interventions used in palliative cancer care by Archie *et al.* (2013), summarized research conclusions and discussed not only challenges, but also new possibilities and practicalities as a result of this emerging field of research. A particular emphasis was placed upon randomized controlled trials, meta-analyses, and systemic reviews between 1970 and 2012. There are common themes in the available evidence to suggest that music may have a positive impact on pain, anxiety, mood disturbance and quality of life in cancer patients. It

can also be seen that developments in neurobiology may offer awareness of the possible systems and neural pathways in which music influences these outcomes. Additionally, according to O’Callaghan (2009) and Stanczyk (2011), there is increasing awareness within the field of palliative care for cancer patients, of the therapeutic use of music as a form of complementary intervention. This is primarily due to the cost effectiveness associated with such involvement, but also because of the little side effects induced.

Therapeutic use of Music versus Music Therapy

The two distinct forms of musical intervention most commonly used are the therapeutic use of music, and music therapy. The former is defined as staff-administered pre-recorded music, offering only a stimulus and a response, with members of staff most often found within the healthcare setting, but not specifically trained in musicianship. On occasion, researchers may also administer pre-selected music to patients or clients, but these research staff may not have undergone any formal music therapy training. (Trondalen and Ole Bonde 2012). The composition of species-specific music has a growing interest, and music has been composed for the feline and canine population for use in the therapeutic setting to aid animal welfare (AMCTeam 2015). Music therapy is defined as a more tailored approach, in which a trained music therapist will offer patients pre-recorded music, live music, or even interactive music (Munro and Mount 1978). The music-therapy process creates a relationship which is individualised, involving a therapeutic association, providing ongoing assessment, treatment and evaluation of the client by the therapist (Bruscia 2013).

Music-based interventions have demonstrated mild and moderate anxiolytic effects in recent studies, as highlighted in a 2011 Cochrane Review (Bradt *et al.* 2011). Self-reporting techniques were used by 386 cancer patients in a total of seven studies analysed in the

review. These studies included the provision of music perioperatively for 15 out of 30 breast cancer patients requiring mastectomy (Binns-Turner *et al.* 2011), and directly prior to adjuvant chemotherapy sessions for 30 out of 60 further breast cancer patients (Bulfone *et al.* 2009). Music was also provided to paediatric cancer patients during invasive procedures (Bufalini 2009), and to adults with hematologic malignancy during bone marrow biopsy (Danhauer *et al.* 2010), and also during chemotherapy (Harper 2001).

Hilliard (2003) investigated the effects of music therapy on the quality of life of adults diagnosed with terminal cancer, receiving hospice care in their own homes, comparing them to those only receiving hospice care and no musical intervention. Results demonstrated that quality of life increased and continued to do so in patients receiving music therapy than those who did not.

There are numerous studies which have attracted the attention of music for use in a therapeutic role for the domestic dog in rescue kennels. Kinnaird and Wells (2022) investigated the effect of classical music on the behaviour of pet dogs in rescue centres in response to separation from their owners, which can be a stressful situation for some dogs. Results demonstrated that classical music had a moderately calming effect on the dogs and that this type of stimulation encouraged the dogs to settle more quickly than any other form of auditory stimulus; however, further research was recommended in a wider variety of contexts.

Additionally, Boardman (2014), investigated the effects of relaxation music, such as yoga music, upon behavioural stress signals produced by 25 pet dogs in a small urban veterinary practice. Yoga music can be chosen from many different genres, but popular choices are classical, ambient, and ethnic genres, which are selected for their calming, soothing and relaxing qualities. Music is deemed an essential feature by many yoga

enthusiasts, due to its ability to influence peoples' emotions and mental perception (Theresaann 2022). Observations demonstrated that yoga music had a positive effect on decreasing stress levels in dogs who were admitted to a veterinary hospital for day case procedures.

According to Merriam-Webster (2023), the prevention, improvement, cure, and maintenance of one's health is typically defined as the science and art of medicine. An emerging body of research practitioners from diverse disciplines, such as the health sciences, physical and social sciences, medical humanities, and the healing arts, are approaching music and music health by integrating innovative ideologies to improve the quality of life, prevent illness and disease, and potentially cure and heal (Koen 2012: 1, 7). When music is used by a medical practitioner whilst treating a patient in a clinical setting, the treatment is called music medicine (Jernigan 2021). For instance, McIntosh *et al.* (1997) exposed patients with Parkinson's disease to quick, march rhythms during a walking task and reported significant improvement in their gait, speed, and stride. There is also much evidence to suggest that music medicine and music therapy are both supportive to the patient in the palliative-care setting in aiding the reduction of anxiety, especially in situations where invasive medical procedures may be necessary, such as surgery or prior to receiving radiation therapy or chemotherapy. However, little is known about how much music patients should receive by dosage, to decrease the requirement of pharmaceutical drugs.

Conclusions

It is clear that animals experience challenging and distressing situations in their daily lives, and that these situations can embed firm physiological and psychological consequence, which may develop in the form of fear-related behaviours. Such behaviour may also be intensified by the role of the owner or caregiver, depending on the ways in which each situation

encountered is dealt with. Regrettably, and as a further consequence of the presence of such fear-related behaviours, and owner fear and anxiety, some animals are not afforded the opportunity of presenting for veterinary care in an appropriate and timely manner.

There are undeniably further drawbacks, such as disruption to the family routine, the possibility of the unexpected costs of specialist behavioural experts, and regrettably, the consideration of owner relinquishment, all of which may create significant long-term issues that may impact the human-animal bond, but with which musical intervention may provide some respite. Music has been used successfully as a form of therapy for humans in areas such as cancer care, paediatric care, and palliative care, to alleviate feelings of pain and anxiety and to also assist in instances of mood disturbance. Evidence would also suggest that musical intervention may also improve quality of life. There is indication of an increasing research community, both scientific and musicological, that are keen to explore the possibilities which musical interventions may have to aid animal well-being; thus, it would seem feasible to suggest that the positive effects of musical intervention proven in previous research in humans and dogs could be further implicated. This may offer further knowledge in support of interdisciplinary research into the balance between pharmaceutical drugs prescribed, versus music therapy and the use of music as therapeutic intervention for both humans and animals for stress related matters.

The nature of my research project covers much interdisciplinary terrain, including culture, medicine, music genre, history, function, structure, and the environment. I therefore place my methodological process in the interdisciplinary plane of ethnomusicology, where music may potentially affect change in a small community of dog owners and their companion dogs.

Methodology

Introduction

Following contextual research, the following methodology documents my research aims and the ways in which exploration of wider research evidence assisted in the formulation of my research design and methodological processes. Consideration of ethics was given to this project, therefore rigorous procedures and regulations were followed and maintained, in accordance with the University of Nottingham Code of Research Conduct and Research Ethics Committee, details of which are also discussed. Limitations and confines in the methodological processes encountered during the design process are also debated, with some conclusion of the ways in which these were appropriately dealt with. Interdisciplinarity has been a prominent feature of my research, and is also discussed with other important features, such as data collection, consent and confidentiality.

Research Questions

Dogs Trust (2020) reported that their most common reason for the receipt of relinquished dogs was due to behavioural issues. Many of these problems are often the cause of external influences, such as changes in routine or lifestyle changes in the household, which may cause a shift in the emotional setting, and other changes which are difficult for both animals and owners to negotiate. My research focusses on the ways in which the emotional state of the human may be affected by their personal choice of music whilst walking with their dog. If a noticeable variation in emotion is conveyed, can this emotional state affect their dog companion – and how? Cases of reactive behaviour in dogs, such as pulling on the lead, barking, staring and other unwanted behaviours whilst outdoors, can often leave owners embarrassed, sad, and generally disheartened with the activity. Aiming to promote a calm

emotional state in the owner may offer a possible source of resolution, thus demonstrating that music may have a positive effect on the human–dog bond.

Background Research

Following a review of some of the relevant general literature available, in addition to more specific sources, I investigated further scholarly research via searches of sources including PubMed, Elsevier, Proquest, JSTOR, Applied Animal Behaviour and Ovid. Words and phrases in the initial search criteria included music and dogs, music therapy and dogs, human–animal interaction, human animal studies, emotions, animals and emotions, music and emotions.

Means of Data-Collection

A questionnaire consisting of nineteen questions was formulated, with most questions pertaining to qualitative methods of data collection. The first ten questions were demographic in nature and were followed by a further nine which were of a more probing nature (see appendix 1).

Materials

It was necessary for all participants to own a dog and agree to use their own phone, iPod, or other such mobile media playback device which was small enough to take on walks, along with a set of headphones, earphones, or ear pods to enable the owner to play one music track of their choice without allowing their dog to hear any of the music.

Experimental Method

For the experimental stimulus, participants were asked to choose a piece of music which they found capable of triggering emotion and to play this through their mobile media device and headphones whilst taking their dog for a walk. Prior to commencing this activity, participants

were also asked to fill in the first thirteen questions of a nineteen-question questionnaire (see Appendix 1) which was disseminated electronically via Survey Monkey to retain participant anonymity and fulfil Covid-19 legislation.

The questionnaire was designed using ethological methodologies, involving behavioural observations made by the human participants of their dogs during the activity. This was derived from the use of an ethogram, which is an index of the natural behaviours of a species observed during a certain situation (Pangal 2020). Enquiries of specific behaviours of participants' dogs were sought in Question 1, followed by triggers of such behaviours in Question 11. This led to Question 12, concerning the participants' emotional state whilst their dog exhibited any such behaviours reported.

Once the first twelve questions had been completed the dog walk began as usual. Once the participants felt comfortable, they were asked to begin listening to their chosen piece of music whilst continuing their dog walk, aiming to listen right through to the end of the piece. The activity could be broken at any time for safety reasons, such as the dog requiring instruction from the owner, or the owner feeling uncomfortable or unsafe.

Once this activity was complete, they were asked to answer Questions 13 to 19 of the questionnaire. Questions related to the choice of music, emotional states, environmental surroundings, and possible changes in dog behaviour. The participants were not paid for their contribution to the project and there was no conflict of interest.

Recruitment process

Dialogue took place amongst friends and colleagues to engage potential recruits prior to receiving ethical approval. Participants were recruited by word of mouth and by means of social media through personal Facebook friends. Two friends kindly shared the initial Facebook post, which gained one further participant. Once interest was initiated, the study

pack was sent to participants via private message. The recruitment process indicated good levels of initial potential, with a possible fifteen to twenty participants demonstrating an interest; however, this waned somewhat once the study pack was circulated. During the month of the study (July 2021), the weather was at times particularly hot and incompatible for dog walking, which may have provided some justification for eventual non-participation in the study, also the school term had come to an end and some families were due to take long overdue vacations and may not have wished to concern themselves with participation in research studies during family time. Further issues pertaining to quantitative-data research questions may have also contributed to the challenging recruitment process and is discussed further in this chapter.

The final research sample consisted of twelve human participants and their fourteen pet-dogs (two of the participants had two dogs each). According to Polkinghorne (1989), this is considered adequate in view of the phenomenological nature of the research. Further considerations did limit the sample size, such as time restraints and access to participants, but the final sample size included people who were genuinely interested in the phenomenon of concern. There is evidence to suggest that a small sample could prove to be uneconomical or produce ambiguous results (Patel *et al.* 2003). However, Ellis (2010) states that a small sample can also offer meaningful and detailed data that reflect the proposed purpose of qualitative and phenomenological methodologies.

