

MUSIC CREATION AS A TOOL FOR POSTPARTUM MOTHERS

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ABSTRACT

This dissertation uses Artistic Practice as Research to investigate the potential use of music creation as a tool for mothers with postpartum depression (PPD), incorporating my own experiences as a composer and mother with PPD through retrospective autoethnography, and culminating in the creation of a new music composition. To inform this work, I conducted an analysis of research into music-based therapies for postpartum depression, which revealed gaps, as well as inconsistent use of terms and practices. This dissertation argues that active music creation deserves further study as a distinct form of music-based intervention and identifies maternal self-efficacy and functional connectivity as pathways for further investigation.

I developed a method of teaching music creation to postpartum mothers, combining principles of Neurologic Music Therapy, music pedagogy, and compositional practices, and conducted an exploratory case study with one mother. Using the same method, I created a new musical piece to process and artistically communicate my own past experiences with PPD. By investigating interdisciplinary connections between neuroscience, pedagogy, and artistic practice, this dissertation explores a music creation-based therapeutic approach centered on maternal lived experience, and identifies directions for future empirical research.

RÉSUMÉ

Cette thèse s'appuie sur la recherche par la pratique artistique (Artistic Practice as Research) afin d'examiner le potentiel de la création musicale comme outil pour les mères souffrant de dépression postpartum (DPP). Elle intègre mes propres expériences de compositrice et de mère ayant vécu une dépression postpartum, dans le cadre d'une démarche autoethnographique rétrospective, et aboutit à la création d'une nouvelle œuvre musicale. Pour éclairer cette démarche, j'ai effectué une analyse des recherches portant sur les thérapies faisant appel à la musique dans le contexte de la dépression postpartum. Cette analyse a révélé des lacunes dans la littérature ainsi que des incohérences dans l'utilisation des termes et dans les pratiques décrites. Cette thèse soutient que la création musicale active mérite d'être étudiée davantage en tant que forme distincte d'intervention fondée sur la musique et identifie le sentiment d'efficacité personnelle maternelle et la connectivité fonctionnelle comme pistes de recherche à approfondir.

J'ai élaboré une méthode d'enseignement de la création musicale destinée aux mères en période postpartum, combinant des principes de la musicothérapie neurologique, de la pédagogie musicale et des pratiques de composition, puis j'ai réalisé une étude de cas exploratoire auprès d'une mère. En utilisant cette même méthode, j'ai créé une nouvelle œuvre musicale afin de travailler sur mes propres expériences passées de dépression postpartum et de les communiquer par la pratique artistique. En examinant les liens interdisciplinaires entre les neurosciences, la pédagogie et la pratique artistique, cette thèse explore une approche thérapeutique fondée sur la création musicale et centrée sur l'expérience vécue des mères, tout en proposant des orientations pour de futures recherches empiriques.

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Introduction

When my oldest daughter was born twenty-one years ago, I experienced a period of approximately eighteen months of severe postpartum depression that gradually waned over the subsequent year. When my younger twins were born, the period of depressive symptoms lasted for approximately two years before fading. I initially attributed my symptoms to a combination of life circumstances, events, and personal failings. Thankfully, my lifelong tendency toward reading and research led me to understand that these were not the fundamental causes of my distress, and also, that I was not alone in my experience.

Close to one in five new mothers worldwide experiences symptoms of postpartum depression, or PPD, including persistent sadness, thoughts of worthlessness, difficulties with executive function and mood regulation.¹ This figure holds true for mothers worldwide, in all countries where maternal mental health is measured, and from all backgrounds and life circumstances.² Any mother can be affected, whether wealthy or poor, married or single, older or younger, and from any background, as can their children and families.³

¹ Kathleen Kendall-Tackett, *Depression in New Mothers: Causes, Consequences, and Treatment Alternatives* (Routledge, 2016).

² Carmen Knudson-Martin and Randi Silverstein, "Suffering in Silence: A Qualitative Meta-Data-Analysis of Postpartum Depression," *Journal of Marital and Family Therapy* 35, no. 2 (2009): 145–158, <https://doi.org/10.1111/j.1752-0606.2009.00112.x>.

³ Jennifer Hahn-Holbrook, Tia Cornwell-Hinrichs, and Itzel Anaya, "Economic and Health Predictors of National Postpartum Depression Prevalence: A Systematic Review, Meta-Analysis, and Meta-Regression of 291 Studies from 56 Countries," *Frontiers in Psychiatry* 8 (2018): article 248, <https://doi.org/10.3389/fpsy.2017.00248>.

Knudson-Martin and Silverstein, "Suffering in Silence."

Susanna Banti et al., "From the Third Month of Pregnancy to 1 Year Postpartum: Prevalence, Incidence, Recurrence, and New Onset of Depression; Results from the Perinatal Depression—Research & Screening Unit Study," *Comprehensive Psychiatry* 52, no. 4 (2011): 343–351, <https://doi.org/10.1016/j.comppsy.2010.08.003>.

Although therapies have significantly improved over the past forty or so years, PPD still does not have its own diagnosis in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders,⁴ also known as the DSM-5, the manual used by clinicians and therapeutic professionals in the United States and Canada to diagnose depression and other affective disorders. The diagnostic criteria in the current edition of the International Classification of Diseases and Related Health Problems of the World Health Organisation, the other international standard diagnostic manual for clinicians, does not truly define any condition as being specific to postpartum mothers. Instead, it references other mental health conditions and adds “with postpartum onset.”⁵ Although there are diagnostic tools specific to postpartum women,⁶ these gaps in diagnostic criteria, coupled with an ambiguous boundary between a typical postpartum experience and one in which a mother requires interventional help,⁷ can make it challenging both for clinicians to diagnose PPD, and for mothers to feel sure they are even experiencing it at a level that warrants help. More information and research into PPD as a unique and separate condition from other depressive disorders would greatly benefit mothers, children, families and society.

This dissertation seeks to center the maternal experience in generating research directions for PPD, specifically research into the potential benefits of teaching mothers with PPD to create

⁴ Katherine L. Wisner, Eydie L. Moses-Kolko, and Dorothy K. Y. Sit, “Postpartum Depression: A Disorder in Search of a Definition,” *Archives of Women’s Mental Health* 13, no. 1 (2010): 37–40, <https://doi.org/10.1007/s00737-009-0119-9>.

⁵ World Health Organization, “International Classification of Diseases 11th Revision,” accessed April 29, 2026, <https://icd.who.int>.

⁶ John L. Cox, Jeni M. Holden, and Ruth Sagovsky, “Detection of Postnatal Depression: Development of the 10-Item Edinburgh Postnatal Depression Scale,” *British Journal of Psychiatry* 150, no. 6 (1987): 782–786, <https://doi.org/10.1192/bjp.150.6.782>.

⁷ Kendall-Tackett, *Depression in New Mothers*, 3.

their own music, both as a tool for emotional regulation, and as an artistic means of cognitive reframing. To accomplish this goal, this interdisciplinary thesis works under the umbrella domains of Artistic Practice as Research and retrospective autoethnography, reflexively drawing on my experiences as a music student, composer and mother with postpartum depression.

Autoethnography is a domain of study in which the researcher is explicitly not separate from the research itself. In autoethnographic research, the writer endeavors to “describe and systematically analyze (graphy) personal experience (auto) in order to understand cultural experience (ethno).”⁸ In the 1980s, researchers Arthur Bochner and Carolyn Ellis began attempting to formalize the understanding that vocabularies, subjects, hypotheses and outcomes of research were all inextricably connected to the societies from which they originated. Bochner and Ellis were forerunners of a discipline that sought to make the subjective experience of the researcher a relevant and legitimate piece of the research inquiry. I use this method in Chapters 3 and 5 to bring my own experiences into the realm of generating inquiry and knowledge and to complement and engage with the empirical information about PPD also discussed in this dissertation.

To anchor my research, I drew from and synthesized theoretical and practical research in the domains of Neurologic Music Therapy, neurological and neuropsychological research, the pedagogies of music, art and creativity, and social science research. In particular, my pedagogy of music creation draws on the work of Pat Pattison,⁹ and my method of discussing student work

⁸ Arthur P. Bochner and Carolyn Ellis, *Evocative Autoethnography: Writing Lives and Telling Stories*. (Routledge, 2016).

⁹ Pat Pattison, *Pat Pattison*, accessed April 14, 2026, <https://www.patpattison.com/>.

and creativity is based on the work of Carol Dweck, who defined and popularized the concept of a *growth mindset*.¹⁰

I devised an intervention based on the principles of Neurologic Music Therapy, a discipline developed by Michael Thaut and Shannon d'Etoile,¹¹ drawing from my own experiences as a music student, researcher and pedagogue, and composer and songwriter with PPD. The intervention sought to investigate two research questions: first, what can maternal lived experience and Artistic Practice as Research reveal about the potential of music creation in developing therapeutic approaches for postpartum depression, and second, what could an exploratory case study suggest about both feasibility and potential directions for future empirical research based on that potential? I hypothesized that mothers would experience and self-report benefits in mood and self-concept after a six-week intervention. I experienced difficulties with recruitment, but was able to complete a case study piloting my intervention with one young mother experiencing PPD.

The two products of my research are this dissertation, and an accompanying piece of original electroacoustic music, titled “Carrying,” which the reader may listen to [by clicking here](#). “Carrying” is a work of Artistic Practice as Research, using both Artistic Practice as Input and Artistic Practice as Output,¹² that further processes my own past experiences with PPD, and generates knowledge and a mode of communicating information about those experiences. I created the piece through implementation of the pedagogy that I developed for my study design.

¹⁰ Carol S. Dweck, *Mindset: The New Psychology of Success* (Ballantine Books, 2007).

¹¹ Michael H. Thaut and Volker Hoemberg, eds., *Handbook of Neurologic Music Therapy*, 1st ed. (Oxford University Press, 2014).

¹² Darla Crispin, “Artistic Research and Music Scholarship: Musings and Models from a Continental European Perspective.” In *Artistic Practice as Research in Music: Theory, Criticism, Practice*, edited by Mine Doğan-ı Dack, 53–72. (Ashgate, 2015).

“Carrying” contains information about my experience with postpartum depression, and is intended as a means of communication, as a demonstration of a research method, and as a piece of music that stands on its own.

This is an interdisciplinary thesis, and it is deliberately written with an awareness of all the potential readers who might engage with it. To make the contents of this thesis as accessible as possible to as wide a readership as possible, I have made several choices in the writing and structure, and I will discuss them here so that readers from different disciplines and backgrounds will have expectations that are aligned with what they are about to read.

First, this dissertation largely employs the form and style of a humanities discipline, and I use a plain and sometimes conversational writing style. I do this because it is my view that discipline-specific jargon can sometimes obscure clear communication, and also because I would like to make the work accessible to readers from both within and outside academic settings. Second, autoethnography is one of the methods used in this dissertation. Rather than attempting to present myself as an unbiased observer, I foreground my positionality as a mother and composer within the research. Accordingly, the dissertation includes narrative vignettes drawn from my own experience, including in chapters that also take analytical approaches to sociological or theoretical questions. Third, in the chapters that deal with empirical research, I have attempted to present the information as neutrally as possible and to differentiate my own views from evidence I am presenting, but I do not claim not to have a position or a stake in the matters being discussed.

In their work “The Artistic Turn,” discussed extensively in Chapter 4, researchers Kathleen Coessens, Darla Crispin and Anne Douglas discuss the tensions, differences and similarities between scientific and artistic research, and the development of human knowledge:

In developing knowledge, the human being is neither an exclusively passive receiver who simply re-arranges what already exists, nor a solitary, isolated creator who brings something entirely new into existence. Rather, he or she represents a blend of the two in which a degree of uniqueness arises from the proportions in which the blend is created. Thus, for example, the artist as researcher develops characteristic, individual and – in the true spirit of research — original ways of drawing together and synthesising his or her observations of phenomena from a world that embraces both objective and subjective forms of knowing but also transcends these categories.¹³

This dissertation is written with this as a goal: to synthesize and blend both objective (empirical) and subjective (experiential and artistic) “forms of knowing” in the service of more fully exploring and identifying research directions for new therapeutic approaches to postpartum depression that center the maternal experience.

Literature Review

As this is an interdisciplinary thesis, the literature review section of this introduction covers many different domains. I offer here a brief overview of the central literature for these domains; each chapter will then situate a portion of my research in a particular domain or overlapping domains, and include a detailed review of the sources that informed my work. The chapters of this dissertation work together cumulatively rather than each standing independently. Each chapter will develop part of the framework for the inquiry that follows. For example,

¹³ Kathleen Coessens, Darla Crispin, and Anne Douglas, *The Artistic Turn: A Manifesto* (Leuven University Press, 2009), 47.

Chapter 3 examines cultural and educational beliefs about musical ability to establish a context for understanding why music creation may not feel equally available to all people. The autoethnographic narrative in Chapter 5 does not attempt to reproduce the information in Chapter 3; rather, it examines how some of those same cultural assumptions interacted with motherhood, depression, music and creative practice in my own experience.

Neurology

There are neurological changes specific to a new mother's brain that look similar on the surface to patterns of neural activation associated with depression, but these changes occur even in the absence of postpartum depression.¹⁴ The amygdala in particular appears to play a different role in the postpartum brain than it does in the general population, or in major depressive disorder (MDD) and other affective disorders.¹⁵ In general, hyperactivation of the amygdala is considered to be correlated with depression,¹⁶ and one metric of success for pharmacological

¹⁴ Pilyoung Kim, Lane Strathearn, and James E. Swain, "The Maternal Brain and Its Plasticity in Humans," *Hormones and Behavior* 77 (2016): 113–123, <https://doi.org/10.1016/j.yhbeh.2015.08.001>.

¹⁵ Goran Šimić, Mladenka Tkalčić, Vedrana Vukić, Dora Mulc, Ena Španić, Marina Šagud, Fernando E. Olucha-Bordonau, Mihovil Vukšić, and Patrick R. Hof, "Understanding Emotions: Origins and Roles of the Amygdala," *Biomolecules* 11, no. 6 (2021): article 823, <https://doi.org/10.3390/biom11060823>.

Marie Klug et al., "Persistence of Amygdala Hyperactivity to Subliminal Negative Emotion Processing in the Long-Term Course of Depression," *Molecular Psychiatry* 29 (2024): 1501–1509, <https://doi.org/10.1038/s41380-024-02429-4>.

Kelly E. Wonch, Christina B. de Medeiros, Jennifer A. Barrett, Alexandra Dudin, William A. Cunningham, Geoffrey B. Hall, Meir Steiner, and Alison S. Fleming, "Postpartum Depression and Brain Response to Infants: Differential Amygdala Response and Connectivity," *Social Neuroscience* 11, no. 6 (2016): 600–617, <https://doi.org/10.1080/17470919.2015.1131193>.