Consent

Informed consent was gained from all participants. Participants were informed digitally, in writing of the purpose of the study and the type of questions they would be asked, how their data and results would be stored securely, and how such results would be utilised prior to signing the consent form. This process was also aided using a project information sheet. Participants were also informed that any of their comments would be anonymized in

the reporting processes. The process of gaining informed consent is a legal and ethical requirement that can provide transparency and honesty in the research process. According to (NHRMC 2007), when involving research, participants must make a voluntary choice to consent once satisfactory information has been provided by the researcher and complete understanding of all research elements and consequences are accounted for. The establishment of Research Ethics Committees, following the introduction of the World Medical Association's Declaration of Helsinki (1964), aided the creation of ethical strategies to assist researchers in the form of guidance, advice, and the granting of permission to proceed (Schrems 2013; Larkin *et al.* 2008). This project was reviewed by the University of Nottingham Research Ethics Committee, and followed stringent protocol utilising the available consent-form template indicating the participants understanding of the study, their ability to ask any questions, and if so, that they were successfully answered. Participants were also made aware that they were participating on a purely voluntary basis and that they were free to withdraw from partaking at any time without consequence. The consent form also highlighted any risks, informed participants of secure data storage and anonymity, and allowed them to demonstrate that they were above the age of sixteen years. Signatures were required by both participant and researcher and no participants withdrew from the project.

Data-Collection

The majority of data collected for my research was qualitative, with a small amount of quantitative data, such as the demographic elements involved in order to gain a holistic insight of the participants involvement in the study. This combination of data is helpful as it can strengthen certain features of findings as several elements of investigation accumulate, thus refining the understanding of the subject matter. Ellis (2010) also states however, that the collection of data by several means could prove onerous when attempting to process the data as large amounts of data may be difficult to analyse in a meaningful manner. To assist in

these processes, the use of a computer database may give some advantage. To process the demographic data for this project I found the use of Microsoft Excel extremely useful in terms of perceiving certain trends, finding averages for numerical data, and importing and exporting this information quickly and efficiently.

Confidentiality

All data collected was stored securely using password protection. Research participants were made aware of this in the full privacy notice for research participants' statement. As Primary Investigator, I had full responsibility for ensuring all participants were protected in every way possible. This process also included dissemination and reporting of results, storage and analysis of data, and the creation of a trustworthy environment for the participants to proceed in the study. O'Hara and Neutel (2002) suggest four commonly successive, but often overlying stages of the research project, all requiring levels of confidentiality. These begin with data collection, which may be data collected from current or previous research, or as in my particular study design, data specifically collated for the research project in the form of a questionnaire, or this could be an interview if necessary. Any data collected from other sources and in other formats requires amalgamation, which is the combining of all data in preparation for analysis. Once analysis has taken place, the data must be stored safely, results presented and published if possible, and the final disposal of any data related to the research must take place.

Personal information of research participants, such as names, initials, addresses and other identifying material should never be released. Personal identifiers are sub-categorised into three areas by O'Hara and Neutel: unique identifiers, indirect identifiers and unique attributes. Unique identifiers connect the data directly to the participant, such as a name or date of birth, but are not normally essential data and can be destroyed. My own study design

specifically avoided the use of participants names to protect their confidentiality and it was not a necessary component of data collection.

Data which may identify a participant indirectly are known as indirect identifiers, and these may occur in the form of gender, age, and postal code. Gender and age were indirect identifiers included in my data collection, and to destroy such data would be harmful to the study. Rather than take specific dates of birth from participants I chose to code this data and group ages into ten-year formats, which would make identification somewhat more difficult.

Unique attributes are often found in scientific study, for example, the health and nursing profession and the study of a particular patient group where one would expect to find certain unique attributes in terms of the study of a disease or health topic, but this could also cover a wider subject area. Although an interdisciplinary study, the unique attributes within my own are my personal interests of the human–pet dog bond, emotions and music, and the study of particular participant groups who share some common interest and have access to companion dogs.

Limitations of Available Research Evidence

The majority of previous scholarly research had been conducted in rescue or rehoming centres, and this did not represent the population of domestic dogs as a whole. While rescue and rehoming centres offer sanctuary and rehabilitation for dogs, it is not an environment they are usually accustomed to, and I wished to characterise dogs in their home environment, fully knowledgeable of the fact that temperament and behavioural issues would still be a factor to embrace within the inquiries. This was also new research in the field of music and the human–pet dog bond, and I felt the chosen group of participants were fit for purpose. Several previous studies involving music and the domestic dog have repeatedly used dogs housed in rehoming centres rather than in the domestic or human family environment. It is

therefore important to recognise these trends to determine research opportunities which may be developed and to also seek new innovative research interests; moreover, allowing my research to demonstrate an original contribution to knowledge in the musicological field of the human–animal bond, and the involvement of music and emotions.

Limitations of Design and Conduct: Dealing with the Unforeseen

This is an interdisciplinary research project with a strong ethnomusicological framework involving scientific elements which reflect upon the contributor’s experiences during their participation in the given research task. Any numerical data stated within the results is purely in the interest of comparison within this project and bears no statistical status.

The COVID-19 pandemic raised issues in terms of the design and conduct of my practical experiment, dissemination of instructions, and of data collection. In accordance with the University of Nottingham Code of Research Conduct and Research Ethics regulations and protocol, it was necessary to send all relevant study instructions via paperless channels, such as email or survey monkey, and to receive all data via the same channels. This raised no issues and participants were genuinely interested in the research and keen to be updated of the results. Due to the restraints of the COVID-19 pandemic and the ethical considerations imposed, meeting with participants was not allowed by law at the time of design. Therefore, the participants became research assistants, and although this situation limited my research in that I could not be in attendance, it assisted in the matter of experimental blinding as the human participants chose the musical stimulus and concealed it from myself and the dog participant.

The Loan Research Participant

A report by Campbell (2021), highlighting the mounting number of dog thefts during the COVID-19 pandemic, quite possibly fuelled by a rise in dog ownership since the beginning

of the first national lockdown, and the huge increase in the cost of dogs, gave me cause for concern in the design of my study. I did not wish to leave my participants any more vulnerable than they may already have been, and the thought that I had asked them to wear headphones, which essentially took away one of their senses left me with a feeling of slight unease. After much thought, observation, and discussion with potential participants prior to the commencement of the study, I discovered that almost half of my research sample already listened to either podcasts or music whilst walking their dogs. As the participants were choosing their own environments to which they felt safe and accustomed to, I became comfortable with the design and added instructions which suggested they could stop at any time, and converse with their animals if necessary, keeping safety a paramount feature.

Protection of Researcher and Participant

The nature of my investigation involved a combination of quantitative and qualitative data collection. The quantitative data addressed demographic topics and was necessary for detection of any trends in behaviour of certain groups which may have occurred throughout the duration of the study. In addition to this, the qualitative data investigation was more searching in nature, and asked particular questions such as the reasons behind the participants choice of music in the study. Some of the answers were of a very sad nature, such as reminding them of their unborn baby whom was sadly miscarried, and another participant who recalled memories from their childhood as part of the reasons for their chosen music track. During the study they had wanted to share the meaningful memories with their dog, but felt unable to make that connection, as both themselves and their dog could not hear the music together due to the nature of the study which left the participant feeling depressed. I had not intended, nor was I prepared for my research to become emotionally demanding, but on reading these responses, and others, I immediately became aware of some of the sensitive issue's participants were reflecting and sharing with me, and I also became conscious of the

privileged position to which I had instantly become involved. According to Dickson-Swift *et al.* (2009), although there is increasing concern of the emotional nature of qualitative research, and the involvement in which researchers may often find themselves immersed, there are few accounts of their experiences. Upon reading the responses I did take a break to reflect on how I had perhaps caused this participant some type of suffering, I felt guilty, and I also required time for personal reflection. For early careers researchers the emotional content of qualitative research, particularly when investigating emotional topics, can have powerful bearing. In addition, it is important to implement some form of self-care as a researcher, such as attending workshops in advance or accessing counselling services, as there is little preparation for this subject matter at present (Rager 2005).

This topic also raises concerns for the potential impact on the research participant. The inquisitive nature of qualitative research includes examination of a participant's opinions or reasons behind events or matters. According to Richards (2002), a participant's personal background cannot necessarily be predicted appropriately to questions of a sensitive nature which may proceed to incur anxiety or distress. Also, the nature of open-ended questions, which is inevitable in qualitative research, cannot extinguish individual participants from contributing in-depth context to their responses. It would prove useful to allow the follow-up of participants in order to offer guidance or signposting for mental health issues, and for the researcher to also make provision for the care and well-being of their own mental health.

Interdisciplinarity

My research methodologies are interdisciplinary, combining the arts and STEM (science, technology, engineering, and mathematics) subjects, researching unexplored areas, and using certain techniques in new ways, such as asking participants to view the behaviour of their dog rather than the researcher. Interdisciplinarity can help to accommodate research paradigms, often the combination of diverse themes can shed light on new or emerging research. Robelen

(2011) discusses the notion of combining arts into the acronym STEM for it to become STEAM (science, technology, engineering, arts, and mathematics) as the growing impetus to discover ways in which arts subjects may improve engagement in learning whilst also supporting creativity and innovation. These educational slogans are widely understood, but the inclusion of the A for arts offers a holistic and imaginative education for children, thus facilitating communicative collaboration, critical thinking, and creativity (Schofield 2023).

Chapter Two

Literature Review

Introduction

The increasing field of human–animal studies is typically well researched but is often generalized as an interdisciplinary study of human–animal relationships. The distinction between these disciplines is that human-animal studies examine the existence and impact that animals have in the world, and upon our treatment and understanding of them. In comparison, the study of human-animal relationships centres more closely on ethical concerns, such as the human-animal bond and the value of appreciating animals (Shapiro, 2020). However, academics within this field share a common conceptualised view, that the way we interpret and comprehend our world is a direct influence of the presence of nonhuman animals (Shapiro 2020). Subsequently, there is growing research evidence indicating that the field of human–animal interaction studies has become increasingly popular as a model of investigation and stimulating area of academia. Furthermore, many topics have become points of interest, such as raising mood (Hart 2006), eliminating loneliness (Zasloff and Kidd 1994), aiding coping mechanisms, such as reducing anxiety in children who own animals (Rowe *et al.*, 2021), and providing the potential to raise activity levels in both humans and animals (Wells 2015). However, there are fewer research studies incorporating music or sound into human–animal interaction–based activities.

This literature review aims to evaluate and review five articles which examine the influence of music and sound upon humans and dogs collectively, albeit in limited context due to the lack of research in this area. These articles were chosen for discussion because all

involve observation of the behaviour of the domestic dog as a species whilst subject to musical stimuli, which correlates with my own research intervention. Furthermore, the fourth article demonstrates the human-animal bond between dog and owner in the veterinary environment and highlights important issues around owner self-reporting behaviours of their animals in conjunction with clinical findings and how useful both methods may be when interpreting results. Also, as I wish to contribute to this area of limited musicological research, I found these articles appropriate to inform of some of the difficulties I may face and how I may interpret a level of interdisciplinarity whilst seating my research within an ethnomusicological context.