¹⁶ Klug et al., "Persistence of Amygdala Hyperactivity."

therapies for depression is reduced amygdala activation.¹⁷ However, in the postpartum maternal brain, increased activation in the amygdala may serve an evolutionary role by making mothers more sensitive to stimuli; in particular, their babies' cries, or environmental or social threats to their babies.¹⁸ The criteria for diagnosis of PPD in the United States, Canada¹⁹ and Europe²⁰ are non-specific in the manuals used by clinicians, and reference or define PPD by defining it as MDD with postpartum onset. This combination of nonspecific diagnoses with postpartum brain activity that is both *specific* to new mothers, and *different* from the general population, leaves much room for further research and improvements in designing and delivering safe, effective and specific therapies for mothers experiencing PPD.

Existing Therapies

Common therapies for postpartum depression are generally derived from or inspired by therapies for other depressive disorders. Talk therapy²¹ and medication²² are common

¹⁷ Henricus G. Ruhé, Jan Booij, Dick J. Veltman, Martin C. Michel, and Aart H. Schene, "Successful Pharmacologic Treatment of Major Depressive Disorder Attenuates Amygdala Activation to Negative Facial Expressions: A Functional Magnetic Resonance Imaging Study," *Journal of Clinical Psychiatry* 73, no. 4 (2012): 451–459, <https://doi.org/10.4088/JCP.10m06584>.

¹⁸ Wonch et al., "Postpartum Depression and Brain Response to Infants."

¹⁹ Wisner, Moses-Kolko, and Sit, "Postpartum Depression."

²⁰ World Health Organization, "International Classification of Diseases 11th Revision," accessed April 29, 2026, <https://icd.who.int>.

²¹ Sona Dimidjian and Sherryl Goodman, "Nonpharmacologic Intervention and Prevention Strategies for Depression During Pregnancy and the Postpartum," *Clinical Obstetrics and Gynecology* 52, no. 3 (2009): 498–515, <https://doi.org/10.1097/GRF.0b013e3181b52da6>.

²² Constance Guille, Rachel Newman, Lisa D. Fryml, Carolyn K. Lifton, and C. Neill Epperson, "Management of Postpartum Depression," *Journal of Midwifery & Women's Health* 58, no. 6 (2013): 643–653, <https://doi.org/10.1111/jmwh.12104>.

approaches, with Cognitive Behavioral Therapy being a common research-supported treatment.²³ Because new mothers are often cautious about taking medicines into their bodies,²⁴ somatic therapies like massage and arts-based therapies have been fruitful avenues for exploring new treatments.²⁵ Unfortunately, it can be difficult to assess which of these therapies are genuinely promising from a data standpoint; as these arts-based therapies have evolved, there has been very little standardization of terms or methods and the term music therapy is applied to very different practices, ranging from passive listening, to sound baths, to group singing.²⁶ Moreover, although the Food and Drug Administration in the United States created a new policy in the early 1990s encouraging companies to include more women in clinical trials for drug development,²⁷ as of 2018 women were still not represented relative to their proportion of the population in trials for the development of new medicinal therapies,²⁸ and postpartum women even less so.²⁹ While researchers have studied these approaches and conducted meta-analyses of their efficacy (as cited on the previous page and discussed in Chapter 2), the lack of consistent application of

²³ Dimidjian and Goodman, “Nonpharmacologic Intervention.”

²⁴ Elizabeth A. Winans, “Antidepressant Use During Lactation.” *Journal of Human Lactation* 17, no. 3 (2001): 256. <https://doi.org/10.1177/089033440101700309>.

²⁵ Yue Zhu et al., “Comparative Effectiveness of Non-Pharmacological Interventions for Postpartum Depression and Anxiety: A Network Meta-Analysis,” *Neuropsychiatric Disease and Treatment* 21 (2025): 2817–2834, <https://doi.org/10.2147/NDT.S549504>.

²⁶ Zhu et al., “Comparative Effectiveness,” 2819.

²⁷ Ruth B. Merkatz, Robert Temple, Solomon Sobel, Karyn Feiden, David A. Kessler, and the Working Group on Women in Clinical Trials, “Women in Clinical Trials of New Drugs: A Change in Food and Drug Administration Policy,” *New England Journal of Medicine* 329, no. 4 (1993): 292–296, <https://doi.org/10.1056/NEJM199307223290429>.

²⁸ Louise Pilote and Valeria Raparelli, “Participation of Women in Clinical Trials: Not Yet Time to Rest on Our Laurels,” *Journal of the American College of Cardiology* 71, no. 18 (2018): 1970–1972, <https://doi.org/10.1016/j.jacc.2018.02.069>.

²⁹ Jeanne S. Sheffield, David Siegel, Mark Mirochnick, R. Phillips Heine, Christine Nguyen, Kimberly L. Bergman, Rada M. Savic, Jill Long, Kelly E. Dooley, and Mirjana Nesin, “Designing Drug Trials: Considerations for Pregnant Women,” *Clinical Infectious Diseases* 59, suppl. 7 (2014): S437–S444, <https://doi.org/10.1093/cid/ciu709>.

terms makes data about music-based treatments hard to assess compared to traditional therapies, which are themselves hard to assess due to a comparative lack of research relative to depressive disorders in the population at large.

Neurologic Music Therapy

A promising path forward, both from the standpoint of data assessment and clinical verification, as well as potential therapeutic effectiveness, lies in the field of Neurologic Music Therapy (NMT). Since the early 1980s, developments in NMT research have shown promising results for neurological and mobility issues associated with conditions like Parkinson's and stroke, as well as mood disorders.³⁰ NMT harnesses parallel processes activated by music in the brain to accomplish non-musical goals in other neurological or physical processes.³¹ For example, the process that causes a person's legs to move in time with a rhythm, known as *rhythmic entrainment*, can be harnessed to help with problems in gait that develop in Parkinson's patients.³² My personal experience with postpartum depression and music creation led me to the idea that NMT would be a promising area of research on which to base potential therapies for

³⁰ Michael H. Thaut and Shannon K. de l'Etoile, "The Effects of Music on Mood State-Dependent Recall," *Journal of Music Therapy* 30, no. 2 (1993): 70–80, <https://doi.org/10.1093/jmt/30.2.70>.

Agnieszka A. Bukowska, Piotr Kręzałek, Ewa Mirek, Piotr Bujas, and Anna Marchewka, "Neurologic Music Therapy Training for Mobility and Stability Rehabilitation with Parkinson's Disease: A Pilot Study," *Frontiers in Human Neuroscience* 9 (2016): article 710, <https://doi.org/10.3389/fnhum.2015.00710>.

Leticia Prieto Álvarez, "Neurologic Music Therapy with a Habilitative Approach for Older Adults with Dementia: A Feasibility Study," *Music Therapy Perspectives* (US) 40, no. 1 (2022): 76–83. <https://doi.org/10.1093/mtp/miab021>.

³¹ Michael H. Thaut and Volker Hoemberg, eds., *Handbook of Neurologic Music Therapy*, 1st ed. (Oxford University Press, 2014).

³² Bukowska et al., "Neurologic Music Therapy Training," article 710.

PPD, using active music creation as the musical process to harness, and with the goal of reducing depressive symptoms. A possible candidate mechanism for the parallel neurological process is the increased connectivity between and among systems and structures in the brain associated with music composition and creation.³³

Music Education, Language/Culture and Society

This dissertation examines the potential of music creation as a tool, and so an examination of factors that may make music creation feel inaccessible or difficult to many people is relevant. Chapter 3 discusses these factors, including the ways in which we discuss creation and creative acts as a society, and common methods and practices in conventional music education. Data about these factors is put into a discourse with autoethnographic vignettes about how my subjective experiences as both a student and a teacher led me to critique both methods and outcomes of conventional music education.

Using Dweck's work on growth mindset³⁴ as a theoretical foundation for analysis, I will discuss and provide supporting literature for my view that both in a school setting and in private or conservatory lessons, conventional music education communicates a fixed mindset about

³³ Jie Lu et al., "The Brain Functional State of Music Creation: An fMRI Study of Composers," *Scientific Reports* 5 (2015): article 12277, <https://doi.org/10.1038/srep12277>.

Rui Ma et al., "Effects of music composition on structural and functional connectivity in the orbitofrontal cortex," *Brain-Apparatus Communication: A Journal of Bacomics* (2024) 3(1), <https://doi.org/10.1080/27706710.2024.2346498>

David M. Bashwiner, Donna K. Bacon, Christopher J. Wertz, Ranee A. Flores, Muhammad O. Chohan, Rex E. Jung, "Resting state functional connectivity underlying musical creativity," *NeuroImage*, (2020) Volume 218, 116940, ISSN 1053-8119, <https://doi.org/10.1016/j.neuroimage.2020.116940>.

³⁴ Dweck, *Mindset*.

musical creation; that is to say, the social and educational environment around music *inaccurately* communicates that the ability to create music is intrinsic to the individual and not an ability that can be developed or changed. I assert that through the fault of no individual factor and certainly through no ill intent on the part of teachers or schools, focusing on “talent,” technique and performance, and the substitution of symbolic representations of music itself for actual music learning, results in many ordinary people feeling alienated from their own natural ownership of music creation as a human activity. Further, I posit that the way we talk about music and musicians as a culture leaves the impression that the ability to make it is magical and inherent, and not the fruit of productive struggle and revision.

Artistic Practice as Research

In the sequence of events from my oldest daughter’s birth to the present, I engaged not only in personal research about the symptoms I was experiencing, and scholarly research in my professional life — into the pedagogy of creativity in education, as well as study of the theory and practice of musical composition — but also musical research, through the generation and iteration of music with the purpose of processing my experiences. This music itself generated knowledge and further inquiry. The combination of these streams of research led me to develop what I believe is a uniquely informed pedagogy for helping other mothers learn to create their own music, based on my own music creation as practice-led research and deepened and structured through my interdisciplinary scholarly research. What I term *intercausality* — a causal feedback loop between my artistic practice, the research required to create it, my scholarly

research, and my experience of the process — led me to situate my work in the evolving discipline of Artistic Practice as Research. I draw on the theories of Kathleen Coessens, Darla Crispin, Sir Christopher Frayling, Henk Borgdorff, Sophie Stévance and Serge Lacasse,³⁵ and other scholars to explain this work.

Concurrently, the development of my own compositional practice significantly increased its functional impact to me as a tool for processing and regulating emotional experience. My research and practice as an educator has allowed me to design methods to effectively pass this tool along to others. It has also helped me identify and explain the ways in which I assert conventional music education can actually interfere with these beneficial emotional effects of music in the student musician.

Autoethnography is a research method in which the researcher attempts to use and analyze their personal experience in order to advance understanding of a phenomenon larger than themselves.³⁶ Beginning in the 1980's, researchers in the social sciences began questioning the idea that research was neutral or impersonal, pointing out the many ways in which a researcher's or institution's perspective and priorities could influence subject choice, depth of research,

³⁵ Selected works include: Darla Crispin, "Artistic Research and Music Scholarship: Musings and Models from a Continental European Perspective," in *Artistic Practice as Research in Music: Theory, Criticism, Practice*, ed. Mine Doğan-Dack (Ashgate, 2015), 53–72.

Christopher Frayling, *Research in Art and Design, Royal College of Art Research Papers 1*, no. 1 (1993/94) (Royal College of Art, 1993).

Henk Borgdorff, *The Debate on Research in the Arts, Sensuous Knowledge 2* (Bergen National Academy of the Arts, 2006).

Sophie Stévance and Serge Lacasse, *Research-Creation in Music and the Arts: Towards a Collaborative Interdiscipline*, 1st ed. (Routledge, 2018).

³⁶ Carolyn Ellis, Tony E. Adams, and Arthur P. Bochner, "Autoethnography: An Overview," *Historical Social Research / Historische Sozialforschung* 36, no. 4 (138) (2011): 273–290, <http://www.jstor.org/stable/23032294>.

analysis and outcomes. The evolving discourse on APAR also examines and foregrounds the relationships between subjectivity and objectivity in art, research culture, and art that is research.

Pedagogy Development

My pedagogy developed over the course of my teaching career. My own study of Educational Psychology as an early career teacher resonated with my experiences as a young student, and illuminated and gave me vocabulary to describe the ways in which I found my own early musical education lacking. Adele Faber and Elaine Mazlish's work,³⁷ itself drawing on Carol Dweck's theory of growth mindset, was foundational to my approach to language and pedagogy. Mihaly Csikszentmihalyi's theories of creativity and flow³⁸ also deeply informed my approach. The work of educator and songwriter Pat Pattison provided a structure that deeply influenced both my own compositional practice as well as the way I teach.

Drawing from these pedagogical foundations to support my methodology, I designed a study to investigate feasibility and potential directions for future empirical research based on the potential of music creation to alleviate symptoms of postpartum depression in new mothers. As part of this work I explicitly researched Neurologic Music Therapy, and blended its principles with the pedagogies of both music instruction and creativity in my design.

Study Design and Methods

³⁷ Adele Faber and Elaine Mazlish, *How to Talk So Kids Will Listen and Listen So Kids Will Talk*, 4th ed. (Piccadilly Press, 2017).

³⁸ Mihaly Csikszentmihalyi, *Flow: The Psychology of Optimal Experience* (Harper & Row, 1990).

I recruited a first-time mother with PPD, and worked with her via videoconferencing for six, thirty-minute sessions to teach her to create her own music. I guided her through the music creation process using the songwriting method I developed based on my research, described in detail in Chapter 6. She wrote a song, and we recorded her song remotely. Before and after the intervention, she completed two tasks to generate quantitative data correlated with her participation in the study: the Edinburgh Postnatal Depression Survey,³⁹ a patient-reported outcome measure used to screen for postpartum depression, and the FACES task⁴⁰, a task rating the emotional valence of faces normed for use in screening for depression. A qualitative exit interview included the participant's own voice and observations in this research. The participant demonstrated improvement in both quantitative measures, and self-reported improvement in her qualitative interview. I hope the greater field of research into therapies for postpartum depression will benefit from these findings when designing future studies.

The subsequent chapters of this dissertation will explain in further detail the widespread problem of postpartum depression and its impacts to mothers, children and families, as well as the neurology of postpartum depression and how it differs from other depressive disorders (Chapter 1), and current treatments (Chapter 2). I will explain in detail challenges with both current and historical music pedagogy and how they appear to alienate many people from the process of music creation (Chapter 3). I will explain how a retrospective autoethnographic

³⁹ John Cox, JM Holden, and R. Sagovsky. "Detection of Postnatal Depression. Development of the 10-Item Edinburgh Postnatal Depression Scale." *British Journal of Psychiatry* 150, no. 6 (1987): 782–86. <https://doi.org/10.1192/bjp.150.6.782>.

⁴⁰ Natalie C. Ebner, Michaela Riediger, and Ulman Lindenberger, "FACES—A Database of Facial Expressions in Young, Middle-Aged, and Older Women and Men: Development and Validation," *Behavior Research Methods* 42, no. 1 (2010): 351–362, <https://doi.org/10.3758/BRM.42.1.351>.

approach to my own experiences as a young musician and student of music as well as the ways in which creating music helped me process and alleviate my symptoms of postpartum depression led me to conceive of that compositional process as Artistic Practice as Research (Chapter 4). I will discuss and analyze my own experiences with postpartum depression and music creation (Chapter 5). Creative pedagogy that incorporates growth mindset offers many valuable lessons to help remediate this alienation, and this dissertation will discuss these lessons, as well as how I incorporated them into the design of my case study (Chapter 6). Finally, I will present my case study, its results, and my current piece “Carrying,” created using my former work, field recordings and journal entries from my postnatal period as input into my Artistic Practice as Research. My composition is an electroacoustic exploration that uses my past experience and symbolic sounds connected to my family as musical material, communicating love and support to my past self who experienced postpartum depression, and framing the value of the experience to myself by creating beauty from it. The process of creating this composition allowed me to process, generate knowledge about, and communicate my experiences with PPD in a nonlinear and embodied way. As a symbolic creation, for me, it connects my periods of postpartum depression to the present day, and to the beauty and subjective feelings of success and joy that I have experienced since that time. As a product and practice of Artistic Research, it aims to process and communicate artistically, and to center the maternal experience in research about PPD.

Chapter 1: More than Blue: The Significant Problem of Postpartum Depression

Chapter Introduction

This chapter will provide the reader with background information about postpartum depression (PPD). Although it is a pervasive and worldwide problem, there are complicating factors that make understanding it and treating it comparatively difficult. Social ideas and idealized expectations of a normal maternal experience often clash with mothers' self-concept relative to those ideas, making it less likely for women to know when they may need treatment. When they do, the lack of clarity and specificity in the diagnostic manuals used around the world seems to make it harder for clinicians to diagnose the condition. Further, the neurology of PPD is different than the neurology of other depressive disorders. New motherhood is a time of drastic changes to the brain, unlike any other in the human life cycle. These factors combine to create a uniquely challenging landscape of diagnosis and treatment for mothers and clinicians.

Idealized Expectations vs. Realities

Although new motherhood is often idealized in the public imagination,⁴¹ it is unfortunately quite common for new mothers to experience troubles with mood, energy, functioning and self-concept during the perinatal⁴² and postpartum periods. In fact, it is so

⁴¹ Ciera E. Kirkpatrick and Sungkyoung Lee, "Idealized Motherhood on Social Media: Effects of Mothers' Social Comparison Orientation and Self-Esteem on Motherhood Social Comparisons," *Journal of Broadcasting & Electronic Media* 68, no. 2 (2024): 284–304, <https://doi.org/10.1080/08838151.2024.2324152>.

⁴² Defined together as the time during pregnancy and up to one year postpartum. Jenifer O. Fahey and Edmond Shenassa, "Understanding and Meeting the Needs of Women in the Postpartum Period: The Perinatal Maternal Health Promotion Model," *Journal of Midwifery & Women's Health* 58, no. 6 (2013): 613–621, <https://doi.org/10.1111/jmwh.12139>.

common⁴³ that it can be difficult to tell the difference between a more mildly presenting postpartum affective disorder and a normative experience of early motherhood. Researcher Cheryl Beck evocatively refers to postpartum depression (PPD) as “a thief that steals motherhood.”⁴⁴ It is an apt metaphor. This thief steals joy, time, productivity and connection from mothers in all cultures, of all races and ethnic backgrounds, and at all levels of wealth.⁴⁵ In plain language, PPD is a common and serious complication affecting not only mothers, but also their children, families and communities.⁴⁶ In 2018, the Centers for Disease Control in the United States published their findings on the prevalence of PPD across thirty-one individual states, finding a range from 10 to 20% among them⁴⁷. Incidence varies throughout the world, but generally tends to fall within this range — in Norway, incidence was approximately 11%; Spain around 18% and Turkey between 15 and 18%. ⁴⁸ Any way it is measured, PPD affects millions.

In 2022, researchers at the University of Washington conducted a study of both general maternal mortality and maternal suicide.⁴⁹ Their grim findings illustrated the severity of the issue: according to their research, 20% of worldwide maternal deaths in the perinatal period are a result of suicide. In the introduction to their study, the researchers write: “It can be challenging to

⁴³ Kendall-Tackett, *Depression in New Mothers*, 7.

⁴⁴ Cheryl Tatano Beck, “Postpartum Depression: It Isn’t Just the Blues,” *American Journal of Nursing* 106, no. 5 (2006): 41, <https://doi.org/10.1097/00000446-200605000-00020>.

⁴⁵ Kendall-Tackett, *Depression in New Mothers*, 4.

⁴⁶ Kendall-Tackett, *Depression in New Mothers*, 13.

⁴⁷ Brenda L. Bauman et al., “Vital Signs: Postpartum Depressive Symptoms and Provider Discussions About Perinatal Depression — United States, 2018,” *Morbidity and Mortality Weekly Report* 69, no. 19 (2020): 575–581, <https://doi.org/10.15585/mmwr.mm6919a2>.

⁴⁸ Kendall-Tackett, *Depression in New Mothers*, 7.

⁴⁹ Kathleen Chin, Amelia Wendt, Ian M. Bennett, and Amritha Bhat, “Suicide and Maternal Mortality,” *Current Psychiatry Reports* 24, no. 4 (2022): 239, <https://doi.org/10.1007/s11920-022-01334-3>.

imagine that someone would take their own life during a period that is generally viewed as one of the happiest events in life.”⁵⁰ It is somewhat challenging for this writer to imagine that researchers in the field of maternal mortality would be surprised that the perinatal and postpartum period are a time of such risk to the mental health of mothers. Women are more likely to be hospitalized for psychiatric reasons during the first four weeks after giving birth than at any other time in their lives. An estimated 12.5% of psychiatric hospitalizations of women occur during this time.⁵¹

Researchers and clinicians have devised three main categories of postpartum affective disorders. From the mildest to most severe, they are: the so-called ‘baby blues,’ postpartum depression, and postpartum psychosis.⁵² The ‘baby blues’ can overlap with what is considered a typical postpartum experience and usually resolves on its own without needing intervention. Postpartum psychosis, the most severe state, requires immediate intervention, and can involve delusions, hallucinations, and rapidly cycling extreme moods. Falling somewhere in the middle of these two states is postpartum depression (PPD). As of this writing, PPD does not have a separate classification in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, known as the DSM-5, which is the standard guide for mental health providers in the United States and Canada. In the DSM-5, PPD is identified, but as a subcategory of major depressive disorder: specifically, a depressive episode with a postpartum onset occurring up to 4

⁵⁰ Chin et al., “Suicide and Maternal Mortality,” 239.

⁵¹ Registered Nurses’ Association of Ontario, *Interventions for Postpartum Depression* (Registered Nurses’ Association of Ontario, 2011), 15.

⁵² Lauren M. Osborne, “Recognizing and Managing Postpartum Psychosis: A Clinical Guide for Obstetric Providers,” *Obstetrics and Gynecology Clinics of North America* 45, no. 3 (2018): 455–468, <https://doi.org/10.1016/j.ogc.2018.04.005>.

weeks after birth.⁵³ The Ontario Nurses association expands that definition to include the first year after childbirth.⁵⁴

The DSM-5 is the manual most used in the United States, Canada, Australia, and New Zealand. In Europe, the standard diagnostic manual is the International Classification of Diseases (ICD).⁵⁵ Although the ICD 11, the most current version, includes three entries for postpartum mental health issues, they are all essentially described by referring to other conditions, and then saying the diagnosis applies if that condition happens to occur during the postpartum period. For example, according to the ICD 11, there is nothing specific or unique about PPD compared to major depressive disorder (MDD); PPD is just defined as MDD occurring during the postpartum period. Clinicians using the manual are instructed to assign the other diagnosis that applies, for example, single or recurrent depressive episodes, or obsessive compulsive disorder. Of particular interest is the notion of “boundary with normality.” The ICD describes:

Boundary with Normality (Threshold):

This [PPD] diagnosis should not be used to describe mild and transient depressive symptoms that do not meet the diagnostic requirements for a Depressive Episode, which may occur soon after delivery (so-called ‘postpartum blues’ or ‘baby blues’). Postpartum depression may be mistaken for ‘baby blues’ at first, but the signs and symptoms are more intense, last longer, and interfere with functioning, including the ability to care for the baby. If the diagnostic requirements are met for a Depressive Episode, a diagnosis of Single Episode Depressive Disorder or Recurrent Depressive Disorder should also be assigned. Worries and fears about the baby during pregnancy and after childbirth and some degree of intrusive thoughts about possible harms are common and should not be diagnosed as Mental or Behavioural Disorders Associated with Pregnancy, Childbirth or

⁵³ Wisner, Moses-Kolko, and Sit, “Postpartum Depression,” 37-40.

⁵⁴ Registered Nurses’ Association of Ontario, *Interventions for Postpartum Depression*, 15.

⁵⁵ World Health Organization, *International Classification of Diseases*, 11th Revision.

the Puerperium unless they are persistent, associated with substantial distress, and interfere with functioning, including the ability to care for the baby.⁵⁶

So, in the diagnostic manuals that clinicians use worldwide, a lack of both clarity and specificity persists regarding postpartum mental health. This contributes to challenges in identifying and assessing effective treatments for PPD.

Even though there is no separate diagnosis of PPD in the DSM-5, and the ICD simply adds a postpartum onset criteria to pre-existing diagnoses, clinicians do have screening tools that are specifically intended for use with postpartum women; the most common are structured surveys in which women self-rate their own symptoms. This type of survey is called a Patient Reported Outcome Measure (PROM). A 2022 systematic review of PROMS for PPD identified the Edinburgh Postnatal Depression Scale, a 10-item written patient-reported survey developed in the late 1980s in the United Kingdom,⁵⁷ as the tool with the most *validity* (the extent to which something measures what it intends to measure) and *reliability* (how repeatable the results are across different instances).⁵⁸

The EPDS asks mothers to compare their experience to a series of short statements, such as “Things have been getting to me: Yes, most of the time I haven’t been able to cope at all ____ (3) Yes, sometimes I haven’t been coping as well as usual ____ (2) No, most of the time I have

⁵⁶ World Health Organization, “6E20 Mental or Behavioural Disorders Associated with Pregnancy, Childbirth or the Puerperium, without Psychotic Symptoms,” *ICD-11 for Mortality and Morbidity Statistics*, 2026-01 release, accessed March 13, 2026, <https://icd.who.int/browse/2026-01/mms/en#1124422593>.

⁵⁷ John Cox, Jeni Holden, and R. Sagovsky. “Detection of Postnatal Depression. Development of the 10-Item Edinburgh Postnatal Depression Scale.” *British Journal of Psychiatry* 150, no. 6 (1987): 782–86. <https://doi.org/10.1192/bjp.150.6.782>.

⁵⁸ Pervez Sultan et al., “Assessment of Patient-Reported Outcome Measures for Maternal Postpartum Depression,” *JAMA Network Open* 5, no. 6 (2022): e2214885, <https://doi.org/10.1001/jamanetworkopen.2022.14885>.

coped quite well ____ (1) No, I have been coping as well as ever.”⁵⁹ Responses are scored, with a score of 12 or 13 indicating possible PPD and prompting follow-up.

Since the EPDS is specially designed to be used during the postpartum period, it does not include questions about sleep, appetite changes, or weight loss or gain, as categorical changes in these areas are considered normal in the postpartum period. It is important to note that these last somatic items are considered indicators of depression in other screening tools like the Hamilton Rating Scale for Depression-HAM-D, and the Beck Depression Inventory-BDI.⁶⁰ This blurred boundary between a normative experience and a disordered one can make it even more difficult for mothers to determine whether or not to seek help, and for clinicians to determine how serious a mother’s condition is.

Researchers have used the EPDS across the world and found that depressive symptoms and experiences are very common among postpartum women everywhere. In 2018, researchers in California conducted a systematic review and meta-analysis of 291 studies from 56 countries using the EPDS, with sample populations of more than 20 women who were less than one year postpartum, totaling almost 300,000 women.⁶¹ These researchers found a 17.7% global incidence of PPD on average, or just under 1 in 5 mothers. They also found that rates of PPD varied widely by country. In nations with higher rates of income inequality and maternal and infant mortality, as well as women working more than 40 hours per week, the researchers found an association with a statistically significant increase in rates of PPD.⁶²

⁵⁹ Cox, Holden, and Sagovsky, “Detection of Postnatal Depression,” 786.

⁶⁰ Hahn-Holbrook et al, “Economic and Health Predictors,” 4.

⁶¹ Hahn-Holbrook et al, “Economic and Health Predictors,” 5.

⁶² Hahn-Holbrook et al, “Economic and Health Predictors,” 5.

Because the meta-analysis above only included studies that used the EPDS to measure data, it did not include information about PPD in countries or places that lack the basic means required to administer the EPDS, like clinics and roads. Nevertheless, according to the authors, “The percentages of infants born outside of marriage, living in single parent homes or in urbanized areas did not predict crossnational [sic] PPD prevalence.”⁶³ The data discussed thus far show postpartum depression is everywhere, in wealthy countries and poor ones. This reality highlights the importance of identifying treatments that are not expensive, that can include or do not require childcare for working mothers, and that are accessible to people without regular transportation or in remote areas.

Most societies have deeply engraved cultural ideas and expectations of what motherhood and mothers should be. As demonstrated in a 2009 meta-analysis of women’s experiences with PPD, the difference between these embedded ideas and the many challenging realities of motherhood appears to contribute significantly to women’s sense of not measuring up in terms of maternal experiences, performance, and even their worth as mothers.⁶⁴ As shown below, a review of this research on women’s postpartum self-concept reveals that mothers often internalize the fault for this gap between expectation and experience; data suggest this self-blame contributes to postpartum depression.

The meta-analysis used nine studies conducted from between 1999 and 2005, in seven European countries, Japan, Hong Kong, India, Uganda, and the United States. Researchers assigned coded terms to the mother’s described experiences, for example “fear of being judged,”

⁶³ Hahn-Holbrook et al, “Economic and Health Predictors,” 5.