The first two articles concern the effect of music upon dogs in the kennelled environment. The third article concerns puppies who reside in a kennelled environment, but who will proceed to become fully fledged working police dogs. The fourth article concerns dogs and owners who require a visit to the veterinary environment and is of specific value in terms of my personal interests and study, as it includes owner evaluation of the study and presenting behaviour of their dogs in addition to clinical findings.

The final article is a review of the influence of auditory enrichment on canine health and behaviour and encompasses several studies; I highlight several interesting factors.

The inclusion of studies of dogs from varying environments is important to demonstrate and represent research in the wider context, and to establish the variables within these studies. Furthermore, there is limited existing supportive research including owner evaluation or self-reporting of any behaviours. I comment on the methodology of each study, making comparisons and contrasting where relevant, highlighting strengths and weaknesses that prevail, and trends that become evident throughout the process.

Main Body

‘Four Seasons’ in an animal rescue centre; classical music reduces environmental stress in kennelled dogs.

Context

This study by Bowman *et al.* (2015), involved 50 kennelled dogs in total from the Scottish Society for the Prevention of Cruelty to Animals Dunbartonshire, and the West of Scotland Animal Rescue and Rehoming Centre. The dogs were divided into two groups: group A containing 27, and group B containing 23. Group A were exposed to seven days of silence by way of control, and then played music for a further seven days between the hours of 10.30am and 4.30pm. The dogs in group B were treated in reverse. The number of dogs studied at any one time was between one and five, due to the availability of the dogs being housed at the ARRC, and the fact that dogs were not always present as the study was conducted during normal opening hours. Some of the absences were due to veterinary checks and medical procedures, or public viewings. The stimulus volume was not divulged but was set manually by the researcher.

Hypothesis

Playing classical music to dogs housed in an animal rescue and rehoming centre would reduce physiological and psychological stress.

Discussion

Stress factors of the kennel environment are highlighted within this study, such as the high noise levels already present, to validate some of the reasons for investigation, such as providing enrichment of simple and economical design, but the researchers fail to comment on the length of time any of the dogs had previously spent in the kennels. A recent investigation by Sales *et al.* (1997), confirmed peak noise values regularly surpassing 100dB

during the day, and often reaching levels of 125dB, with barking being a major contributor, but also with the addition of general kennel husbandry a further problem. Additionally, Milligan *et al.* (1993) state that researchers must consider the important consequences for behavioural and physiological experiments, and for animal welfare, due to the uncontrollable daily variables of the acoustic environment of laboratory animals. This in turn may affect the results of future investigations as stress levels may increase with time spent in this environment.

It is evident that the kennelled environment does not represent the dog population as a whole and researchers must be mindful of this in their study design. The sample size of this particular selection was large, but unjustified, as just one researcher facilitated all recordings of observations per session during the study. Since the researcher did not use cameras to record behaviours in their absence or find a suitable way to transmit the musical stimuli to the dogs without the researcher also hearing the stimulus, there was a significant lack of blinding in this study.

Behavioural data was an important outcome of this study; however, at the point of subject selection, dogs which displayed aggressive tendencies were excluded. Such exclusion criteria suggest a selection bias. Furthermore, the data is incomplete, as some dogs initially enrolled on the trial did not complete due to their rehoming.

The study focussed on the behaviour of the dogs, but not on the stimuli; this is a missed opportunity where much data may have been correlated from such a source. Unfortunately, the only data supplied relating to the musical stimuli was that the chosen tracks were slow and low in pitch, chosen from the *300 Classical Favourites* CD. I would suggest the practice of using “classical” music in research is perhaps due to following the patterns and procedures of previous research, as there is a lack of supportive studies that offer any previously collated evidence, as stated by Bowman *et al.*, (2015). Additionally, the term

classical music is used in a rather generic manner in several of the studies referred to in this literature review, but it encompasses such a vast array of types and styles of music. As this audio content is not referenced within the bibliography it has been somewhat difficult to locate any of the tracks, which would also prove problematic for further research into the study. Furthermore, we are told the volume was set manually and maintained at the same level throughout the study, but we are not informed of the actual volume level. Stimulus volume is most important as the ear of the dog is much more sensitive than that of the human (Heffner 1983). Also, as previously discussed, the high level of noise already present in the kennel environment already sets a certain threshold in terms of acoustic-related stressful conditions. Any additional sound stimulus will only serve to increase this issue (Baker n.d.).

Salivary cortisol collection was used to test the hypothesis of the study. However, results showed considerable variation amongst the dogs, but with no statistically significant differences to highlight any observable trends. Although the use of salivary cortisol collection has been utilised for laboratory research (Kobelt *et al.* 2003), and in pet and rescue dogs (Coppola *et al.*, 2006), this practice is considered hazardous with animals of unknown histories (Rooney *et al.*, 2007), such as those in animal shelters. These animals may become fearful or aggressive during the research process, which could in turn harm the animals' future progress.

Effects of Music Pitch and Tempo on the Behaviour of Kennelled Dogs.

Context

In this investigation by Amaya *et al.* (2020), five greyhounds were acquired by the University of Queensland from the racing industry, with ages ranging between just over one year to five years, and five dogs were also acquired by the university at different times from the local council impounding facility: two Boxers, one Labrador, one Australian Kelpie and one

Mastiff, with ages ranging between one and 26 months (ten dogs in total), for use as research subjects. All dogs were moved to a new kennel block two days prior to the commencement of the study, to allow acclimatisation. Each dog had its own kennel that was private and out of view from other dogs and no staff members or volunteers were present when the music was played.

The stimulus

For five days, the dogs were exposed to ten different piano songs, white noise, and a control, which was ambient noise, followed by rest for two days to avoid habituation of the process.

The following five days were repeated with the same music, white noise, and control treatments. Music was selected from a previous study (Amaya *et al.*, 2020), with the piano the sole instrument, except two tracks, which were accompanied by violin for small sections. Each track was modified in pitch and tempo by increasing and decreasing of 30% to create four experimental treatments (high pitch, low pitch, fast tempo and slow tempo).

Explanations for choice of frequencies were given due to dogs' higher sensitivity to frequencies between 500Hz and 16kHz (Sales *et al.*, 1997), and to eliminate any distortion of sound in either track. The volume level was set a 65dB throughout the study. The music was played through four speakers spread evenly throughout the kennels (14 metres), in a loop via laptop for 10 minutes, followed by a 20-minute break; this process was repeated for a total of two hours and 40 minutes per day. Due to cleaning requirements in the kennels, trial commencement times varied each day between 9.35am and 11.27am.

Discussion

This was a relatively small study including ten dogs, which although small in number deemed very manageable. Much information in terms of stimuli data is provided within the framework of the study design, and this is most useful in terms of recreating or revisiting

research. Furthermore, evidence from previous studies support this study design and explanation, in particular, the decision to use piano tracks rather than orchestral stimuli, as supporting evidence suggests that it may require less neurological processing when listening to single instruments than multiple instruments (Leeds and Wagner 2008). However, no explanation was given as to why the researchers used white noise as part of the stimuli set; one such suggestion may be due to dogs' unfamiliar perception of abstract noise, therefore their reaction to ambient noise could be more meaningful to them as it is a more familiar concept. Also, the introduction of the tracks containing violin sections to accompany the piano may have caused certain anomalies in the results as not all stimuli data was directly comparable.

As in research by Bowman *et al.* (2015), there was once again a significant lack of blinding in this study, as the researchers could hear which tracks were playing at all times, although cameras were in place to record the research process in this instance, which does add some level of security as the researcher is able to review activity at a future date and use as evidential support. A further hindrance to the data-collection process was the fluctuation of trial commencement times each day. Unfortunately, this is the nature of the kennelled environment where the general routine of the day must continue.

Morton's motivational structural rules (1977) were used as a model for the researcher's findings. Morton's overall rule explains that any harsh, low-frequency sound sent by the signaller is perceived as aggressive by the receiver. The researchers therefore modelled any such behaviour in response to such music to this rule, as their suggestion was that the dogs were more unsettled and more alert when these types of track were played. Morton's motivational structural rules were designed primarily on vocalisations of intraspecific animals (although interspecific animals were included), mainly birds and their song, with a small mention of dogs. I question the use of such research design in this study

and in the kennelled environment due to unknown histories and background of the dogs chosen as subjects, but also because it is so dissimilar in nature to listening to the stimuli finally chosen. An improved choice would have been actual dog sounds if the researchers were to use Morton's model. Moreover, it is on one hand a kind act to provide dogs with a musical experience, but on the other hand an ethical consideration if the music were to cause any fearful or aggressive type of reaction in a dog that may already be suffering.

Additionally, Morton's rule continues to state that fearful and friendly sounds have a tendency towards conforming to the motivational structural rule design expectations, in that the signaller will send high-frequency and tonal signals but exhibit considerable variation.

This variation may be due to the existence of acoustic parameters other than frequency that might convey motivation information in fearful or friendly contexts. Also, fear and friendliness represent two very different motivation states in mammals, and motivational structural rules may not apply to both.

Effect of Auditory Stimulation During Early Development in Puppy Testing of Future Police Working Dogs. Topics in Companion Animal Medicine.

Context

All 67 puppies (34 males and 33 females), born over a two-year period for force speciality from the Portuguese Gendarmerie Canine Unit were analysed for standard socialisation protocol tests by Alves *et al.* (2018), including 27 German Shepherds, 19 Belgian Malinois Shepherds, 14 cross breeds of German Shepherd and Belgian Malinois Shepherd, and seven Dutch Shepherds. Auditory stimulation tests were developed at some point between the birth of several litters of puppies; thus, the selection process for the study was by convenience rather than choice. Hence the puppies were divided into two groups; the first containing 46 (born prior to the introduction of auditory stimulation) and the second containing 21 (born following the introduction of auditory stimulation).

Auditory stimulation was presented to group two in their third week of life, for two hours per day, with stimuli ranging from radio talk shows, commercial music, and environmental sounds such as traffic, sirens, and gunshots, at a volume level similar to that of human conversation. Environmental sounds were introduced at week five at a volume level equal to that of sirens and gunshot, the puppies were encouraged to eat and play whilst presented with this stimulus. By their seventh week of life, nine different auditory stimuli were presented to the puppies, one at a time sequentially. Results were evaluated on a scale of one to five by an independent evaluator who had never had any previous contact with the puppies and was the only person to have any contact with them during the testing periods.

Group one was not subject to any form of auditory stimulation and were developmentally tested in the usual manner with only the standard socialisation protocols.

Hypothesis

To investigate the effects of auditory stimulation during the early developmental stages of future police working dogs, and to explore what effects such stimulations may have upon the outcomes of early puppy testing in this environment.

Discussion

The introduction of auditory stimulation at such a tender age of a puppy's life (three weeks) must be dealt with sensitivity. This is the period in their lives when the ear canals have just reached a stage of maturity fit for the natural world (Mattinson 2019). It is also good practice to socialise puppies from an early age in the form of play and handling to provide them with the best possible foundation for behavioural skills, affording them a good start in life and the hope that they will progress to successful adult dogs with forever loving homes.