⁶⁴ Carmen Knudson-Martin and Randi Silverstein, “Suffering in Silence: A Qualitative Meta-Data-Analysis of Postpartum Depression,” *Journal of Marital and Family Therapy* 35, no. 2 (2009): 145–158, <https://doi.org/10.1111/j.1752-0606.2009.00112.x>

and then categorized these into a taxonomy of broader categories like ‘expectations.’⁶⁵ They found that a progressive worsening, social isolation and a perception of lacking competence as a mother were common features.⁶⁶ According to their analysis, it was not the feelings themselves that caused depression, but the “inability to express these emotions in a validating context and the resultant experience of isolation from others that supported and maintained the depression.”⁶⁷

A 2005 Swedish analysis of the experiences of 22 women who scored above 10 on the EPDS similarly reported new mothers “were struggling with life related to the self, the child, and the partner.” Mothers described feeling a “loss of who they are,” as well as being overwhelmed by child-related tasks, which could indirectly indicate a lack of social support. They also reported feeling like “bad mothers,” and were reticent to express their feelings about motherhood. Most felt this was their personal failing.⁶⁸

It is important to understand that although factors like income, location, age, and ethnicity can play a role, PPD can affect any mother, and although research suggests women with a history of PPD may be more likely to experience it with subsequent births, mothers with no prior history are at risk as well.⁶⁹ In 2018, finding a gap in analysis relative to this risk, researchers in Singapore undertook a systematic review and meta-analysis of 58 studies related

⁶⁵ Knudson-Martin and Silverstein, “Suffering in Silence,” 150.

⁶⁶ Knudson-Martin and Silverstein, “Suffering in Silence,” 150.

⁶⁷ Knudson-Martin and Silverstein, “Suffering in Silence,” 150.

⁶⁸ Maigun Edhborg, Malin Friberg, Wendela Lundh, and Ann-Marie Widström, “‘Struggling with Life’: Narratives from Women with Signs of Postpartum Depression,” *Scandinavian Journal of Public Health* 33, no. 4 (2005): 261, <https://doi.org/10.1080/14034940510005725>.

⁶⁹ Banti et al., “From the Third Month of Pregnancy,” 349.

to postpartum depression (PPD) in healthy mothers.⁷⁰ Their findings confirmed that it is a serious and prevalent issue in mothers with no history of mental illness. The incidence of PPD was similar regardless of the diagnostic tool used, but self-reported assessments tended to show higher rates than clinical assessments. Incidence was highest in the Middle East, at 26%, and lowest in Europe, at 8%, but worldwide averages ranged from 12-20%.⁷¹

Of particular note were two findings by the researchers. First, healthy mothers with no history of depression had *no less risk* of experiencing postpartum depression; their overall prevalence was 17% relative to the average of 12% in the meta-analysis. Second, rates of depression in mothers were increasingly prevalent *after* the six-month mark.⁷² This is important because the diagnostic criteria used to identify PPD often delimit the time period to various ranges, for example, having an onset at four weeks postpartum, or within the first year postpartum. However, a 2015 study from Australia found higher rates of depression in mothers at four years postpartum than at three, six, twelve or eighteen months, with correlations including young maternal age, domestic partner violence, and lower income.⁷³

Many factors compound both the severity of impact and difficulty of treatment for this condition, including myths about PPD itself. In her comprehensive book “Depression in New Mothers: Causes, Consequences, and Treatment Alternatives,” Kathleen Kendall-Tackett describes and debunks a number of widespread myths about PPD that contribute to mothers not

⁷⁰ Shefaly Shorey and Hee Lam Chee, “Prevalence and Incidence of Postpartum Depression among Healthy Mothers: A Systematic Review and Meta-Analysis.” *Journal of Psychiatric Research* 104 (September 2018): 241. <https://doi.org/10.1016/j.jpsychires.2018.08.001>.

⁷¹ Shorey and Chee, “Prevalence and Incidence of Postpartum Depression,” 239.

⁷² Shorey and Chee, “Prevalence and Incidence of Postpartum Depression,” 242.

⁷³ Kendall-Tackett, *Depression in New Mothers*, 7.

seeking treatment. Among them: that PPD is not serious, that it is exclusive to certain demographics of women, or that it means the mother does not love her baby or will not be a good mother. These myths can cause deep shame in women experiencing PPD, and they play a role in their reluctance to admit to their symptoms.⁷⁴

Kendall-Tackett posits that the absence of a dedicated category in the DSM-5 likely contributes to under-diagnosis. Given that the ICD also ‘punts’ postpartum diagnoses, this seems to be a more than reasonable supposition. To summarize, the diagnostic manuals referenced by clinicians worldwide lack specificity and clarity regarding postpartum mental health. The normative experience of early motherhood includes mood symptoms that would look like depression under any other circumstances. Trying to live up to popular idealized conceptions of motherhood may force struggling women further under the radar. As we will now see, neuroimaging research would suggest that specific changes in the early maternal brain may contribute to difficulties in designing and assessing treatment as well.

Depression and the Brain

To create effective treatments for conditions, it is essential to understand what may be happening to cause those conditions. When those conditions involve mood or mental function (such as PPD), neuroimaging studies like functional magnetic resonance imaging (fMRI) can provide an understanding of the brain activity correlated with particular symptoms. A 2014 meta-

⁷⁴ Kendall-Tackett, *Depression in New Mothers*, 4.

analysis of such imaging studies related to major depressive disorder (MDD) revealed multiple structural and functional changes in the brain common to people suffering from MDD.⁷⁵

This meta-analysis revealed patterns in data showing that a depressed brain both looks and works quite differently from a healthy brain. Reductions in grey matter were observed across multiple areas of the brain. Grey matter comprises the surface of the brain, and contains many *neuronal bodies*, the nuclei of brain cells that are necessary for basic functioning and information processing.⁷⁶ Specific regions showing a reduction in grey matter volume included the anterior cingulate cortex (ACC), dorsolateral prefrontal cortex (DLPFC) and orbitofrontal cortex (OFC).⁷⁷ Each of these cortices is correlated with several functional processes. The ACC is associated with decision-making and emotional regulation, including suppressing responses to the *amygdala* when faced with negative emotional information.⁷⁸ The amygdala is a key part of the *limbic system*, the brain-body system responsible for threat assessment and emotion detection. In this context, the amygdala can be thought of as a ‘fight or flight’ center in the brain.⁷⁹ The DLPFC is also associated with decision-making, and *executive function* — the suite

⁷⁵ Lauren Atkinson, Anjali Sankar, Tracey M. Adams, and Cynthia H. Y. Fu, “Recent Advances in Neuroimaging of Mood Disorders: Structural and Functional Neural Correlates of Depression, Changes with Therapy, and Potential for Clinical Biomarkers,” *Current Treatment Options in Psychiatry* 1, no. 3 (2014): 278–293, <https://doi.org/10.1007/s40501-014-0022-5>.

⁷⁶ Cleveland Clinic, “Gray Matter,” last updated February 22, 2026, <https://my.clevelandclinic.org/health/body/24831-grey-matter>.

⁷⁷ Atkinson et al, “Recent Advances in Neuroimaging of Mood Disorders,” 278–293.

⁷⁸ Kim, Strathearn, and Swain, “The Maternal Brain,” 115.

⁷⁹ Hariri et al., “Amygdala Response to Emotional Stimuli,” 317.

of ‘driver’s seat’ choices commonly thought of as self-control.⁸⁰ The OFC, again, is associated with emotional regulation, as well as reward processing.

fMRI studies included in the 2014 meta-analysis showed not only a reduction in grey matter in these key areas, but also dysregulated connections between these decision-making and emotion-regulating areas and the limbic system. Researchers found notably decreased connectivity between the amygdala and the prefrontal cortex in depressed patients,⁸¹ suggesting a connection between this decreased connectivity and both decreased emotional regulation and increased sensitivity to negative stimuli. Essentially, a brain with MDD is not able to communicate well with itself, and the parts of the brain and channels of communication associated with systems of emotional regulation and decision-making are physically diminished.

Further, in patients with MDD, the amygdala appears more reactive to negative stimuli.⁸² One way to think of it is that the depressed brain seems biased toward negative emotional information. Building on earlier research in this area, in 2024 researchers undertook to examine this perceived brain bias.⁸³ They compared the responses of healthy patients to depressed patients, seeking to determine whether amygdala hyperactivation was a “state” or a “trait” — meaning, whether it was a feature of brains that are prone to depression, or, something that happens to the brain of someone who is experiencing depression. Their findings suggested that it is a trait, as hyperactivation of the amygdala to sad stimuli persisted after two years, even in

⁸⁰ Michael Koenigs and Jordan Grafman, “The Functional Neuroanatomy of Depression: Distinct Roles for Ventromedial and Dorsolateral Prefrontal Cortex,” *Behavioural Brain Research* 201, no. 2 (2009): 242, <https://doi.org/10.1016/j.bbr.2009.03.004>.

⁸¹ Atkinson et al., “Recent Advances in Neuroimaging of Mood Disorders,” 280.

⁸² Danilo Arnone, “Functional MRI Findings, Pharmacological Treatment in Major Depression and Clinical Response,” *Progress in Neuro-Psychopharmacology & Biological Psychiatry* 91 (April 2019): 34. <https://doi.org/10.1016/j.pnpbp.2018.08.004>.

⁸³ Klug et al. “Persistence of amygdala hyperactivity,” 1501-9.

patients in remission from MDD.⁸⁴ Although a 2018 review of longitudinal studies conducted by researchers in the UK found that the ‘state or trait’ status was not clear, their findings agreed that “hyperactivity in the amygdala and the ventral components of the anterior cingulate cortex are the most replicated findings of functional MRI studies in major depression.”⁸⁵

These data are important. Taken together, they describe a picture of structural and functional differences in the depressed brain that provides the opportunity for researchers to attempt to predict how particular patients will respond to existing treatments, based on how those treatments are known to affect brain function. Researchers can also use this information to devise new treatments. In patients with MDD, both pharmacological and psychological therapies lead to changes in brain function, including decreased amygdala activation.⁸⁶

Differences in the Postpartum Brain

The lack of a standalone diagnosis for PDD in the DSM-5 becomes even more pressing when research suggests that different processes are occurring in the brain of a woman with postpartum depression. Although the outwardly measurable symptoms may be the same as, or similar to MDD, the underlying causes and neural correlates may be different enough to have implications for the development of treatments.

⁸⁴ Klug et al. “Persistence of amygdala hyperactivity,” 1507.

⁸⁵ Arnone. “Functional MRI Findings,” 34.

⁸⁶ Atkinson et al., “Recent Advances in Neuroimaging of Mood Disorders,” 285-6.

The first thing to understand is that bearing a child triggers significant *neuroplasticity*, or brain change,⁸⁷ regardless of whether or not the mother experiences PPD. This time is one of a few distinct stages in a human life in which there is ‘supposed to be’ a period of rapid and significant change to the brain. These structural and functional changes occur, facilitated by changes in hormonal and neurotransmitter activity. These neurological changes in turn are thought to correlate with the behavioral changes needed to parent an infant, including changes to the sleep-wake cycle, changes to attention and executive function, and responses to particular stimuli.⁸⁸

In both animal new mothers and human new mothers who are not suffering from depression, responding to their infants sets up a “model motivational system using dopamine and oxytocin rich pathways.”⁸⁹ The amygdala, our ‘fight or flight’ structure from earlier, is thought to be a beneficial part of this pathway. The cries and smiles of a mother rat’s own infant activate the amygdala, and this is associated with positive responses to the infant. Conversely, in childless rats, amygdala activation was associated with reduced caregiving behaviors.⁹⁰ This is important when we recall that decreased amygdala activation is regarded as correlating with a reduction in depressive symptoms in treatments for MDD; that is, a reduction of amygdala activation in the depressed patient is seen as a marker for successful treatment.

⁸⁷ Carola Beltratti, Antonio Bertolotto, Paola Valentino, Federica Frezet, and Luca Marozio, “Post-Partum sNFL Increase Suggests Pregnancy-Induced Neuroplasticity,” *European Journal of Obstetrics & Gynecology and Reproductive Biology* 313 (2025): article 114374, conference abstract, <https://doi.org/10.1016/j.ejogrb.2025.114374>.

⁸⁸ Kim, Strathearn, and Swain, “The Maternal Brain,” 113-120.

⁸⁹ Kim, Strathearn, and Swain, “The Maternal Brain,” 114.

⁹⁰ Nim Tottenham, “Human Amygdala Development in the Absence of Species-Expected Caregiving,” *Developmental Psychobiology* 54, no. 6 (2012): 599, <https://doi.org/10.1002/dev.20531>.

Neuroimaging studies in human mothers seem to corroborate this different role for the amygdala. In both their 2007 pilot study and 2011 expansion, a team of researchers analyzed the difference in neural activation between healthy mothers and mothers with PPD asked to complete a task distinguishing emotionally charged words from non-words while undergoing fMRI.⁹¹ In both studies, the researchers measured a decrease in right amygdala activation for the mothers with PPD when they saw threatening words.⁹² Noting that this result ran counter to studies showing increased amygdala activation with threatening or negative stimuli in patients with MDD, the researchers posited that an increased sensitivity to threat might have an evolutionary advantage for the mother of a newborn.⁹³ In this study and others, a pattern emerges of *hypoactivation*, or under-activation, rather than *hyperactivation*, or over-activation. To state it simply, one of the things that may be going wrong in the brain of a mom with PPD is that the amygdala is not activating enough.

A meta-analysis of imaging studies related to PPD showed consistently similar trends related to amygdala activation.⁹⁴ The meta-analysis discusses the results of several fMRI studies, including one in which the responses of mothers with PPD and healthy mothers to negative adult faces were compared, one in which infant-related hostility was assessed, and neural activity for women with PPD and healthy women while experiencing positive emotions was assessed. In

⁹¹ Marni E. Silverman, Heather Loudon, Miriam Safier, Xenia Protopopescu, Gerald Leiter, Xun Liu, et al., “Neural Dysfunction in Postpartum Depression: An fMRI Pilot Study,” *CNS Spectrums* 12, no. 11 (2007): 853–862, <https://doi.org/10.1017/S1092852900015595>.

⁹² Silverman et al, “Neural Dysfunction,” 858.

⁹³ Silverman et al, “Neural Dysfunction,” 861.

⁹⁴ Chang Duan, Jennifer Cosgrove, and Kristina M. Deligiannidis, “Understanding Peripartum Depression through Neuroimaging: A Review of Structural and Functional Connectivity and Molecular Imaging Research,” *Current Psychiatry Reports* 19, no. 10 (2017): article 70, <https://doi.org/10.1007/s11920-017-0824-4>.

each study, hypoactivation, particularly in the amygdala, characterized the responses of the mothers with PPD relative to the healthy mothers.

In healthy human mothers, the medial and lateral prefrontal cortex and the ACC consistently activate when stimulated by the sound of an infant crying or video of an infant in distress, and the activation is greater for a mother's own child.⁹⁵ In their article "The Maternal Brain and Its Plasticity in Humans," researchers Kim, Strathearn and Swain offer the perspective that this increased activation may involve "preoccupations that may be part of healthy maternal responses to their infants that draw them close in order to meet the infant's physical and psychological needs,"⁹⁶ suggesting that "checking and worrying" brain networks may naturally overlap with the brain systems that activate in patients with obsessive anxiety. They continue to say that "plasticity in anxiety circuits may be part of a healthy range of threat detection and harm avoidance, yet also perhaps an opportunity for problems to occur."⁹⁷

Structurally, the postpartum period is marked by both volume increases and decreases in grey matter, in particular areas. Increases are reported in the prefrontal cortex, and volume reductions are reported in the ACC and posterior midline and bilateral prefrontal cortices. These reductions persisted up to two years postpartum, and the areas in which they occurred measured activity during tests of parental attachment.⁹⁸ These volume reductions are in the same locations that are associated with MDD, and so, much as it is sometimes difficult to tell the difference between a normative postpartum mood experience and depression, it may be that these structural

⁹⁵ Wonch et al., "Postpartum Depression and Brain Response to Infants," 609.

⁹⁶ Kim, Strathearn, and Swain, "The Maternal Brain," 114.

⁹⁷ Kim, Strathearn, and Swain, "The Maternal Brain," 114.

⁹⁸ Duan, Cosgrove, and Deligiannidis, "Understanding Peripartum Depression through Neuroimaging," article 70.

changes may mask or obscure the issues influencing PPD symptoms and the brain relative to MDD symptoms and the brain.

Alternatively, in mothers suffering from PPD, these activations and circuits are suppressed. In 2019, German researchers undertook another meta-analysis of imaging studies to identify similarities and differences between and among four different categories of hormonally related depression in women: depression at the onset of menstruation, premenstrual dysphoric disorder (PMDD), postpartum depression, and perimenopausal depression.⁹⁹ They found interesting differences in neural activation even between these hormonally correlated depressive disorders in women that are important to consider when assessing and designing treatments for each of these disorders. For example, “amygdalar reactivity seems to be deactivated in pubertal depression and PPD,” whereas in PMDD, “results are highly inconsistent throughout the menstrual cycle.”¹⁰⁰ The same processes do not seem to be occurring in the brain even among these disorders with what would seem to the casual observer to have similar causes and symptoms.

I am not a clinician, but it would seem to me that there may be a crucial mismatch between the ways in which we measure both postpartum depression and the success of treatments for it, and what is actually occurring in the postpartum brain. Given that research suggests lessened activity in certain neural circuits and structures, particularly the amygdala, correlates with the symptoms of mothers experiencing PPD, it would follow that pursuing treatments that measure success by *reducing* activation in the amygdala (for example,

⁹⁹ Susanne Stickel, Lisa Wagels, Olga Wudarczyk, Sara Jaffee, Ute Habel, Frank Schneider, and Natalia Chechko, “Neural Correlates of Depression in Women across the Reproductive Lifespan: An fMRI Review,” *Journal of Affective Disorders* 246 (2019): 556–570, <https://doi.org/10.1016/j.jad.2018.12.133>.

¹⁰⁰ Stickel et al., “Neural Correlates of Depression in Women,” 566.

antidepressants such as SSRIs¹⁰¹) may not be the appropriate course of action. While hyperactivation of the amygdala is correlated with major depressive disorder, it may not be an appropriate metric here, as amygdala activation would seem to be part and parcel of changes to the maternal brain that are adapted for infant survival. A meta-analysis of all fMRI studies to date in 2022 would support this view, finding that “The results further support the dissociation of amygdala engagement in respect to positive and negative emotional stimuli in PPD.”¹⁰² To phrase it more simply, we treat and measure other depressive disorders based on too much amygdala *activity*, but postpartum depression may be correlated with a problem in amygdala *connectivity*.

A current Google Scholar search for combinations of the terms “amygdala, postpartum depression, perinatal depression, antidepressant, SSRI”¹⁰³ returns no entries that I would consider relevant to the resolution of this discrepancy in the top 30 search results. While that is not a robust meta-analysis, it suggests to me that if studies are being done to determine differences in neurologically measurable treatment outcomes, they are not as widely publicized or replicated. Gathering usable data on treatments that increase activation and connectivity in and among specific brain circuits and structures would seem to be a more productive path than

¹⁰¹ Selective Serotonin Reuptake Inhibitors — I discuss these further in the Chapter 2 section on current treatments.

¹⁰² Anna Horáková, Hana Němcová, Pavel Mohr, and Antonín Šebela, “Structural, Functional, and Metabolic Signatures of Postpartum Depression: A Systematic Review,” *Frontiers in Psychiatry* 13 (2022): article 1044995, <https://doi.org/10.3389/fpsy.2022.1044995>.

¹⁰³ Achikam Haim, Candice Albin-Brooks, Michael Sherer, Elizabeth Mills, and Benedetta Leuner, “The Effects of Gestational Stress and Selective Serotonin Reuptake Inhibitor Antidepressant Treatment on Structural Plasticity in the Postpartum Brain: A Translational Model for Postpartum Depression,” *Hormones and Behavior* 77 (2016): 124–131, <https://doi.org/10.1016/j.yhbeh.2015.05.005>.

Tierney K. Lorenz, Hu Cheng, and Julia R. Heiman, “Neural Correlates of Emotion Processing Comparing Antidepressants and Exogenous Oxytocin in Postpartum Depressed Women: An Exploratory Study,” *PLOS ONE* 14, no. 5 (2019): e0217764, <https://doi.org/10.1371/journal.pone.0217764>.

focusing on amygdala activation. In the following chapter, I will give an overview of current treatments for PPD and then focus on the ways in which music therapies may offer powerful and significant potential for the development of new treatments.

Chapter 2: Comparing Apples to Oranges: Current Treatments and Efficacy

Chapter Introduction

In this chapter, I will briefly overview the current state of the research regarding treatments for Postpartum Depression (PPD), focusing on treatments involving music. I will discuss some challenges in developing effective treatments, including the broad-based and heterogenous use of the term ‘music therapy.’

As detailed in Chapter 1, PPD is a widespread and pervasive problem that affects women all over the world, in all kinds of living circumstances. Just as developing treatments for PPD is a complicated process, studying the treatments can be complicated too. Factors like maternal age, health history, ethnicity, location, education, marital status, and other categorical differences can be what are known as *confounding factors*, or factors that make it difficult to tell what is the actual cause of an observed effect. As we will see in this chapter, differences in study design, terminology and circumstances perpetually create difficulty in comparing and assessing the efficacy of interventions and treatments for PPD; frequently researchers end up trying to compare ‘apples to oranges.’ Even so, it is clear that more low-cost therapies that can help alleviate symptoms of PPD in new mothers are needed, particularly therapies that can benefit women without requiring them to travel or secure childcare.

Research into music-based treatments and interventions is an area of fruitful possibility. In the recent past, researchers have developed and studied the effects of various treatments for

PPD under the umbrella of the term “music therapy.” I will explain some of the challenges with the term music therapy, describe some of the interventions and how they differ, and their results.

Treatments for Postpartum Depression; Efficacy and Safety

In 2009, American psychologists Sona Dimidjian and Sheryl Goodman took on the large task of attempting to assess the relative efficacy of all treatments for PPD studied through randomized controlled trials (RCTs) to that date.¹⁰⁴ Both specialists in maternal mental health, they wanted to see how well these treatments worked when compared to each other. The title of this chapter may offer the reader a clue: idiomatically, comparing apples to oranges means attempting to compare two things that are too different to be compared. In this case, heterogeneity and confounding factors posed a significant challenge to assessing relative efficacies.

In their analysis, interpersonal therapy and cognitive behavioral therapy (CBT)¹⁰⁵ showed moderate improvements in symptoms relative to control groups receiving no treatment. Unfortunately, variability in study design, and comparatively few randomized controlled trials contributed to the difficulty of measuring the efficacy of talk-based therapies against pharmacologic therapies. Dimidjian and Goodman also included pharmacological therapy and different types of talk therapy; alternative and somatic therapies, like bright light therapy and acupuncture, and omega-3 fatty acid, and massage therapy and peer telephone based support. Of

¹⁰⁴ Dimidjian and Goodman, “Nonpharmacologic Intervention.”

¹⁰⁵ Dimidjian and Goodman, “Nonpharmacologic Intervention,” 500. I will return to CBT later in this chapter; its mechanism of action appears related to other ways in which researchers have identified maternal self-concept as a key to improving symptoms of PPD.

these, massage therapy had the most statistically significant improvement in symptoms besides antidepressant medication.¹⁰⁶ The other interventions did not show clearly attributable benefits.¹⁰⁷ The authors of this meta-analysis urged further research related to prevention and treatment of symptoms in perinatal women.

Although antidepressant medication is a common treatment for other depressive disorders, pregnant and postpartum women often hesitate to start using it out of concern for potential risks to a developing fetus or a nursing baby.¹⁰⁸ A 2010 survey of approximately four hundred mothers in Toulouse, France revealed that they found pharmacological treatments significantly less acceptable (meaning that the mothers felt they should not pursue them) than other treatments like talk therapy. The survey authors observed that this is important, because whether or not a mother finds a treatment to be acceptable influences the rate at which they will either continue the treatment or not.

Assessing pharmacological treatments requires analyzing a complex system of factors for risks and benefits, and I can personally vouch that pregnant and postpartum women are already carrying a heavy cognitive load. Even so, the mothers in the French study were *less likely* to find antidepressant medications acceptable *after receiving information* about them from clinicians. In fact, 95% of the mothers surveyed said they would pursue psychotherapy, with only 2% saying they would take antidepressants.¹⁰⁹ When I was nursing my children, I felt similarly. It is difficult

¹⁰⁶ Dimidjian and Goodman, “Nonpharmacologic Intervention,” 507.

¹⁰⁷ Dimidjian and Goodman, “Nonpharmacologic Intervention,” 509.

¹⁰⁸ Henri Chabrol, Frédérique Teissedre, Jane Armitage, Marine Danel, and Vera Walburg, “Acceptability of Psychotherapy and Antidepressants for Postnatal Depression among Newly Delivered Mothers,” *Journal of Reproductive and Infant Psychology* 22, no. 1 (2004): 5–12, <https://doi.org/10.1080/02646830310001643094>.

¹⁰⁹ Chabrol et al., “Acceptability of Psychotherapy and Antidepressants,” 5.

to overstate the degree to which messaging around potential harm to a fetus or nursing baby can make the calculation of risk relative to everyday choices feel cognitively staggering for a pregnant or new mother. Medicines, foods, and regular activities are all presented as potentially fraught with unnecessary risks that are the mother's fault for incurring. So, although avoiding medication might seem like an illogical or mistrustful view, this saturation of risk messaging combined with a comparative lack of research on the efficacy of antidepressant medications in postpartum mothers makes hesitation more understandable. In order to fully dispel this hesitation, logical or not, more research and better communication is required.

Although efforts have been made in the United States and elsewhere to address this, many common antidepressant treatments have not been as widely tested on women.¹¹⁰ Further, testing pharmacological treatments on pregnant women can be prohibitively difficult for health, ethical and legal reasons. In 2014, a group of Italian neuroscience and psychology researchers realized that there had been no recent systematic reviews to support the claim that selective serotonin reuptake inhibitors (SSRIs), a common type of antidepressant medication, were safe and effective for postpartum women.¹¹¹ Furthermore, in the history of their use with postpartum women, there had “been only one systematic review studying efficacy and safety of SSRIs, and the review included only one RCT.”¹¹² Reassuringly, they found there were no risks correlated with their use; however, only six trials met their criteria for inclusion. As usual, these trials were

¹¹⁰ Maria Puntarello, Giuseppe Davide Albano, Stefania Zerbo, Ginevra Malta, and Antonina Argo, “Sex Differences in Psychotropic Drug Exposure and Safety: A Systematic Review Toward Personalized Dosing Strategies,” *Journal of Personalized Medicine* 16, no. 4 (2026): article 189, 1, <https://doi.org/10.3390/jpm16040189>.

¹¹¹ Franco De Crescenzo et al., “Selective Serotonin Reuptake Inhibitors (SSRIs) for Post-Partum Depression (PPD): A Systematic Review of Randomized Clinical Trials,” *Journal of Affective Disorders* 152–154 (2014): 39–44, <https://doi.org/10.1016/j.jad.2013.09.019>.

¹¹² De Crescenzo et al., “Selective Serotonin Reuptake Inhibitors,” 41.

all very different in terms of antidepressants used, length of the study, and methodology.¹¹³ In 2014, a group of researchers in Oregon found a similar gap in research, concluding that the data available about PPD and SSRIs was not “adequate to allow informed decisions in treatment.”¹¹⁴ By comparison, in 1999, there had already been 98 randomized controlled trials of SSRI safety and efficacy in the general adult population.¹¹⁵

It is important to take a moment to clarify that my intention is not to mislead or to discourage mothers with PPD from taking antidepressants, or to imply that they are harmful. As described in Chapter 1, PPD is a dangerous illness that can result in maternal death. Mothers should be encouraged to value their own health and take antidepressant medicine if it helps them. Indeed, the Italian meta-analysis found a positive correlation with a reduction of depressive symptoms in postpartum women taking SSRI’s in three of the studies. However, the authors observed that it was not necessarily statistically significantly better than the other therapies.¹¹⁶

To summarize what we learned in the previous chapter, the neurological picture of postpartum depression is not quite the same as with other depressive disorders, in particular relative to amygdala activation. There is no separate diagnosis for PPD in the DSM-5 or the ICD, the two gold-standard diagnostic manuals for clinicians. Patterns of neurological activity are

¹¹³ De Crescenzo et al., “Selective Serotonin Reuptake Inhibitors,” 41.

¹¹⁴ Marian S. McDonagh, Annette Matthews, Carrie Phillipi, Jillian Romm, Kim Peterson, Sujata Thakurta, and Jeanne-Marie Guise, “Depression Drug Treatment Outcomes in Pregnancy and the Postpartum Period: A Systematic Review and Meta-Analysis,” *Obstetrics & Gynecology* 124, no. 3 (2014): 526–534, <https://doi.org/10.1097/AOG.0000000000000410>.

¹¹⁵ John R. Geddes, Nick Freemantle, James Mason, Martin Eccles, and Julie Boynton, “Selective Serotonin Reuptake Inhibitors (SSRIs) versus Other Antidepressants for Depression,” *Cochrane Database of Systematic Reviews*, no. 4 (1999): CD001851, <https://doi.org/10.1002/14651858.CD001851>. NB: Although this review was later withdrawn so the authors could incorporate their analysis into new reviews, the number of studies cited remains accurate.