A particular strength of this study is that the researchers looked to introduce all stimuli very quietly to extremely young puppies, who in fact may not have any reason to be

fearful of such sounds as yet. This form of introduction along with play activities and the addition of food could act as a form of desensitisation, as the puppies are experiencing a negative sound, such as the gunshot and siren stimulus with play and eating, therefore it becomes a positive experience after all (Rawlinson 2017). Results demonstrated, that as the weeks progressed and the puppies advanced in age, they began to race towards their food bowls whenever any auditory stimulus was presented.

The use of an independent evaluator was an advantage in this study, as this created a blind analysis for the researchers, therefore protecting against bias within the study.

According to Nunan and Heneghan (2018), wherever ethically appropriate in research studies, blinding should take place. Blinding in research is the process whereby certain information is concealed from those involved. This may vary due to the circumstances of particular projects, such as study design and the role in which people play within the investigation. The types of information that may be withheld can include which tests are being evaluated, participation allocation groups and the evaluation of a hypothesis. If those involved in a research project become aware of which outcome is important to the research, bias may be introduced, therefore threatening the validity of the results (Mathieu 2020).

Negative aspects of this study were the huge difference in group numbers; group one was over double the size of group two. Overall, it perhaps did not make a huge difference to the results, but there were enough puppies to have three groups where further investigation could have been explored with a more equal participant analysis. Furthermore, this was a small sample size and not all breeds were equally represented in both groups in this study.

The puppies were not in a normal domestic environment and it was suggested that the results may be interpreted differently due to the personality traits of the working dog. Alves *et al.* (2018), stated in their discussion that domestic or companion dogs differ from working dogs in that their energy levels, sense of hyperactivity and leash reactivity may be lower.

Therefore, depending on what exactly the researchers are investigating, implications of such research may have an impact upon the novice researcher, who must be mindful in their approach to viewing articles that may seem initially fit for purpose, but on further scrutiny, obvious incongruities become evident and it may become apparent that certain search criteria are not met.

Effect of different types of classical music played at a veterinary hospital on dog behaviour and owner satisfaction.

Context

This was a large study by Engler and Bain (2017), involving 74 dogs at the Community Practice Service at the University of California-Davis Veterinary Medical Teaching Hospital. All dogs were visiting for either wellness checks, presurgical assessments or evaluation for a non-urgent illness and were accompanied by their primary caregivers. All dogs were examined by a veterinary student and qualified veterinary surgeon in one of three examination rooms equipped with a CD player. Likert scales ranging between zero to five, where zero indicated no visible signs of fear, anxiety, or aggression, and five indicated extreme levels of fear, anxiety, or aggression, were used to rate owner satisfaction of the hospital visit, and to also rate their perception of anxiety levels in their dogs during their examinations. Senior clinicians also rated fear, anxiety and aggression levels in the dogs using the same Likert scales.

Stimulus

Each examination room was set with one of three different stimuli: 1) modified classical music 2) unmodified classical music (original tracks), 3) no music (control). The volume of the CD player remained constant, but according to the type of stimulus played, this varied between 43dB and 73dB. The stimuli were rotated between rooms on a weekly basis over an

11-week period. Dogs were played music in the examination room whilst waiting for their appointments, following a period of the normal waiting regime in the usual waiting area.

Discussion

The use of the Likert scale to rate levels of fear, anxiety, and aggression in dogs at the end of each experiment raises issues that may influence the resulting outcomes of this study. By asking people to respond to a series of statements on any given topic, Likert (1932) developed the principle of measuring the extent to which a person agrees to such statements, thereby gaining a deeper understanding of the cognitive and affective components of attitudes. This is not to say Likert scales are not useful indicators for research, as they often offer levels of opinion rather than a straightforward yes or no (McLeod 2008). However, this allows for the collection of quantitative, rather than qualitative data, which may be easy to analyse in terms of statistics, but results may be compromised due to the inability for participants to further enlighten upon their experiences, which may offer an insight into new trends and opinions. Furthermore, social desirability may restrict total honesty in participants; for example, an owner in the veterinary environment may be reluctant to admit their dog was aggressive for fear of repercussions.

The modified music used as the stimulus was taken from the CD *Through a Dog's Ear*. The TADE series includes CD's and books aimed to aid the dog owner seeking resolution for behavioural issues, such as anxiety and noise phobias, by promoting a calm, healing, and relaxing atmosphere (Canfield 2008). Joshua Leeds, a music producer and psychoacoustics technician, together with Susan Wagner, a veterinary neurologist, both with a combined interest of the health effects of the human–animal bond, and the effect of sound on the human nervous system, developed the series based on scientific research into the physiological changes that occur in both humans and dogs when they hear certain sounds. Canfield also states that the human heart rate beats on average at around sixty beats per

minute, and that the most relaxing music matches this speed, acknowledging that a dog's heartbeat can vary according to breed and size, but they also find the same speeds of music just as relaxing as humans. Canfield's associate, Susan Wagner also claims that in clinical trials, 70% of kennelled dogs were relaxed by the arrangements, and 85% of household dogs were so relaxed they fell asleep.

I argue that within this study, the physiological differences of the dogs in terms of size, age and breed were not considered by the researchers, despite the demographic collection of such data. Over time, and with hard work and patience, older dogs often may be more accustomed to the veterinary environment and therefore find the process less stressful. As the music was played on a loop all day, not all dogs of the same size, age and breed were exposed to the same track for equal comparison, and each owner will of course have differences of opinion and preference in musical taste.

Results demonstrated owners regarded their dogs' anxiety and aggression levels slightly higher than clinicians did, and that the dogs demonstrated greater levels of anxiety when patients and owners were left to wait for their appointments in the examination room rather than in the usual waiting area. Gobbo and Zupan (2020) state that personality traits and other psychological characteristics exhibited in the human may facilitate the incidence of aggressive behaviour in their pet-dog companions. A requirement of this study was for the dogs and owners to visit the veterinary hospital. As the dog will have initially been unaware of the impending veterinarian visit there will have been no need for any sense of nervousness, yet the caregiver will have prior knowledge of the visit and may be worried or concerned. If this emotion increases, it may have been passed from the owner to the dog and present a negative situation.

Humans and dogs most often have a close relationship or co-habit in close proximity. Depending upon the owner's personality and the human-dog emotional bond, dogs who live

in a less stable environment, and who receive less sociable and emotional stimulation are more likely to behave in an aggressive manner, compared to dogs who do receive such attention. These results emphasize the importance of owner attachment to a dog for the latter's behaviour, and may serve as a foundation for future research on psychosocial factors influencing dog aggression. The demographic information should perhaps have included the length of time each dog had spent with its owner to gain a more certain evaluation of the results.

A Review of the Influence of Auditory Enrichment on Canine Health and Behaviour.

Context

Lindig *et al.* (2020), prepared a case study for the application of the use of music as therapy in the veterinary environment by reviewing nine studies which report of the effects of music on dogs. Most of these studies focussed on behavioural changes. The introductory chapter concentrates on the positive use of music therapy in the human species; for example, Umbrello *et al.* (2019) found that human patients in the stressful environment of an Intensive Care Unit were able to self-report significantly reduced levels of stress and anxiety when provided with a range of fifteen to sixty minutes of music therapy once daily. Furthermore, in a systematic review and two meta-analyses of the effects of music interventions on stress-related outcomes (De Witte *et al.*, 2019), report a medium effect of music interventions on psychological stress-related outcomes and a small to medium effect of music interventions on physiological stress-related outcomes, which demonstrates that music intervention groups benefit more than the comparison groups. This also highlights the point that interventions are beneficial in many different environments and healthcare settings such as mental healthcare, medical surgery, and daily life. However, Lindig *et al.* (2020) continue to stress that a comparison cannot be made between human and non-human species when considering any

such effect that music may have upon the evolution of a certain species. Klump *et al.* (1995), state that when considering the effects of music on the non-human species, previous studies of comparative acoustics have demonstrated the anatomy of the head, distance between ears and mobility and shape of the pinnae all have an influential part on the effectiveness of the acoustic radius. This is a strength of this review, as it is impossible to suggest that the effects of music therapy in the human species can be completely transferred to the domestic dog. Furthermore, McGreevy and Boakes (2007) collectively draw upon fifty case studies involving the daily training techniques of animals including companion dogs, which discuss how these processes evolve and how, within a species such as the companion dog, it is possible to create variation of perception and therefore perceivable outcomes of any training or intervention process.

A further strength of this study are the considerations over the genre of the music with respect to animal health and welfare. It is important to discuss not only the benefits of any exposure to music by non-human animals, but also report of any opposing effects, or indeed if no changes in behaviour were observed.

McDermott and Hauser (2007) tested new-World primates; cotton-top tamarins and common marmosets for their response when offered choices between slow tempo, lullabies, and silence as musical stimuli, and suggested that the tamarins and marmosets preferred silence, in comparison to the choice of their human counterparts, who preferred music. I argue the use of the term silence is used in a loose manner and should be explained more clearly. I would suggest the authors are assuming the reader will understand their use of the term silence as having no stimuli present at that time; however, a better use of terminology would be the use of the term ambient sound, and to explain that the primates preferred this in comparison to any type of musical stimuli. According to Roberts (2016), if there is no ambient sound, or for the purpose of McDermott and Hauser's explanation of the primates'

preference to silence, then a feeling of discomfort and disorientation may occur in a short space of time. Furthermore, Cox (2020) states it necessary to become enclosed in an anechoic chamber to extinguish all peripheral sound; however, this would still not achieve absolute silence due to the audible sounds produced by the body, be that human or non-human.

Conclusions

This literature review demonstrates a trend in the veterinary and animal behaviour research community towards aiming investigations at the kennelled or hospitalised environments, which also highlights several welfare concerns in the study of these dogs. Most kennels are often very noisy and busy, receiving dogs from uncertain backgrounds, often in traumatic circumstances and in need of veterinary intervention. The dogs are in these situations for many reasons, and for the majority, their senses are heightened due to the lack of normal living conditions, fear of past and present situations, and often because of separation from loved ones. The unknown circumstances of each dog prior to their placement in the kennels does not necessarily make them good candidates as research participants, and in fact the auditory stimulations which the well-intentioned researchers may believe will do them some good, may cause them harm.

The noisy environment the dogs are already a part of, consisting of generalized barking and kennel husbandry noise levels well around 100dB, are most certainly hectic enough without the additional constant loop play of some musical or auditory stimuli for several hours per day. Data regarding the length of time any dogs had been resident within the kennelled environment was unavailable, and as evidence suggests, prolonged exposure to such uncontrollable high noise levels on a daily variable basis, may increase stress levels in these dogs. The kennelled environment does not represent the dog population as a whole, and researchers should take steps towards investigations of the domestic population of dogs in

their own homes or natural environment. If research must be done within rehoming kennels, perhaps a quieter background situation would make an appropriate starting point.