¹¹⁶ De Crescenzo et al., “Selective Serotonin Reuptake Inhibitors,” 43.

different in postpartum mothers. Given that amygdala activation is one of the criteria measured to assess the efficacy of SSRIs,¹¹⁷ and increased amygdala activation seems to be part and parcel of new motherhood, it seems important for future assessments of the efficacy of therapies for postpartum depression to include postpartum mothers.

New pharmacological therapies are just beginning to take this need for clarity and specificity into account. Medicines like brexanolone and the newer zuranolone were developed to mitigate a drop in hormonal activity after birth, and both have shown promise in studies.¹¹⁸ Taken for a short period of time and tested specifically for use with postpartum women, brexanolone demonstrated significant and rapid reduction of symptoms in about 50% of women in recent clinical trials.¹¹⁹ However, brexanolone is administered via intravenous drip, and requires a 60 hour process. Zuranolone is a similar medicine, also developed specifically for postpartum women, and it is taken orally. Unfortunately, the price tag is steep: about 16,000 USD for a two week course, both medicines also have side effects like extreme drowsiness and potential loss of consciousness, and require close clinical supervision.¹²⁰

Researchers are also still not exactly sure what these medicines' mechanisms of action are, although preclinical studies in mice suggest that they may improve neural connectivity (in

¹¹⁷ Ruhé et al., "Successful Pharmacologic Treatment," 451.

¹¹⁸ Marla Broadfoot, "The Mother of Depressions: Postpartum Depression Is a Leading Cause of Death among New Mothers; A New Type of Drug Offers Better, Faster Treatment," *Scientific American* 333, no. 5 (December 2025): 52, <https://doi.org/10.1038/scientificamerican122025-3eWmLIOJ0KdJcY1OF8MSRy>.

¹¹⁹ Samantha Meltzer-Brody et al., "Brexanolone Injection in Post-Partum Depression: Two Multicentre, Double-Blind, Randomised, Placebo-Controlled, Phase 3 Trials," *The Lancet* 392, no. 10152 (2018): 1058, [https://doi.org/10.1016/S0140-6736\(18\)31551-4](https://doi.org/10.1016/S0140-6736(18)31551-4).

¹²⁰ Broadfoot, "The Mother of Depressions," 52.

postpartum mice).¹²¹ Further, researchers have also not yet identified biomarkers to determine which women will respond to these treatment, and about half do not. It is a cause for optimism that researchers are beginning to understand that treating postpartum depression medically will require medicines developed specifically for this unique condition. Nevertheless, there remains a significant need to develop effective treatments with few or no potential risks or side effects, and that are also available to mothers without logistical or financial hurdles.

Music Therapy and PPD

A review of the available literature concerning music therapy and postpartum depression again illustrates the title of this chapter: music therapy as a term is used widely to mean many different types, styles and methods of intervention. As we will see, studies using the term include interventions as diverse as passive listening alone to researcher-selected music and singing with a live therapist in a group of mothers. This makes it exceedingly difficult to compare and assess results across studies, because the mechanisms of efficacy (the reasons why the intervention might work) are not only very different, but very difficult to isolate. For example, in a group singing intervention, is it the singing or the social community that is providing a benefit? An overview of meta-analyses of research involving music and mood in the perinatal and postpartum period illustrates how difficult it can be to compare and assess these very different interventions, and their potential confounding factors.

¹²¹ Laverne C. Melón, Ryan Hammond, Megan Lewis, and Jamie Maguire, “A Novel, Synthetic, Neuroactive Steroid Is Effective at Decreasing Depression-Like Behaviors and Improving Maternal Care in Preclinical Models of Postpartum Depression,” *Frontiers in Endocrinology* 9 (2018): article 703, <https://doi.org/10.3389/fendo.2018.00703>.

A 2024 meta-analysis undertaken by researchers in China compared the results of 10 studies with a total of 988 participants who had received music therapy in an RCT.¹²² They found that overall, mothers receiving music therapy experienced improvement in their symptoms with a standardized mean difference (SMD) of -.61, meaning the the mothers' depression scores as measured by the EPDS improved by a little over half a standard deviation. The heterogeneity of the methods in the different trials was significantly high;¹²³ they included songwriting, music listening and singing at home. Another group of researchers in China found a statistically significant benefit of traditional Chinese Five Element based musical interventions on depressive symptoms in perinatal women, as measured by the EPDS.¹²⁴ Chinese Five Element music refers to a theory of correspondence between the five tones of the pentatonic scale and elements of the outer world and the body; in this study this theory was used to select music played for study participants. "The results of meta-analysis of random effects model demonstrated that five-element music had significance for improving maternal perinatal depression..." in their meta-analysis of 13 randomized controlled trials (RCTs) with 2387 patients, they found an SMD of -2.03, meaning the mothers' depression scores improved by slightly over two standard deviations.¹²⁵

¹²² Xiaoqing Sun et al., "Effect of Music Intervention on Perinatal Depressive Symptoms: A Meta-Analysis," *Journal of Psychiatric Research* 178 (October 2024): 78–87, <https://doi.org/10.1016/j.jpsychires.2024.08.004>.

¹²³ With an I scale percentage of 78%. Sun, et al, "Effect of Music Intervention," 78.

¹²⁴ Qi Wu, Zhijian Liu, Xiaoli Pang, and Ling Cheng, "Efficacy of Five-Element Music Interventions in Perinatal Mental Health and Labor Pain: A Meta-Analysis," *Complementary Therapies in Clinical Practice* 40 (2020): article 101217, <https://doi.org/10.1016/j.ctcp.2020.101217>.

¹²⁵ Wu et al., "Efficacy of Five-Element Music Interventions," 3.

In 2021, a team of Iranian researchers did a search and conducted a meta-analysis on research to date related to the effects of music therapy on postpartum anxiety and pain,¹²⁶ finding only four studies with usable data out of sixty initially identified through a search. They found a statistically significant reduction in postpartum anxiety and pain among women who received music therapy; however the heterogeneity of the studies led the researchers to recommend further investigation using standard tools, for example the Consolidated Standards of Reporting Trials (CONSORT).¹²⁷

It is important to note that no studies were identified that found a lack of value in applied music therapy; only a wide difference in approaches and a need for further research. All the meta-analyses discussed above agreed that music therapy was effective in alleviating depressive symptoms to some degree, and moreover, that the economy and ability of music to add to existing treatment made it a fertile choice for new studies.

Music Therapy and Self-Efficacy

A promising lens for development of music-based therapeutic approaches for postpartum depression has been the idea of self-efficacy. Self-efficacy refers to one's own self perception of competence relative to a task or domain, and research has demonstrated¹²⁸ that a negative sense of self-efficacy in new mothers is correlated with depressive symptoms. Using music therapy as

¹²⁶ Sevil Hakimi, Khadije Hajizadeh, Robab Hasanzade, and Minoos Ranjbar, "A Systematic Review and Meta-Analysis of the Effects of Music Therapy on Postpartum Anxiety and Pain Levels," *Journal of Caring Sciences* 10, no. 4 (2021): 230–237, <https://doi.org/10.34172/jcs.2021.033>.

¹²⁷ Hakimi et al., "Effects of Music Therapy on Postpartum Anxiety and Pain Levels," 236.

¹²⁸ Ruta Nonacs, "Maternal Self-Efficacy as a Risk Factor for Postpartum Depression and Anxiety," *MGH Center for Women's Mental Health*, April 13, 2021, <https://womensmentalhealth.org/posts/maternal-self-efficacy-as-a-risk-factor-for-postpartum-depression-and-anxiety/>

a tool given to mothers to soothe babies or modulate their own emotions has the potential to impact their sense of self-efficacy.

In his 2016 article discussing the methods and mechanisms of music therapy in pregnant women, Wolfgang Mastnak brings up the concept of cognitive adjustment, referring to the way we contextualize and frame new experiences.¹²⁹ In his analysis of studies involving music therapy, he posits that when music therapy is “resource-oriented,” meaning when it is approached as a tool given to a patient to use “to support and enhance life adjustment,”¹³⁰ it has a positive effect on self-concept. He explains,

Music therapeutic approaches...are typically based on the very unique features of the dyad human and music: music-induced trance triggering mental self-organization and life readjustment, music-guided readjustment of life philosophies and one’s self-concept, and musically controlled energy and mood regulation. As these approaches are mostly not conflict-centered but resource-oriented, they are not likely to generate unfavorable pathological self-labeling.¹³¹

As described in Chapter 1, research suggests that new mothers’ perception of themselves as ‘bad mothers’ can significantly contribute to depressive symptoms, so this use of music seems particularly well-suited to therapeutic approaches for this population. It also resonates with my own experience as a young mother with PPD, as I will discuss in Chapter 5. Further, it shares features with another interventional method that the previously referenced meta-analyses showed to benefit mothers with PPD: Cognitive Behavioral Therapy.¹³²

¹²⁹ Wolfgang Mastnak, “Perinatal Music Therapy and Antenatal Music Classes: Principles, Mechanisms, and Benefits,” *Journal of Perinatal Education* 25, no. 3 (2016): 184–192, <https://doi.org/10.1891/1058-1243.25.3.184>.

¹³⁰ Mastnak, “Perinatal Music Therapy and Antenatal Music Classes,” 186.

¹³¹ Mastnak, “Perinatal Music Therapy and Antenatal Music Classes,” 186.

¹³² Dimidjian and Goodman, “Nonpharmacologic Intervention.”

Cognitive Behavioral Therapy, or CBT, is a type of talk therapy developed by psychologist Dr. Aaron Beck in the 1960's. The fundamental practices of CBT involve making a patient aware of their *maladaptive thinking*; automatic, negative, narrative thoughts that someone experiences about themselves, others or situations.¹³³ The therapeutic process then helps the patient to intentionally reframe or replace those beliefs.¹³⁴ Mastnak's "cognitive adjustment" through music echoes CBT conceptually.

As we saw in Dimidjian and Goodman's 2009 meta-analysis of the relative efficacies of different therapies, data suggest that CBT on its own is a helpful therapeutic avenue for PPD. Study results also suggest this similar potential of music to help mothers to reframe their self-efficacy has value. Analysis of participant interviews from a parent education program in London focused on teaching singing through the lens of maternal self-efficacy revealed a persistent sense of improvement, up to two weeks following the intervention, in mothers' sense of competence and ability to soothe their babies, as well as persistent improvement in scores on the EPDS.¹³⁵ Qualitative interviews from a musical intervention in Ireland, in which women were taught to sing lullabies to their infants, revealed themes of music being able to express deep emotions and mothers' sense of having a skill both to use with their infants, and manage their own emotions, contributing to their sense of self-concept.¹³⁶ As Mastnak notes, "Self-efficacy, particularly, has become an important factor in psychosomatic health care. An individual's awareness of self-

¹³³ Judith S. Beck, *Cognitive Behavior Therapy: Basics and Beyond*, 2nd ed. (Guilford Press, 2011), 20.

¹³⁴ Beck, *Cognitive Behavior Therapy*, 20.

¹³⁵ Helen Shoemark, Marie Dahlström, Oscar Bedford, and Lauren Stewart, "The Effect of a Voice-Centered Psycho-Educational Program on Maternal Self-Efficacy: A Feasibility Study," *International Journal of Environmental Research and Public Health* 18, no. 5 (2021): article 2537, <https://doi.org/10.3390/ijerph18052537>.

¹³⁶ Mary Carolan, Maebh Barry, Mary Gamble, Kathleen Turner, and Óscar Mascareñas, "Experiences of Pregnant Women Attending a Lullaby Programme in Limerick, Ireland: A Qualitative Study," *Midwifery* 28, no. 3 (2012): 321–328, <https://doi.org/10.1016/j.midw.2011.04.009>.

competence, that involves the ability to control possible pathological risks and conditions, maintains and enhances emotional stability and holistic well-being.”¹³⁷

In another study conducted at Montefiore Hospital in the Bronx, a socioeconomically and racially diverse community in New York City, researchers provided one session of bedside music therapy to almost three hundred women hospitalized postpartum with symptoms of depression over the course of fifteen months.¹³⁸ Even though the women only received one session each with the music therapist, the qualitative interviews were filled with glowing praise for the experience. They described significant improvement of symptoms during and post-intervention, particularly with regard to the mothers’ sense of having a tool to soothe their babies, with one woman writing, “I’m very happy because I’m learning how to understand my baby.”¹³⁹ While the intervention correlated with increases in the mothers’ sense of self-efficacy, unfortunately, no longitudinal data was collected to assess the persistence of benefits.¹⁴⁰ Nevertheless, this study valuably contributed to the advancement of music therapy research in postpartum women, and demonstrated that hospitals and practitioners already providing care for women with PPD are in a unique position to test the effects of adding music therapy to treatment.

Returning to the idea of confounding factors and the particular efficacy of music, in 2018 a group of researchers in the UK created a randomized controlled trial with the aim of identifying benefits of music therapy for women with PPD when compared to other creative therapies. In

¹³⁷ Mastnak, “Perinatal Music Therapy and Antenatal Music Classes,” 186.

¹³⁸ Kristen Corey, Ronit Fallek, and Maya Benattar, “Bedside Music Therapy for Women During Antepartum and Postpartum Hospitalization,” *MCN: The American Journal of Maternal/Child Nursing* 44, no. 5 (2019): 277–283, <https://doi.org/10.1097/NMC.0000000000000557>.

¹³⁹ Corey, Fallek, and Benattar, “Bedside Music Therapy,” 282.

¹⁴⁰ Corey, Fallek, and Benattar, “Bedside Music Therapy,” 283.

this study, led by Daisy Fancourt and Rose Perkins, fifty-four mothers were assigned to either a music, creative play, or control group and participated over ten weeks.¹⁴¹ Qualitative interviews were analyzed afterward for themes, with the goal of identifying specific differences relative to the impact of music therapy. The researchers found that in all creative therapies, there were shared benefits including a sense of community and a positive activity for mothers to do with their babies.¹⁴² However, the mothers in the music group experienced a notably faster improvement of symptoms than the mothers in the creative play group. Mothers in the music group spoke to a specifically “relaxing and immersive” experience with the music, and sense of improved positive identity or self-concept.¹⁴³

Another study that explored the use of music as a tool for mothers was conducted with one hundred and twenty women in Düsseldorf, Germany.¹⁴⁴ A baseline was taken one to three days after birth using the State-Trait-Anxiety Inventory and the EPDS, and attachment of mother to baby was measured using the German Postpartum Bonding Questionnaire.¹⁴⁵ Mothers and babies in the experimental group came every two weeks to participate in a session where they learned how to sing songs and play finger games with the babies, completing the inventory assessments and providing a cortisol sample before and after the intervention. The mothers were also instructed to sing to their babies at home every day. Researchers found statistically

¹⁴¹ Daisy Fancourt and Rosie Perkins, “Effect of Singing Interventions on Symptoms of Postnatal Depression: Three-Arm Randomised Controlled Trial,” *British Journal of Psychiatry* 212, no. 2 (2018): 119–121, <https://doi.org/10.1192/bjp.2017.29>.

¹⁴² Fancourt and Perkins, “Effect of Singing Interventions,” 120.

¹⁴³ Fancourt and Perkins, “Effect of Singing Interventions,” 120.

¹⁴⁴ Verena Wulff, Philip Hepp, Oliver T. Wolf, Tanja Fehm, and Nora K. Schaal, “The Influence of Maternal Singing on Well-Being, Postpartum Depression and Bonding: A Randomised, Controlled Trial,” *BMC Pregnancy and Childbirth* 21, no. 1 (2021): article 501, <https://doi.org/10.1186/s12884-021-03933-z>.

¹⁴⁵ Wulff et al., “Influence of Maternal Singing,” 1.

significant improvements in ratings and cortisol levels immediately post-session, but the effects did not persist ten weeks post intervention, and while the mothers' symptoms decreased over time, they did not decrease in a statistically significant way relative to the normative decreasing of PPD symptoms over time.¹⁴⁶ According to the study authors, "However, correlation analysis revealed that the frequencies of the use of music and singing at home were associated with improved well-being and mother-infant attachment independent of group allocation."¹⁴⁷ Unfortunately no measurements were taken from a control group for comparison. This study illuminates the need for more longitudinal research, and potentially a longer duration of interventions for postpartum mothers.

As we learned in the previous chapter, current neuroimaging research into PPD reveals both differences and similarities to major depressive disorder. As previously discussed, the perinatal and postpartum period are a time of dynamic brain changes in all mothers, and the specific neurological mechanisms associated with postpartum depression seem to differ in key ways from other major depressive disorders. Key factors to consider in the design and assessment of therapies would include effects on the brain that might overlap, but differ, depending on whether the brain in question is listening, participating in making, or creating music. When considering music as a potential therapy for PPD, getting clarity on how these effects manifest depending on the musical activity is important for interventional design.

In that vein, several studies show an association between increased activity in the amygdala and emotional processing of music. In 2016, a group of Scandinavian researchers

¹⁴⁶ Wulff et al., "Influence of Maternal Singing," 12.

¹⁴⁷ Wulff et al., "Influence of Maternal Singing," 13.

conducted a study looking for differences in brain activation when listening to music, between musicians and non-musicians.¹⁴⁸ They found in their literature review that “neural correlates of sadness and happiness in music consistently highlighted the role of medial frontal cortices, amygdala, and striatum in generating these emotions,” and in their own fMRI study, increased amygdala activation with sad music in both groups.¹⁴⁹

To re-iterate an area of inquiry from the previous chapter, and with an awareness of my perspective as a researcher outside of a clinical field, I would encourage further study of the amygdala’s role in non-depressed postpartum mothers, compared to mothers with PPD. It would seem to be of benefit to clarify that perhaps either the amygdala is supposed to be playing a different role in this population, or, that it is a disconnection rather than hypo- or hyperactivation that is correlated with depressive symptoms in new mothers. That clarification would then help to guide the design of interventions for PPD generally. Specific to this dissertation and my study, the potentially different role of the amygdala in PPD, coupled with my own experience, guided me to choose individual music creation for its neurological potential, rather than passive listening or group music interventions. I will discuss this in more detail later in this chapter.

In summary, although studies related to music therapy and perinatal and postpartum depression are heterogenous in design, methods and scope, there is broad agreement that music has positive effects when used therapeutically in peri- and postnatal mothers. There is a clear opening for further research that identifies the specific mechanisms of these perceived therapeutic benefits on a neurological level.

¹⁴⁸ Elvira Brattico, Brigitte Bogert, Vinoo Alluri, Mari Tervaniemi, Tuomas Eerola, and Thomas Jacobsen, “It’s Sad but I Like It: The Neural Dissociation between Musical Emotions and Liking in Experts and Laypersons,” *Frontiers in Human Neuroscience* 9 (2016): 2, <https://doi.org/10.3389/fnhum.2015.00676>.

¹⁴⁹ Brattico et al., “It’s Sad but I Like It,” 2.

Neurologic Music Therapy

As a part of the theoretical framework for the design of my own study, I turned to the field of Neurologic Music Therapy. As described throughout this chapter, while many studies describe benefits related to music therapy and women's perinatal and postpartum experience, the diversity of methods and definitions makes it difficult to identify and isolate specific candidate mechanisms of improvement. Neurologic Music Therapy (NMT) is a discipline that was specifically developed to quantify, assess, and recommend specific musical treatments based on the mechanisms by which they functionally improve physical, neurological and emotional symptoms, either directly, or by way of harnessing a parallel process in the brain.¹⁵⁰

In the early 1980s, researcher Michael Thaut began to study the potential of music therapy to treat autistic children, drawing connections between the verbal, social, and sensorimotor issues experienced by autistic children, and the music's effect on the brain in each of those areas.¹⁵¹ Based on that research, Thaut and a group of researchers began to explore a shift from music used relationally and emotionally, to music used as sensory and neurological stimulus. In Thaut's words, "music therapy would need to extend its potential from techniques for establishing relationships to the providing of sensory stimulation according to...perceptual dysfunctions."¹⁵² This transition served as the underlying philosophy for Thaut and his colleagues, driving them to integrate music into the realm of measurable, replicable, scientific

¹⁵⁰ Michael H. Thaut and Volker Hoemberg, eds., *Handbook of Neurologic Music Therapy*, 1st ed. (Oxford University Press, 2014), 2.

¹⁵¹ Michael H. Thaut, "Music Therapy as a Treatment Tool for Autistic Children" (master's thesis, Michigan State University, 1980).

¹⁵² Thaut, "Music Therapy as a Treatment Tool," 33.

practices for therapeutic purposes.¹⁵³ During the early stages of neurologic music therapy's development, research followed two main streams, as we will see below: one sought to comprehend how music influences neurological processes and brain activity, while the other aimed to leverage this understanding to achieve therapeutic goals beyond music, including areas specifically relevant to the research questions of this dissertation, e.g. mood and affective disorders.

Initial investigations into the impact of music therapy on individuals' moods revolved around its effects on mood relative to other cognitive functions. In 1993, Thaut and Shannon De l'Etoile conducted an experiment to gauge how music influenced the memory of participants in specific emotional states.¹⁵⁴ Their study was built upon prior findings indicating that moods influence memory, a phenomenon known as mood-state dependent recall effect. Three groups took part: one group experienced deliberate mood induction through music, another group had music playing in the background, and a third group experienced no music at all. Thaut and De l'Etoile discovered that the group subjected to mood induction through music exhibited the highest accuracy in recalling information, and de l'Etoile later replicated these findings in 2002.¹⁵⁵ While these studies didn't incorporate neuroimaging technology or measure brain activity directly, they laid the foundation for their later studies combining cognitive tasks with imaging to quantitatively assess music's therapeutic impact on brain function and activation.

¹⁵³ As this is an interdisciplinary work, it bears reiterating here that beginning in Chapter 3, I will include retrospective autoethnography, a framework which takes as data people's individual emotional and relational experiences, to incorporate my subjective experience into my research, so I do not necessarily view the gap between relationships and data that Thaut describes as motivating his foundational work.

¹⁵⁴ Michael H. Thaut and Shannon K. de l'Etoile, "The Effects of Music on Mood State-Dependent Recall," *Journal of Music Therapy* 30, no. 2 (1993): 70–80, <https://doi.org/10.1093/jmt/30.2.70>.

¹⁵⁵ Shannon K. de l'Etoile, "The Effect of a Musical Mood Induction Procedure on Mood State-Dependent Word Retrieval," *The Journal of Music Therapy* 39, no. 2 (2002): 145. <https://doi.org/10.1093/jmt/39.2.145>.

In 2012, de l'Etoile and other researchers developed a rubric outlining levels of study design in neurologic music therapy, according to how clinically robust they determined the studies to be.¹⁵⁶ They defined *musical parallel models* as basic research to find out information about neurological, physiological or psychological responses to, or perception of, music or musical behaviors. These can inform applied research at the next level — *nonmusical parallel models*, which investigate neurological connections between musical perception or activity, and nonmusical activity. Results from the first two levels of study can be used to develop *mediating models*, which are assessments of the effects of a musical intervention on behavior or activity that can be reproduced reliably. The top level of study design consists of *clinical research models*, which aim “to investigate the effect of a therapeutic protocol in an effort to promote a lasting change in patients’ functional behavior.”¹⁵⁷

At the date of this writing, searches using OMNI and Google scholar result in 400+ results using the terms “Neurologic Music Therapy” and postpartum or perinatal depression, but analysis of these results retrieved revealed no studies deliberately using NMT methodology to address PPD symptoms, only coincidental occurrences of common terms. I would like to clarify that this does not mean that no such studies exist, nor does it mean that robust, clinically sound music therapy studies have not been conducted in this domain; rather that the particular lens of NMT study design and vocabulary does not seem yet to have been applied here. To return to Mastnak, he notes (and the broader body of research taken together supports) that:

¹⁵⁶ Shannon K. de l'Etoile, Carolyn Dachinger, Joy Fairfield, and Linda Lathroum, “The Rational-Scientific Mediating Model (R-SMM): A Framework for Scientific Research in Music Therapy,” *Music Therapy Perspectives* 30, no. 2 (2012): 130–140, <https://doi.org/10.1093/mtp/30.2.130>.

¹⁵⁷ de l'Etoile et al., “Rational-Scientific Mediating Model,” 132.

Music is very likely to exert multiple influences on a patient, e.g., at the same time supporting motor rehabilitation and evoking music-associated biographical memories. On the other side we have to take into account that diseases often may be traced back to very different roots and pathological mechanisms and consequently require complex treatments, such as medication, occupational therapy, psychotherapy, music therapy, etc. Analysing and evaluating therapeutic procedures has to respect these basic principles.¹⁵⁸

By using the principles of Neurologic Music Therapy as part of the theoretical foundation for my case study design, I hope to suggest a research direction for future empirical studies using neuroimaging to assess the therapeutic potential of music creation for women with PPD. I will describe my study design in detail in Chapter 6; below is an example of a characteristic NMT intervention.

NMT Study Framework and Rationale

The following is an example of an NMT intervention from the Handbook of Neurologic Music Therapy, 2014:

Active and receptive therapeutic music exercises can be used to facilitate the “feeling” experience of emotion, the identification of emotion, the expression of emotion, the understanding of emotional communication of others, and the synthesis, control, and modulation of one’s own emotional behavior.

Skill/area targeted: Recognition and expression of emotions

Age group: Adults or adolescents; children at a simpler level

Setting: Group

Equipment needed: A range of simple percussion and melodic instruments

Step-by-step procedure:

1. Form the group into a circle
2. Each group member selects an instrument that they will use to represent an emotion
3. The leader/therapist directs all the participants to improvise in order to portray changes in emotional states (from 1 to 5) where 0 is very sad, 3 is neutral, and 5 is very happy.

¹⁵⁸ Mastnak, “Perinatal Music Therapy and Antenatal Music Classes,” 10.

4. Each individual plays a specific emotion and also practices playing and/or adjusting to others' emotional states, from 1 to 5
5. The same activity is now performed in reverse (from 5 to 1) to demonstrate and practice emotional control
6. Experiment with the form ABACAD with each letter standing for a different emotion, alternating emotions¹⁵⁹

The above intervention seems almost deceptively simple, and the brevity of its description might obscure its therapeutic potential. I speculate that benefit could derive from both giving the participants the awareness of their own subjective understanding of a particular emotion expressed through music, and then immediately having them use that subjective understanding to practice expressing emotions that they are not currently experiencing. As discussed earlier in this chapter, this is very similar to the reframing principles of CBT. In Chapters 4 and 5 I will discuss in detail my own experience using music in this way to scaffold an increased ability to process and manage negative emotions and offer an improved sense of self-efficacy while I was living with PPD.

This reframing is a perceptual or psychological benefit that goes hand in hand with the broad neurological activation and connection that comes with making and listening to music; the “physiologically complex cognitive, affective and sensorimotor processes”¹⁶⁰ Thaut set out to harness. I deliberately chose music *creation* as the musical process to harness for my study design both because of my own experiences as a composer, and because it is worth exploring that current research suggests creating music is correlated with increased functional connectivity

¹⁵⁹ Thaut and Hoemberg, *Handbook of Neurologic Music Therapy*, 341.

¹⁶⁰ Thaut and Hoemberg, *Handbook of Neurologic Music Therapy*, 4.

between and among regions of the brain.¹⁶¹ Building off earlier studies that demonstrated increased neural connectivity in improvising musicians,¹⁶² in 2022 a collaborative of researchers from Chinese and Canadian universities conducted an fMRI study of eighteen composers and twenty control subjects. The researchers findings suggested that composers had “better connectivity, greater integration, and more efficient information transfer,” compared to the control group, finding stronger connections between and among structures in the brain including the orbitofrontal cortex and dorsal and ventral attention networks as well as stronger connections and integrity in their white matter.¹⁶³

Although this is a small study, and although broad activation of distributed systems and structures in the brain is correlated with many musical activities, including listening,¹⁶⁴ the potential increased connectivity of music creation (rather than just specific regional or structural activation) is worth further empirical investigation. It is particularly worthwhile as a direction given that it may be disconnection or disassociation of the amygdala that is correlated with depressive symptoms in postpartum mothers, rather than its over- or under- activation. This neurological potential, combined with my subjective experience as a creator of music with postpartum depression — specifically, that making music was a profoundly useful tool to me in processing my own experiences — led me to choose music creation to explore as a therapeutic

¹⁶¹ Rui Ma, Lin Feng, Xiaoli Guo, Shanshan Guo, Shuyu Long, Hua Yang, and Jing Lu, “Effects of Music Composition on Structural and Functional Connectivity in the Orbitofrontal Cortex,” *Brain-Apparatus Communication: A Journal of Bacomics* 3, no. 1 (2024): article 2346498, <https://doi.org/10.1080/27706710.2024.2346498>.

¹⁶² Roger E. Beaty, “The Neuroscience of Musical Improvisation,” *Neuroscience & Biobehavioral Reviews* 51 (2015): 108–117, <https://doi.org/10.1016/j.neubiorev.2015.01.004>.