A further environmental issue directly associated with the choice of research environment, such as rehoming kennels and veterinary hospitals, is the continuity within certain trials. It is unlikely this will be eliminated from research projects as rehoming centres have urgent need to rehome dogs in their care, and it is in the dog's best interest to find forever loving homes. More research into dogs' own homes and natural environments should be undertaken. There was considerable variation in trial timings, especially where studies involved the kennelled environment. This could be due to many factors, such as kennel regime, staff rota and availability, and the voluntary aspect of the work in some kennels. Furthermore, visits from the public hampered one of the studies, and any of these intrusions may serve to create anomalies in the results.

In all but one of the studies, lack of blinding was problematic. This causes issues in research and can compromise the results. For example, researchers who also collected data and knew which dogs were in which participant groups might have been inclined to record differently for different participants. Likewise, results and conclusions may also be determined inversely. Therefore, blinding as seen in the third study (Alves *et al.* 2018) by the use of an independent evaluator was good practice, as this aided the analysis of data in that there was no influence during or following the trials. The trial by Engler and Bain (2017), although useful in its sense of blinding for the researchers, was not so effective during the actual trial, as both human and dog could hear the stimuli simultaneously. This was perhaps their intention, but it seems difficult to separate the two issues of their investigation during one trial. Blinding in research must be considered carefully, and may also be a complex issue, especially in large studies where there are many factors to consider.

Most of the trials used quantitative and qualitative data-collection processes, and although much data was collected, including general demographics, much of this was disregarded. Obviously, every study had a different agenda, but it was difficult to assess why such questions were asked, and this may seem misleading to participants. However, it does highlight areas for further research and give other researchers material to develop. Qualitative data can allow the participant to elaborate on a topic by providing deeper answers, which may aid the researcher in their task and further their understanding of concepts and processes. Often a combination of quantitative and qualitative data can be helpful in giving a good balance of information, where quantitative data alone may be restrictive in certain circumstances.

Selection bias was also an issue, but this was perhaps inevitable under the circumstances of the environments chosen for each trial. Some of this was due to dogs displaying aggressive tendencies; this was of particular concern in Bowman *et al.* (2015) and the Four Seasons Animal Rescue Centre trial. Once again however, we have no indication as to how long the dogs were resident at the kennels to compare their stay with stress levels and kennel noise, and we have no data of their previous life experience to explain their behaviour. As salivary cortisol was collected from each dog as part of the study, one can only presume the selection bias may have been influenced by this procedure, but this is not recorded. In a further study by Alves *et al.* (2018), the selection bias was due to convenience of the birth time of the puppies involved. Unfortunately, as noted, this led to an unbalanced number of group participants, which is a high selection bias and is not good research practice.

By way of investigating from a behavioural and biological point of view, salivary cortisol collection was used in one of the studies as previously mentioned, however this activity brought forth no remarkable results, and research suggests the method of collection is not as reliable as other biological procedures that may be less invasive, such as urinary

cortisol collection. This may also be less hazardous for the researchers and therefore allow more participants who may exhibit aggressive tendencies to participate, thus reducing any such selection bias somewhat. Nevertheless, a combination of behavioural and biological investigation may provide useful supportive evidence and results but must require researchers with sound knowledge of required protocols.

As music or sound was the major component in all trials, it is unfortunate that there was a distinct lack of focus on these very stimuli. The lean towards classical music seems a rather popular notion in the research community in terms of stimulating dogs. A claim by Engler and Bain (2017), in the study involving dogs and owners visiting the veterinary environment, that playing classical music at a low volume can be a simple and cost-effective way to improve owner satisfaction with the veterinary visit is also echoed in other studies. Given the choice, the dogs would perhaps have no preference as to which genre of music was played, but volume is most definitely of paramount importance. In some trials volume was unrecorded, which raises further animal welfare issues which do not seem to have been addressed; this, in addition to the length of time dogs were subjected to unrecorded volumes of musical stimuli, may also serve to further complicate the situation. Moreover, playing music of any genre, could, in fact, enhance any physiological and psychological stress already experienced by dogs in the kennelled environment, or other surroundings such as the veterinary clinic and other situations which are new to the dog. This is also dependent upon the dog's previous experiences, and in some cases, it can be seen from the research presented in this literature review, age, gender, and breed all play their part to some degree in certain situations. The cost-effectiveness ideology of such intervention in the kennelled environment may be non-existent if financial input is required to treat any stress-induced physiological or psychological symptoms caused by musical intervention.

Research terminology requires clear definition and succinct explanation; however, some authors use terminology which assumes the reader understands the intended meaning, such as the use of the term silence. As stated, a general consensus of this term in this research area is that no music or any other stimulus was present, but ambient sound is always present, to suggest a state of silence is typically incorrect.

The issues identified in this literature review concerning a lack of blinding and selection bias have informed my approach in this present study, which has been shaped to eliminate them as far as possible. I have chosen to move away from the kennelled environment because of the many issues discussed throughout this review, and not least because there is a distinct lack of literature that includes the domestic dog in its usual surroundings with an owner or carer. Of course, this still does not represent the dog population as a whole, but with such a large populace of our dogs in rehoming centres, it is evident that our relationship with them is not entirely wholesome. A greater acceptance of the need for further research is required to determine the effects of music on pet and owner relationships, to appreciate and begin to understand how music can successfully be included in the lives of both animals and human beings.

Chapter Three

Dog-Walking Task (Musical Intervention)

Introduction

This chapter focusses on personal research findings, investigating the possibility and significance of emotional transmission via the medium of music to companion dogs whilst walking, facilitated through voluntary participation of twelve contributors and their fourteen companion dogs. The participants preferred choice of music is discussed, with particular focus on the emotional triggers, with the aim of gaining context of the influences involved. Reflective accounts of each human participants' personal experience during their participation in the project are given. A discussion of the consequences arising of the impact upon the human–pet dog bond and their interaction within the activity is presented, including topics on demographics, the environment, length of ownership, breed traits, preferred song choice, emotion and behaviours pertaining to questions included in the questionnaire (see appendix 1).

Results of Study and Discussion

Participants were asked to disclose any information relating to their dog's reactive behaviour whilst walking in their usual manner, prior to beginning the research task. A small ethogram of typical dog reactive behaviour was provided, with additional space for further elaboration (see appendix 1, question 11).

Dog Breed	Length of Ownership	Dog Reactivity	Age of Dog	Age of Owner
Working Sheep Dog	9 years 6 months	Pulling on lead, bolting on loud noises.	9 years 10 months	46-55 years
Labrador	5 years	Staring, Pulling on lead.	5 years	46-55 years
Greyhound	9 months	Can go for other dogs, is triggered by other dogs.	4.75 years	66-75 years
Spanish water dog	4 years	Barking, pulling on lead, occasionally barks at other dogs.	4 years 1 month	46-55 years
Poodle cross Bichon-Frise	5 years	Barking, pulling on lead, barking at dogs which are off the lead as previously chased and now nervous. Tends to pull on lead when walked with second dog.	5.5 years	45-55 years
Staffordshire Bull Terrier	4.5 years	Staring, tail between legs, Pulling on lead.	5 years	18-25 years
Cockerpoo	3 months	Jumping	5 months	18-25 years
Cockerpoo	5 years	Barking, pulling on lead.	5 years	46-55 years
Cocker spaniel	3.5 years	Jumping, Barking, Pulling on lead.	3.5 years	46-55 years
Cocker spaniel	3.5 years	Jumping, Barking, Pulling on lead.	3.5 years	46-55 years
Yorkshire terrier	13 years	Barking	13 years	66-75 years
Labrador	9 years	Jumping, Barking, Lunging, Staring, Drooling, Pulling on lead, Yawning.	9 years	46-55 years
Labrador	7 years	Jumping, Barking, Lunging, Staring, Drooling, Pulling on lead.	7 years	46-55 years
Chihuahua	8.5 years	Barking, pulling on lead, Other dogs	8.5 years	46-55 years

Fig 3.1. Demographic information.

Reactive Behaviour Total Number of Dogs = 14 (100%)	Number of Dogs Reported to Exhibit Type of Reactive Behaviour	Percentage of Dogs Reported to Exhibit Type of Reactive Behaviour
Pulling on leash	11	78.6%
Barking	9	64.3%
Jumping	5	35.71%
Staring	4	28.6%
Aversion to loud or sudden noise	1	7%
Drooling	2	14%
Yawning	1	7%
Reacting to other dogs	2	14%

Fig 3.2. Instances of Reactive Behaviour in Dog's as Self-Reported by Owners.

Title	Duration	Genre
Peterloo Overture – Op 97 Malcolm Arnold	10 minutes	Full orchestra
SOS – Portishead	3m 30s	Trip-hop – Ballad
The End of the World – Skeeter Davis	2m 41s	Country/Crossover pop
You're the First, the Last, My Everything – Barry White	3m 52s	Disco
How Long Will I Love You? – Ellie Goulding	2m 44s	Pop Ballad
Iris – Goo Goo Dolls	3m 35s	Pop Ballad
Walls Come Tumbling Down – The Style Council	3m 25s	Political pop
In My Life – Beatles	2m 26s	Pop
Weather to Fly - Elbow	4m 30s	Dream pop
Young Love – Eli Lieb	3m 48s	Pop rock
Moonlight Sonata, First Movement - Beethoven	7m 24s	Romantic
Water Music Suite 1 Handel	25 minutes	Baroque
Miller's Gin/Potato Anxiety – Damien O'Kane & Ron Block	5m 14s	Irish reel

Fig 3.3. Participants' preferred musical choice during participation in walking task.

As can be seen in Fig 3.2, the most prevalent types of dog reactivity reported by the dog owners whilst walking their dogs included pulling on the leash, with 11 out of 14 of the dogs involved in the study reported to have displayed this type of behaviour. Barking was reported in 9 out of the 14 dogs and jumping by 5 out of the 14 dogs. Less frequent instances of reactive behaviours included staring, lunging, aversion to loud or sudden noise, drooling, yawning, and reacting to other dogs. These results demonstrate that leash reactivity remains the most common reactive behaviour reported in dog owners within this study, and that this behaviour may also be accompanied by other actions, such as lunging and jumping, all of which create tension through the leash, which may in turn cause injury to the neck, trachea, and eyes of the dog (Shih *et al.* 2020). Such reactive behaviour may also cause injury to the human. Willmott *et al.* (2011) identified 37 patients who attended either a fracture clinic, emergency department or trauma ward over a two-month period, whose admissions were due to incidences of dog-related musculoskeletal injury. The most common mechanism for such injury was that of being pulled over by a dog on a lead. Moreover, leash reactivity often continues to create problems following the adoption process, therefore hindering the human–animal bond (Pirner and McGlone 2016). It is clear that leash reactivity is an ongoing issue that causes harm to both humans and dogs.

Discussion of Dog Walking Activity

The dog owners were asked to choose a piece a music that triggered some form of emotion within them, to examine the effects of participants own choice of music upon the dog-walking activity. Results concluded that 9 out of 12 of the participants stated that they would consider listening to music whilst walking with their dogs in the future, and of these 9 participants, all reported improvements to their dog’s behaviour, which resulted in there being less tension in the leash. 8 out of 12 of the participants stated that their preferred

musical choice caused them to experience feelings of nostalgia. Further feelings of nostalgia evoked memories from childhood years, or times spent with children in 7 out of 12 of the participants. The following sections provide reflective accounts of the participants involvement in the project and offer some enlightenment in support of these findings.

While listening to their chosen preferred music, several participants recalled biographical moments from their past. Tulving (1972) refers to this as episodic memory, in which explicit or declarative recollection of past events may arise. Brattico *et al.* (2011) state that these recollections and feelings can be prompted by an array of music genres, with or without lyrics. Furthermore, the harmonic, melodic and rhythmic complexities of music associated with episodic memory may vary widely due to diverse cultural and personal choices (Zatorre 2003). The participants' musical choices varied between many different genres, including pop in a variety of sub-genres, country, disco, twentieth-century orchestral, Irish reels, political pop, romantic and baroque orchestral (see fig 3.3). Additionally, their choices were diverse in harmonic, melodic and rhythmic content, which supports the aforementioned findings.

One participant chose the song *SOS* by Portishead, but when the asked if they would consider listening to music whilst walking their dog in the future (see appendix. 1, question 19), the participant stated that they would 'absolutely not', referring to walking two dogs at once and the need for having control combined with the necessary levels of concentration. Walking two dogs together creates its own frustrations aside from participating in any research activity. Dogletics (2022) advise against walking two dogs at once due to the amount of training required to ensure control and safety. The environment becomes altered when two dogs are walked together, somewhat creating a pack situation, causing further stimulation and excitement. The dogs spend far more time bonding with one another than

with the human. Concerns were also raised regarding other dogs being allowed to roam off lead, traffic, runners, and mountain bikers. While these comments do not necessarily demonstrate irritability in the task, it is clear that the challenge of walking two dogs to music whilst wearing headphones was incompatible, considering the many factors which are beyond the owners' control.

A further owner reported feelings of guilt, because they felt unable to share the musical experience with their dog; this also led to their experiences of sadness and depression by the end of the task. This participant chose to listen to the *Peterloo Overture*, which is a portrayal of the events of the Peterloo massacre of 1819, in which a peaceful political meeting was interrupted by military figures, who on government orders injured many people and killed eleven members of the gathering (Faber Music 2021). The work is in two sections and contains much contrast between consonance and dissonance throughout. Musical consonance is referred to as pleasant sounds that are produced by certain combinations of simultaneously played notes; musical dissonance is referred to as unpleasant sounds that are produced by certain other note combinations. In terms of frequency ratio, the simpler the frequency, the more consonant the sound will be (Roederer 1975; Tenney 1988).

There is much musicological research to suggest that negative emotions may be associated with dissonance; furthermore, dissonant chords have demonstrated a higher incidence of negative emotion than consonant chords (Ansfield 2007; Blood *et al.* 1999). The negative emotions experienced by this participant may have been induced initially by the dissonance experienced within their chosen music track, also, the music alternates between the states of consonance and dissonance. Komeilipoor *et al.* (2015) demonstrated that consonant and dissonant intervals affect sensorimotor timing synchronicity in a study involving reciprocal aiming activities whilst listening to both types of stimuli. Results

confirmed that consonant intervals allowed greater success in the given task than dissonant intervals. Furthermore, Bonin and Smilek (2016) state that dissonance in music can interfere with tasks involving cognitive processing. This could suggest that the combination of listening to a long musical piece (ten minutes), which juxtaposes between consonance and dissonance and contains two differing sections whilst maintaining safe control of a dog (which is off-leash) may create a more complex environment, which in turn may not suit all human–pet dog relationships. This discussion provides principal focus of cause, effect, and event in terms of musical content, further debate of musical emotion and the effect it may have upon the listening experience is explored in chapter four.

A further participant stated that they would not consider listening to music again whilst walking their dog because they preferred to concentrate on their ‘faithful friend’. This particular relationship between human and pet dog is obviously very deep and loving, but it is interesting to note that in comparison to all other relationships in the study, it is the shortest, furthermore, the owner is of older years and the breed of the dog is a greyhound (see Fig 3.1). The owner reported that during walks their dog had been known for its reactivity towards other dogs; with this in mind, along with the owner’s age, it is understandable that the owner felt the need for caution and distraction-free walks. Also, Greyhounds generally have high energy levels and can be protective in nature, thus eager to chase (American Kennel Club 2021), a further validation for the owners’ remarks. In comparison, a further participant with a smaller breed Yorkshire Terrier dog stated that they would consider listening to music whilst walking their dog in the future due to the positive nature of their experience during the research task. This breed of dog is much smaller than the greyhound, and in this particular case the owner stated little reactive behaviour other than barking. This is the longest human–animal bond of all participants within the study, suggesting that strong bonds between

humans and animals, which have taken much time to establish, may assist musical intervention in the treatment of both human and dog for behavioural reactive issues.

Participants who listened to music of a lively, uplifting, fun and often romantic nature, stated that they would listen to music whilst walking their dogs again. Their musical choices also contained greater degrees of consonance rather than dissonance. They also remarked on changes in behaviour of their dogs whilst taking part in the task as their own emotions were aroused by the listening task. Most owners reported personal feelings of calmness, relaxation, enjoyment, partial escape from external noise, happiness, peacefulness, nostalgia, and safety. One owner also reported taking time to enjoy dancing across a field, adding how the music had animated her daily dog walk!

Music of a particularly strong rhythmic beat, such as ‘Wall’s Come Tumbling Down’, was reported to offer the participant more pace in their walk, which in turn aided their experience, as rather than the dog pulling on the lead, it too joined the faster pace of the owner.

A further participant reported the pace slowing slightly to the song, ‘The End of the World’, this type of behavioural response could be developed further in areas such as leash reactivity, where dogs and owners are moving too quickly or are anxious in certain situations. A further consideration of this participants’ self-report is that they felt the positive emotions of feeling calm and relaxed whilst listening to the song. As the song’s lyrics focus on the breakdown of a romantic relationship, it is somewhat difficult to understand why this would create such feelings and not leave one feeling quite the opposite. However, Huron (2011) states that although listeners of nominally sad music may genuinely feel sad, some also report positive accompanying feelings.

Environment

Walking a dog links private and public spaces, enabling people from all walks of life to socially engage (Baum and Palmer 2002). Furthermore, the responsibility to provide one's dog with exercise can be the fundamental motivation in the act of dog walking (Degeling and Rock 2012). Question 16 of the questionnaire (see appendix.1), focuses on the environment in which participants chose to walk their dogs, the overall majority of which chose to walk where there was little or no industrial or vehicular traffic, in places such as residential streets, countryside, woodland, small villages, open spaces containing grass land and local playparks and fields. Several studies have investigated the role in which the built neighbourhood environment may act as to facilitate, or to some degree, debilitate the act of dog-walking (Christian *et al.*, 2010; Coleman *et al.*, 2008). For instance, having access to open spaces and supportive park areas with resources that inform dog owners that they are welcome, such as dog waste bins, have been associated with dog-walking behaviour (Christian *et al.*, 2010). In contrast, McCormack *et al.* (2011) suggests that dog-owners who live in more built-up areas may not necessarily walk their dogs as frequently as those who live near open spaces.

A further issue raised in respect to the contrast in recreational spaces and built-up areas was demonstrated by the participants apprehension and aversion to loud and busy environments caused by traffic, other dogs, and people. Traffic sounds, industrial sounds and other such sounds are known as anthropogenic sounds. According to Patricelli and Blickley (2006), anthropogenic sounds are frequently in greater occurrence and generally characterized by higher amplitudes. This is in contrast to ambient sound, such as bird song, the sound of running river waters, wind and rain, and all other sounds existing in nature. One participant stated that their dog was prone to bolting if she heard sudden, loud noises and that they also felt that ambient sounds, such as those relating to nature, for example: bird song and

the wind were preferable to music. These ambient sounds are more difficult to access in isolation due to our environmental soundscapes becoming gradually altered by human activity, such as the building of more homes and the increase in population.

According to Slabbekoorn and Peet (2003), during animal communication, the distances of signals sent may be reduced by anthropogenic sound, thus imposing limitations in the communication process and reception of such signals (Herbert-Read *et al.*, 2017). Consequently, the development of noise sensitivity may occur (Sherman and Mills 2008) and may often result in fearful behaviour, such as an extreme panic response to loud noises, such as children shouting, crying, playing with loud toys and environmental sounds such as thunderstorms, fireworks, and gunshots. Behaviours exhibit in the form of pacing, panting, and trembling, which affect the strength of the human–animal bond and the welfare of the dog.

According to Marston *et al.* (2015), among the various problems which shelter dogs possess, leash reactivity is one of the most common and is a particular form of behavioural reactivity examined in this project. Leash reactivity involves the dog responding to triggers from environments which cause them to feel fear, such as people, sudden loud noises, vehicles, and other objects, which in turn cause them to attempt escape to avoid any contest or consequence; thus, placing distance between the initial threat. According to Rakosky *et al.* (2020), reactive behaviour in dogs may seem aggressive, but in fact it is a reaction to a situation, such as the restriction of the leash when faced with conditions a dog may be unhappy about but unable to retract from (Spooner-Raymond 2021). Nevertheless, reactive behaviour may intensify and become aggressive if not addressed and dealt with in the correct manner. Dogs that display reactive behaviours are over-reacting to specific situations or stimuli which could be triggered by such things as a previous fearful experience, poor

socialization, insufficient training, genetics, or a combination of these; however, fear is often the main underlying cause.

Conclusions

Leash reactivity remains a highly challenging issue for dogs and owners, the consequences of which can be distressing. Oftentimes, correction of these behavioural issues is aimed toward the dog, when in fact we must spend time observing human behaviour in the training of dogs, whilst also learning to be patient. Humans can take a considerably long time to learn new concepts, such as walking and talking, we must therefore understand that a dog's learning to walk on a leash may also take a long time to achieve the confidence and maturity required.

Animal emotion and behaviour has attracted much attention, particular from ethologists who have assisted in the discovery of stimulating findings relating to music and emotion. Musical realisation and appreciation are personal and varies considerably across individuals due to the subjective nature of the matter.

This research study involved a total of 12 human participants; 10 of whom walked with only one dog and 2 who walked with 2 dogs each. It became evident that walking with two dogs was a very different situation than walking with one dog, and for one of these participants, the circumstances which arose during participation in the task became overwhelming. This would indicate a fault in my study design, and with hindsight I would limit the activity, allowing owners to walk only one dog at a time. This would enable the owner to focus on participation in the given task; thus, facilitating any processes or effects which may occur as a direct influence of sharing time with their companion dog.

There is evidence to suggest that listening to preferred music of any genre which is pleasant in nature and more consonant rather than dissonant in tonality could provide valuable intervention in the human–animal bond. Whilst listening to preferred music,

therapeutic effects upon both human and non-human are possible, allowing both species to receive hidden benefits. These may be in the form of feeling more relaxed and calmer, and feeling happy or feeling nostalgic, which in turn may influence the human emotional state. Furthermore, the choice of music in this study provided a function, not only to accompany participants on their walk, but also to invoke thoughts, feelings and emotions, memories, and in some cases a change in the pace of the walk. Music also provided companionship which could negate loneliness. Additionally, the participants who have never listened to music whilst walking their dogs may continue to do so providing their experience was positive.

Listening to music whilst walking dogs is a cost-effective non-invasive process that may facilitate the bonding process between human and dog. However, from this small study it cannot be seen that leash reactivity has been greatly improved, although some owners did suggest that their dogs did walk more cooperatively. There is opportunity to build upon these conclusions and develop further research activities within the discipline of the human-animal bond.

Chapter Four

Musical Companions: Emotive Encounters.

Our human society affords dogs many unique opportunities and places in which to create social bonds, such as living within a family unit as a much-loved pet, becoming working farm dogs, and serving as assistance dogs. Moreover, the shared lives of humans and dogs has been well researched and documented. This final chapter elucidates upon my research project documented in chapter three, and relates to the ways in which music, and the emotion that may be conveyed when listening to music, may affect the human pet-dog bond. Contextual information of the early evolutionary events of the human-dog relationship is discussed to facilitate further discussion of attachment theory and emotive issues. The anecdotal evidence provided during owner participation in the research study is also further explored, examining owner attitude, emotions, songs, musical characteristics, and specific behaviours of both human and pet-dog.

Context

According to Scott (1967: 374), social selection is somewhat responsible for the evolution of dogs over a period of many years, and the relationship that forms between dogs and humans can be a very powerful and social one. It is believed that dogs were the first species to be domesticated by humans (Coppinger and Coppinger 2001); however, there are many hypotheses on this topic, but it would be fair to suggest that one of the primary activities which both humans and dogs similarly benefitted from, was the act of hunting, by making use of species-specific skills. Due to the increased success in hunting, humans began to share portions of the hunted food with the dogs; the shared involvement between humans and dogs then fashioned a form of self-domestication. (Grayson and Meltzer 2002). As domestication in dogs evolved, dog's social behaviour also began to develop; the

temperament of some dogs began to change by demonstrating lower levels of fear and aggression towards humans, which was particularly helpful when humans began to settle and establish agricultural environments (Axelsson *et al.*, 2013).

A consequence of dogs' evolution into the domestic environment, is that further, more complex behavioural changes took place due to the heterospecific social groups which the human social system provides (Miklósi *et al.*, 2004; Miklósi & Topál, 2013). According to Hare and Tomasello (2005), due to a dogs' higher capacity for attention towards humans, yet reduced emotional reactivity, dogs may have achieved a higher ability to understand human communicative gestures. These human social connections, which began primarily as human-animal interactions, developed due to the like-minded behaviour of humans and the welfare of their animals (Wood *et al.*, 2005).

Since these evolutionary events, humans and dogs have proceeded to share their lives, often forming long-lasting intense bonds which have created much interest in many research communities. Hare and Tomasello (2005) and Tomasello and Kaminski (2009) suggest that dogs form an infant-like bond towards humans who are their caregivers. Further research to support this opinion states there is evidence that primarily, female pet-owners often speak to their dogs as though they are small children, likening this type of language to 'baby talk' (Hirsh-Pasek and Treimann 1982); (Mitchell 2001); (Burnham *et al.*, 2002); (Prato-Previde *et al.*, 2006). Also, according to Katcher and Beck (1983), these owners also cuddle their dogs, maintaining physical contact with them (Serpell 1986).

An evolutionary concept of these bonding behaviours could be explained by John Bowlby's attachment theory, which suggests that due to survival instincts, humans are physically and psychologically pre-determined to form attachments with other humans. Thus, children have an innate requirement to bond with a main caregiver within a specific period;

failure to do so may result in negative experience, such as long term cognitive, social and emotional difficulties (McLeod 2017). Bowlby was influenced by the work of Lorenz (1935), who investigated imprinting mechanisms in goslings. A batch of goose eggs which were ready to hatch were separated into two halves; one half placed under a mother goose, while the other half placed in an incubator. Lorenz ensured that he was the first object the goslings would see when they hatched out of the incubator, and that he would mimic the sounds of a mother goose. Likewise, the mother goose would be the first object the goslings would see that hatched beneath her. As the goslings hatched and developed, they began to follow the first moving object they saw, which is known as imprinting, and suggests that attachment is innate and a consequence of genetics. Lorenz also believed that imprinting is non-reversible.

According to Levinson (1969), some pet owners tend to experience love and acceptance from their animals, and that their pets love and accept them unconditionally. Additionally, feelings of tenderness, loyalty, warmth, consistency, and stability are also conveyed within the human–pet relationship (Hirschman 1994); (McNicholas and Collis 1995). According to Carver (2019), the love and devotion which people demonstrate towards their animals is increasing globally. Frequently people enjoy the companionship of an animal, take them for walks and spend time talking to them. Evidence also suggests that attachment to companion animals may aid human health and well-being and help to foster community spirit. Mills and Hall (2014) further acknowledge that companion animals do provide value to human life in ways which benefit human health, both mentally and physically. They also discuss the issues around animal assisted interventions in healthcare environments and the ways in which these could facilitate the patient journey. Furthermore, they argue that the economy may also benefit from such interventions. These behaviours can lead to strong attachment between humans and animals, and for animals to become important members of a family unit.

In a study of Spanish primary school children exploring the mental capabilities of eight different species, including the dog, human, chimpanzee, cow, otter, sparrow, fish and frog, dogs and humans were rated as the most sentient beings (Menor-Campos *et al.*, 2018). There is an increasing body of evidence which demonstrates that animals can give some sense of security in terms of attachment relationships for both adults and children, and that strong emotional bonds may also form in respect of this. For example, Beck and Madresh (2015) found that when comparing relationships with romantic partners to relationships with pets, pet relationships were rated more secure and provided a more dependable source of attachment security.

Researchers have made good progress in the study of animals and emotion. DeMello (2012: 362) acknowledges the role of ethologists, in that they accept the sharing of primary emotions, such as happiness, fear, anger, surprise and sadness between humans and animals. These primary emotions are the experiences first encountered following a change to the environment or situation (Parvez 2021). To further illuminate, many ethologists view animals as also sharing many of the secondary emotions with humans, such as jealousy, longing and regret, and these secondary emotions form as a reaction to the initial primary emotion. Unlike humans, dogs are not likely to hide their emotions, and we can observe their behavioural indicators of such emotions in their species typical actions of wagging tails, ears standing tall and play bows. The primary emotions are those which we can readily make sense of, just by assessing a dog's posture, facial expression, gaze, and vocalisation, but the secondary emotions are often much less obvious, for example, empathy; dogs establish empathy as a significant secondary emotion, as this type of emotive understanding demonstrates consideration and care for others (Bekoff 2007: 11, 45). However, the way in which humans may perceive this gesture is often subjective.

Measuring and assessing the feelings of animals is somewhat difficult, as they cannot speak to us and their behaviours cannot always be directly observed according to specific emotions. However, dogs are similar to humans in their necessity to read certain emotions in order to receive benefit in terms of their social and emotional relationships. Indeed, this ability holds immense adaptive variation, which in turn supports both the human and dog, especially in the domestic environment (Schmidt and Cohn 2001).

Emotions

A human emotion arises when internal concerns or feelings are affected by external actions, typically concerning other humans. Occasionally, internal concerns can be affected by internal thoughts. Emotions are processes which give rise to actions or thoughts while consigning all other thoughts or actions to lower levels of relevance. Sometimes emotions are accompanied by physical actions (Oatley 2019). Additionally, an emotion may be a subjective feeling or expression that can last either momentarily or for a prolonged length of time (Juslin and Sloboda 2010: 1;108). For instance, imagine you are in a busy shopping centre and have realised you do not have your purse or wallet about you in order to pay for a purchase you wish to make. You cannot remember if you put it in your bag or not and begin to wonder if you left it at work or home. Time stops, and your heart starts to thump hard in your chest. Suddenly you receive a phone call from a work colleague notifying you that you had left your purse on your desk at work and that they have stored it safely in your locker; all is well, but you cannot stop thinking about the implications of the events. The emotion is fear from the concern for the safety of the lost belongings and the event of the misplaced item.

Musical Emotion

There have been numerous attempts to comprehend the meaning of musical emotions, and there are many aspects to consider when aiming for some conclusion. According to Gabrielsson (2002), emotions may be perceived or felt in response to music, and those emotions are not necessarily the same for all. One reason that humans engage with music, is because of the ability it has to evoke emotion; in brief, this is what a musical emotion is; emotion that is induced via the medium of music (Juslin and Sloboda 2010: 1;108). Certain songs can trigger memories, express inner feelings, cause physical actions such as crying and even allow the shared emotional states between others, such as composer and performer. Nevertheless, hearing music is a frequent experience for much of the population, for instance, in shopping centres, restaurants and workplaces, where no emotion may be triggered at all (Juslin and Laukka 2004).

According to Juslin (2013), there are two classifications of emotion to consider, with underlying themes: everyday emotions, and aesthetic emotions. Everyday emotions are similar to those experienced in everyday life, such as happiness, sadness, interest and surprise, whereas aesthetic emotions can include nostalgia, tenderness, tension and wonder; however, these emotions are not unique to music. Also, everyday emotions and aesthetic emotions can both occur together; thus, mixed emotions are not uncommon. The following paragraphs focus upon everyday emotions, aesthetic emotions, and mixed emotions respectively, with reference to some of the preferred song choices of the dog owners cited in chapter three (see fig 3.3).

Songs which evoked only everyday emotions in participants during the dog-walking activity, were the *Peterloo Overture*, *You're the First, the Last, My Everything*, *How Long Will I Love You?* *Iris*, *Walls Come Tumbling Down* and *Miller's Gin/Potato Anxiety*. Songs

which evoked only aesthetic emotions in participants were, *The End of the World*, *SOS*, *Moonlight Sonata*, *Water Music Suite One*. It would seem from this small sample, that the occurrence of everyday emotions in music listening is more common than that of aesthetic emotions. In support of these findings, a study of 762 Swedish citizens between the ages of 18 and 65, where both general musical emotions and the most recent episode of emotion were explored. Results demonstrated that happiness, sadness, and nostalgia were the three main emotions reported. In contrast, aesthetic emotions, such as awe and wonder were seldom conveyed by listeners (Juslin *et al.*, 2011). Also, a study of 32 college students ranging from 20 to 31 years of age listened to episodes of sound and music at random times during the day when signalled to do so. Results demonstrated that in 64% of the music episodes, students experienced emotional response; these included feelings of happiness and nostalgia (Juslin *et al.*, 2008). Zentner *et al.* (2008) described more instances of aesthetic emotions where listeners were exposed to classical music. This may support my findings, as *Moonlight Sonata* and *Water Music Suite One* were described by participants as only evoking aesthetic emotions. These types of music are often referred to as classical by the general listener.

For an individual to make any sense or judgment about the emotional content of any musical excerpt, one must consider the subjective nature of music itself, and the different values and opinions individuals may have. According to Juslin (2013), when music is evaluated subjectively, as though it were a piece of art, using an individual's personal set principles or criteria, this is making an aesthetic judgment. Certain music will cause higher levels of aesthetic judgment than others, and some may cause no judgment whatsoever, as was the case in the song, *Young Love*. Aesthetic judgment relies on listener attention, knowledge, and the characteristics of the situation. Furthermore, the same song may be heard by different listeners, with each one gaining a different emotional response, as not all listeners will necessarily have an aesthetic experience.

Mixed emotions are also possible, as was conveyed by a participant who chose the song *Iris*. The participant described feelings of positivity, reflection, and comfort, yet also feelings of melancholy. The song was chosen because it triggered memories of her unborn son who sadly passed away. The music induced mixed emotions and wide-ranging feelings of sadness, yet pleasure. According to Levinson (2004), everyday life is filled with a combination of events that may vary in appeal, and we become accustomed to the fact that life often offers good and bad. Therefore, music which reflects the poignant quality of certain life events can often cause much emotive response.

A piece of music may be perceived to be happy due to the fast tempo, levels of consonance compared to dissonance, or nature of the lyrics, such as *We wish You a Merry Christmas* (ClassicFM 2022), which speaks of the good cheer of Christmastime, but if memories of a particularly difficult or sad Christmas were triggered by hearing this song, then the song would induce feelings of sadness instead. A favourite song for a particular participant was, *You're the First, the Last, My Everything*, with whom they shared many happy memories of laughter and dancing with their daughter. The song also reveals positive lyrics, an upbeat tempo, is of declarative mood and is dedicational in manner, providing secure consonance. However, a song could induce sadness by triggering a specific sad memory in the listener.

Walls Come Tumbling Down, was chosen by one participant, as they had happy memories of the song from listening to it as a child. They had a positive experience in the dog-walking task, remarking that listening to the music allowed them to block out some of the environmental sounds while they reminisced of their childhood days. Bolders *et al.* (2012) refers to this as evaluative conditioning; the process whereby an emotion is induced because the particular piece of music has frequently been associated with other positive or negative events. For instance, as a child you had a favourite song that you shared a particular

fondness for with a group of friends, and the repeated occurrence of meetings and listening to the particular song built up feelings of happiness and joy. With the passage of time, the recurrent action will lead to a feeling of happiness whenever the song is heard, regardless of whether the group of friends is there or not. Evaluative conditioning is interesting since it involves subconscious, unintentional, and effortless processes that can be subtly affected by mundane musical events (Razran 1954).

According to Baumgartner (1992), when music evokes a personal memory or specific event in a listener, the process of episodic memory also occurs. When the memory is evoked, the emotion associated with the memory is also evoked and may be strong, due to memories of original events associated with the music and physiological responses which may have also occurred in the past (Lang 1979). Emotions such as nostalgia are often associated with episodic memories (Janata *et al.*, 2007).

According to Gavin and Mandler (1987), specific songs can trigger firm biographical memories, which may date back many years and relate to sadness, nostalgia, and regret. Nostalgic feelings were most commonly reported, followed by sadness and regret. These are also known as forms of secondary emotions and are a consequence of actions or events which have hitherto taken place. For example, *How Long Will I Love You*, was a particular song choice for one participant, because its evoked feelings of nostalgia for their late Mother. They stated that their initial feelings of sadness and grief have now been replaced by pleasant feelings and nostalgia, as the participant has now become immersed in the lyrics of the song, as they are the words they wish to express to their Mother. Some of these nostalgic experiences were associated with the emotions of both happiness and sadness. In a study by Barrett *et al.* (2010), participants rated levels of nostalgia in randomly selected popular-music excerpts. Feelings of nostalgia were dependent upon familiarity of the music,

arousal due to the music, whether the music elicited higher levels of positive, negative, or mixed emotions and whether biographical experiences were also prompted. However, in this same study, music which did not prompt nostalgic or biographical experiences was associated with irritation. According to Kivy (1990), listeners perceive musical emotions, such as sadness, but may confuse these perceived emotions with actual emotions felt when listening to music and do not actually feel sad; consequently, these listeners will somewhat experience a pleasurable emotion. Juslin *et al.* (2014) and Vuoskoski *et al.* (2012), stated that sad music can stimulate several other emotions within the listener, such as peacefulness and nostalgia, and that these incidences are considered typical for some listeners. However, Huron (2011), states that genuine sadness is also experienced by listeners, and that this too may be a pleasurable experience for them.

Communication and bonding may also occur through music, and research has established that shared music preferences form and strengthen social bonds (Knobloch, Vorderer and Zillmann (2000); Lonsdale and North (2009)). One participant's musical choice was *Miller's Gin/Potato Anxiety –Damien O'Kane & Ron Block*, stating that whilst involved in the dog-walking activity they felt a sense of calm and peacefulness, which was helpful for feelings of anxiety, but that this also provided them with bonding time for them and the dog, and that this was pleasurable and relaxing for both the participant and the dog. Bonding may occur not only in human-human relationships through music, but also in the human-animal relationship.

Conclusion

It is evident that the domestication events of dogs assisted in their social and behavioural developments, not only with other dogs, but also with humans. As human life evolved, so too did that of the domestic dog, and we now experience shared environments which cater for both human and dog to a large degree. The veterinary research community have demonstrated much interest in dogs' abilities to understand the world, and the ways in which they communicate. Furthermore, there is increasing interest in the subject of human-animal interactions, and the bonds which may form between animals and caregivers. It is normal to see dogs' receiving petting behaviours from their owners, such as cuddling and 'baby talk', and these behaviours may influence the formation of strong attachments and intense relationships with animals. Indeed, owning a pet is not only about giving love, but also the receiving of love and acceptance that seems to be of importance to owners, and the fact that there is an element of unconditional love that perhaps cannot be sought from any other source?

The human-pet bond may also facilitate well-being and provide much value to both human and animal life. School interventions including animals can increase feelings of security in terms of learning how to form attachment relationships, and how to behave when animals are present, thus informing children of animal welfare policies at an early age. Also, merely walking a dog can increase the chance of interaction with other human beings, thus benefitting mental health as well as physical health. These types of activities can also unite family units and foster improved life choices.

The responsibility of owning a pet will inevitably bring about emotion due to the attachment aspects involved. From an ethological point of view, it is understood that animals do share many of our human emotions, such as the primary emotions of happiness, fear,

anger, surprise, and sadness, but that they also share feelings of jealousy, longing and regret. Also, animals may indicate their emotions more readily than humans, such as when a dog wags its tail or pricks up its ears to display eagerness at the arrival of its owner. Of course, emotions are subjective, and assessing the feelings of humans or animals can be somewhat difficult at times, for both species, but it an important feature of communication and necessary for social and emotional development.

Musicological research has highlighted certain classifications of musical emotion, and there is ongoing study in this field of enquiry; however, one rule of thought is that there are everyday emotions, such as happiness, sadness, fear; and aesthetic emotions, such as melancholy, relaxing, and haunting. It is thought that everyday emotions are induced by music more generally, as was the case in my research task, but it was a small sample, and I cannot draw any wider conclusions from this. Additionally, the subjectivity of music is also important, as what one listener finds emotional in content, another will perhaps not. It is human nature to be subjective and have opinions, likes and dislikes, as such, forming aesthetic judgment of musical choices is very individual.

Musical features and characteristics, such as consonance and dissonance all have important roles when considering musical emotions, and can define everyday, aesthetic, and mixed emotions, as pieces will sometimes vary between states, thus changing the emotional status of a piece throughout the duration of play. Additionally, musical emotions may evoke biographical memories or shared memories. Some of these biographical memories were used to assist in participants musical choice in the walking task for which they had perceived emotional ideologies. For some participants these were realised, but for others they were not; hence, further thought and preparation for the activity may have proven useful, however, one can never necessarily predict what an emotive response may be.

There are no firm conclusions to engage with in terms of the bonding process between humans and pet-dogs partaking in the dog-walking activity, but the reflective, anecdotal accounts of owners' time spent listening to music whilst walking with their pet-dogs was informative and illuminating. All owners' felt a sense of contribution and commitment in terms of research and made decisions of whether or not they were likely to repeat the activity.

This small ethnomusicological project has allowed the exploration of an array of musical concepts within a group of people, and to gain some understanding of the functionality that music has in their lives with their pet-dogs. The emotions that we feel in everyday life may be induced or perceived in response to music, and for many, this is the reason why we engage in musical activity. Music can trigger certain memories or enable the expression of feelings and thoughts and can even cause physical reactions. In contrast, we go about our daily lives and may even ignore music; perhaps in large spaces, such as the supermarket, and feel no emotion. Nonetheless, music has the ability to effect change within society.

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Appendix One

Dog Walking Questionnaire

Thank you for participating in my research into Human animal Interaction and Music.

For this study you are required to choose a piece of music to listen to through earbuds or headphones whilst walking your dog in a safe environment. Please choose a piece of music that is emotionally significant to you. Take some time to read through this questionnaire and answer questions 1 to 12 before commencing your walking and listening activity.

Please begin your walk in your usual manner without the music, then walk for 3 mins in complete silence unless for safety reasons you need to break this silence.

Following the silence begin to listen to your chosen piece of music whilst continuing with your walk, and if possible, continue to listen right to the end of the piece. Again, please bear safety in mind and pause or end the listening process if necessary.

Answer questions 13 to 19 following this activity.

Thank you once again for your valuable participation.

Questions to answer before taking part in your walking and listening activity.

Questions regarding yourself as the owner of your dog.

1. How old are you? 18 – 25 26 – 35 36 - 45
46 - 55 56 - 65 66 - 75 75+

2. Your Gender? Prefer not to say

3. Are you the main carer for the dog?
Yes No 50/50

4. Are you the person normally responsible for taking the dog on walks?
Yes No 50/50 Usually walk as a pair or group

Questions relating to your dog.

5. How old is your dog?

6. What is the breed of your dog?

7. How long have you owned your dog?

8. Is your dog: Male Female

Neutered Spayed N/A

9. How often do you normally walk your dog?

10. Do you feel your dog is reactive at all whilst out walking? For example, does he/she exhibit any of the following behaviours (this list is not exhaustive).

Jumping Barking Lunging Staring

Drooling Tail between legs Pulling on lead

Please add any other behaviours you feel important to note.

11. Do you feel certain behaviours are triggered by particular objects such as cars, bicycles, loud machinery, or from people, in particular children, men or women specifically?

12. What about your emotional state whilst your dog behaves in such a way? Can you please comment. If it is easier to just add bullet points or short phrases or even words, this is perfectly acceptable.

Questions to answer following your walking and listening activity.

13. What was the title of your chosen piece of music for your walking and listening activity?

14. Please could you give a brief account as to why you chose this particular piece of music, paying particular attention to the emotions the music may have evoked in you whilst you were walking with your dog. Please feel free to also comment on any other aspect you feel you would like to about the musical experience whilst walking with your dog.

15. What type of area were you walking in? What were your surroundings like? For example, were you walking in the suburbs, an urban area, the countryside? Was it peaceful, busy, noisy, were there many other people around or dogs? Did the environment contain noisy traffic at all? Any information would be really helpful thank you.

16. Do you feel the environment aided your listening experience? Can you please elaborate on your answer if possible?

17. Whilst you were engaged in the walking and listening activity with your dog, did you notice a change in your dogs' behaviour at all? This may be his/her reactivity to certain triggers, a change in tension on the lead, their general emotional state or any other changes or nuances you may have noticed.

18. What about your emotional state whilst engaged in this activity? Could you please write a few words to describe how you felt during the process please?

19. Would you consider walking your dog and listening to music in the future? Please take a few moments to explain your answer.