¹⁶³ Ma et al., “Effects of Music Composition,” 13.

¹⁶⁴ Victor Pando-Naude, Agata Patyczek, Leonardo Bonetti, and Peter Vuust, “An ALE Meta-Analytic Review of Top-Down and Bottom-Up Processing of Music in the Brain,” *Scientific Reports* 11, no. 1 (2021): 20813, <https://doi.org/10.1038/s41598-021-00139-3>.

approach. Musicmaking carries the additional advantages of having no pharmacological side effects; it can be done at low cost, and it is a skill that can be taught and used for a lifetime. It would make designing and delivering music based therapies easy if everyone felt that they had the capacity to make music on their own. Unfortunately, multiple factors contribute to everyday people feeling like they do not have the capacity to create their own music. I will discuss these factors in the following chapter.

Chapter 3: Language, Educational Culture and Society

Chapter Introduction

As a musician, composer, and teacher, I have frequently observed that most ‘regular’ people don’t think that they can make their own music. In this chapter I will describe social, cultural and educational factors I identify as contributing to the common belief that making music is something that requires an inborn talent to make; moreover, that it is difficult and requires specialized technical knowledge to do correctly and well. This perception of inaccessibility to the layperson would appear to be an interesting feature of the cultures of both art and science: in their 2009 work “The Artistic Turn,” authors Kathleen Coessens, Darla Crispin and Anne Douglas describe this perceptual gap, observing that both art and science “sit on a continuum with the broad range of ordinary human capacities. Everybody can ‘draw’, or can ‘make music’, at his or her personal level of ability, and the impulse to engage in such activities in some form or another appears almost universal. Regular people do all kinds of artistic and scientific things, but then they aren’t considered artists and scientists.”¹⁶⁵ As this chapter will discuss, nor do they consider themselves to be. This dissertation seeks to purposefully inquire and communicate across disciplines; as such, this chapter intentionally mixes modes, and my own experiences are interwoven as autoethnographic examples alongside sociological research and empirical data.

I will begin with one such experience. A recent, real-life example of this limiting belief in the inaccessibility of music making manifested when an art teacher in the audience of a

¹⁶⁵ Coessens et al, *The Artistic Turn*, p. 37-8.

soundscape performance I was giving came up to me afterwards and said “You’re so talented. I could never do what you do.” With no ego involved, I can say almost certainly that I could have taught her to do what I was doing, which was creating a soundscape from tones and natural field-recorded sounds. I was essentially playing back recordings that I had made, and choosing their relative loudness, layering, and timing. It’s not something that requires *no* skill or taste, but it’s not rocket science either.

It is an unfortunate paradox that these self-limiting views seem to emerge from the way music is frequently taught and spoken about in the educational world. As I will explain, these beliefs stem from the way music is taught both in schools and in private lessons and conservatories, as well as from the way we discuss music as a culture. This chapter will discuss factors including the language commonly used to describe music; pedagogy in the United States, Canada and Europe, and how funding can drive educational priorities. I will explain why I think these factors contribute to a limiting self-concept relative to music in the general population. I will also discuss my own early experiences with music instruction and describe the ways they impacted my self-concept as a musician and creator of music.

**Why don’t most people think they can make their own music?
Because of the way we talk about it**

In 2016, I gave the keynote speech to a group of high school musicians selected for the prestigious honor of induction into the Tri-M Music Honor Society. This organization is under the umbrella of the National Association for Music Education, and it recognizes students in the

United States for what the society considers to be outstanding achievements in music. At the time, I had recently completed writing, recording and producing my third album of original music, and felt very strongly that it was important these students knew someone saw how misunderstood the nature of creating is.

I told them, “I wasn’t aware that to create, in itself, is actually a series of cascading choices — ... I was — I don’t want to say misled, but certainly confused, by the way both my immediate community, and our larger culture, seemed to view creation: not as something necessary, or as serious work, but something sort of magical and slightly frivolous.” I asked them if they had encountered that perception in their work, and saw many nodding heads when I gave examples of things people had said to me about my compositions: “Wow, that’s so pretty! I could never do that!” “You have such a nice voice!” “You must be SO TALENTED.” “Does it run in your family?” “That must be so much fun!” I concluded by saying, “It’s not a magic trick. It’s more like building a birdhouse. Almost everyone can learn to do it. What it mostly requires is the choice to invest time and effort and intention in getting good at doing it.”

This description of music as *work*, and the distance between that work and how it is often described, seemed to resonate strongly with the young musicians in the audience, at least as far as I could tell from their murmuring. Afterward, one parent reached out to let me know my assessment was correct. “Lyric (my musician) talked about it when we got home,” she wrote, “and said that all of the artists were quietly saying “yes, yes, yes” as you rhetorically asked if they had heard certain things about the beauty and talent of artists.”¹⁶⁶

¹⁶⁶ Kelly Ortago Mcvov, message to author, 2016, used with permission.

The way we describe creation impacts our ability to create. To help human beings fulfill their creative potential, an understanding of this defining process is key. While talent is certainly one element contributing to the conditions necessary for someone to create their own music, it is not necessarily the most important one. In fact, focusing on talent when we talk about creation often causes the unintended consequence of making it harder to create. This is my opinion, based on experience, but certainly not only mine, and I will bring in other voices to support it below.

As a young child, I demonstrated a natural ability for mimicry, accurate and expressive singing, and picking things out by ear on the piano. My parents were very young when they had me, and I know their intention was to encourage me, but the way they spoke about my abilities created a weird dissonance, almost like my ability was separate from me as a person. Like the audience members I described earlier, their praise focused on talent and beauty, both qualities that are intrinsic and unchangeable. My takeaway from the way my relationship with music was discussed was that I was good at it because I could inherently do it. Although I didn't realize what was happening at the time, the emphasis on my *talent* resulted in me feeling like I had to act as if music came very easily to me. My understanding was, my artistic value was connected to my natural talent, so if I was to be of value, then music had to be effortless for me. Now that I teach twice-exceptional students, I have found out that this is a common struggle for gifted and twice-exceptional kids, but it's also very much exacerbated by the way that people think about and talk about talent, music, and creativity. I am deeply glad that my early training as a teacher taught me a different way to think and talk about this process; I will discuss this further in Chapter 6.

Growth Mindset

The way we tend to talk about creativity as a culture is very heavy on the magic and very light on the mechanics. It's lacking in what we now commonly refer to as *growth mindset*, a theory developed by Carol Dweck, and detailed in her 2007 book *Mindset: The New Psychology of Success*. *Growth mindset* is essentially the theory that an individual's capacity in most domains is flexible, and moreover that a belief in one's capacity to learn new skills actually boosts one's ability to learn those skills.¹⁶⁷ Conversely, a *fixed mindset* describes the belief that talent and skill are inborn, products of the genetic lottery. Dweck writes about the development of her own conception of creative talent and identity, and the difference in how intellectual versus creative abilities are regarded.

The intellect is so multifaceted. You can develop verbal skills or mathematical-scientific skills or logical thinking skills, and so on. But when it comes to artistic ability, it seems more like a God-given gift....Even I believed this. While some of my friends seemed to draw beautifully with no effort and no training, my drawing ability was arrested in early grade school. Try as I might, my attempts were primitive and disappointing. I was artistic in other ways. I can design, I'm great with colors, I have a subtle sense of composition. Plus I have really good eye-hand coordination. Why couldn't I draw? I must not have the gift.¹⁶⁸

Dweck's view of her own creative potential didn't change until she read a book called *Drawing on the Right Side of the Brain*, by Betty Edwards. Edwards described a process wherein anyone could learn to improve their drawing, with careful and explicit instruction, over the course of five sessions. Dweck was struck by the drastically different "before" and "after" pictures, drawn by participants. She goes on to explain that she learned from Edwards that while

¹⁶⁷ Dweck, *Mindset*.

¹⁶⁸ Dweck, *Mindset*, 72.

most view creativity as “a magical ability that only a select few possess,” this is predominantly because “people don’t understand the components,” and although some people seem to naturally pick up these component skills over the course of their lives, others need to work to acquire them. However, Dweck’s quite important takeaway from this process is this: “Just because some people can do something with little or no training, it doesn’t mean that others can’t do it (and sometimes do it even better) with training.”¹⁶⁹

Dweck’s theory of growth mindset has inspired significant research in recent years. Researchers have designed many interventions in domains as diverse as education, marketing, business and the arts¹⁷⁰ to measure the effects of adopting a growth mindset on people operating in these domains.

In writing my speech for the Tri-M Society, I drew my explanation of the popular idea of creativity as magic from my own personal experience as a composer and performer, but it is widely pervasive, even frequently perpetuated by people who do it for a living. In his book *Off the Record*, songwriter Graham Nash of the renowned 1970s folk-rock group Crosby, Stills and Nash, interviewed many other famous songwriters about their processes.¹⁷¹ Although some answered with an understanding of creativity as work, most contributed to this cultural myth that the ability to write music is a magic accident of talent and birth.

For example, asked about the relationship of inspiration to music-making, American songwriter Randy Bachman said “I think that most songwriters will tell you that some magical

¹⁶⁹ Dweck, *Mindset*, 75.

¹⁷⁰ Jeni L. Burnette, Joseph Billingsley, George C. Banks, Laura E. Knouse, Crystal L. Hoyt, Jeffrey M. Pollack, and Stefanie Simon, “A Systematic Review and Meta-Analysis of Growth Mindset Interventions: For Whom, How, and Why Might Such Interventions Work?,” *Psychological Bulletin* 149, nos. 3–4 (2023): 174–205, <https://doi.org/10.1037/bul0000368>.

¹⁷¹ Graham Nash, *Off the Record: Songwriters on Songwriting* (Kansas City: Andrews McMeel Publishing, 2002).

thing can happen and a song just drops in your lap.”¹⁷² Folk songwriter L. Russell Brown said his most successful songs were “the ones I didn’t ‘write,’” and “I don’t ever sit down and just try to come up with a new idea.”¹⁷³ Wayne Carson produced the gem, “Well, nobody is ever going to teach anybody how to write a song.”¹⁷⁴ What fascinates me the most about these quotes is that it’s clear that these were hardworking, prolific songwriters and creators of music. I would never describe their work as a lucky accident. They just seem not to have brought a conscious awareness of the *work* part into their own conception of creation, at least at the time of their interviews.

Similarly, in an effusive 2011 profile for *Vogue*, writer Jonathan van Meter writes of Lady Gaga:

Of course she's comfortable onstage. She has been playing the piano since she was four and by eleven was performing in big recitals. As she puts it, I was a strange, loud little kid who could sit at the piano and kill a Beethoven piece. Still showing no false modesty, Lady Gaga says of herself now, “Speaking purely from a musical standpoint, I think I am a great performer. I am a talented entertainer. I consider myself to have one of the greatest voices in the industry. I consider myself to be one of the greatest songwriters. I wouldn't say that I am one of the greatest dancers, but I am really quite good at what I do.” Big words from someone who's only been around for three years. “I think it's OK to be confident in yourself,” she says. “I wrote it in ten fucking minutes, she says, and it is a completely magical message song. And after I wrote it, the gates just opened, and the songs kept coming. It was like an immaculate conception.”¹⁷⁵

The focus on her youth and talent in the description gives a strong impression that these are intrinsic qualities. Her own statement describes a “magical” process that is out of her own

¹⁷² Nash, *Off the Record*, 14.

¹⁷³ Nash, *Off the Record*, 23.

¹⁷⁴ Nash, *Off the Record*, 33.

¹⁷⁵ Jonathan Van Meter, “Lady Gaga: Our Lady of Pop,” *Vogue*, February 2011, <https://www.vogue.com/article/lady-gaga-our-lady-of-pop>.

control. I do not understand why someone as clearly hardworking as Lady Gaga would describe creating in that way, but the underlying takeaway when she does is that her work is a magic blessing or an accident of birth, and not a combination of effort and skills.

Because of the way we teach it

In his 2016 article “Creativity in the College Music Classroom,” researcher, educator and author Timothy Chenette describes the frequent disconnect between the way music is taught and the concept of creativity.¹⁷⁶ Chenette explains that although music is thought of as a domain of creativity, “merely interacting with a creative art does not guarantee creative practice, and it is common to hear of students who feel that the particular ways in which post-secondary music training often involves subjecting music to rules, memorizing facts and ideas, having required work, and being graded has removed the creativity from their involvement with music.”¹⁷⁷ Although he is talking about post-secondary music education, this was my experience of music teaching beginning in childhood.

With innocent exuberance, when I was seven years old I decided to write my first symphony. I had read a glowing biography of Mozart, child prodigy, and I thought if he could do it, there was probably no reason why I couldn’t too. I painstakingly wrote out notes on manuscript paper that my mother had; lines for the violin, the harp, a tuba. When I showed it to my music teacher, he reacted with a rigid incredulity; things weren’t in the same key! These

¹⁷⁶ Timothy K. Chenette, “Creativity in the College Music Classroom: Guidelines for Effective Integration,” *College Music Symposium* 56 (2016), <https://www.jstor.org/stable/26574420>.

¹⁷⁷ Chenette, “Creativity in the College Music Classroom.”

instruments couldn't play these notes! Instead of responding with encouragement or explaining range (or giving me any actionable feedback at all) he made me feel belittled, embarrassed and faulty. This was one of a few experiences that led me to stop trying to create my own music for some time, and stick to performing other people's. When my mother moved houses several years ago, I hoped that piece of manuscript paper might turn up so that I could be retroactively kind to my child self, but it did not.

Music education is not only a very personal thing, but a very unpredictable one in terms of potential experiences and takeaways. For every student that gets a great teacher who inspires, there is another whose experiences turn them off completely. In my childhood home, there was a Story and Clark baby grand piano in the sunroom. It was a beautiful, gently luminous natural wood finish, almost a copper color. I loved that piano like you would love a family pet. In my article for IAWM "Everyone Should Feel Welcome," I wrote about my early experiences with that piano.

Before beginning formal instruction, I had explored the piano like a forest or a river - seeing how far I could go in a direction, exploring combinations of sounds, even crawling underneath the piano and daydreaming there. By contrast, the restrictions of my first formal lessons felt not only narrowing and diminishing, but arbitrary. These are the numbers for your fingers, and this black circle in this space here means this white key on the piano here.¹⁷⁸

Like Chenette's students, I had a mixture of off-putting early experiences with private music instruction. Suzuki violin, taught like a language, was great until I grew out of my violin and it wasn't replaced. The first piano teacher was dismissive of me because she thought I didn't have perfect pitch (I was still learning that notes have letters when she assessed me). The second

¹⁷⁸ Sarah LeMieux, "Everyone Should Feel Welcome," *Journal of the International Alliance for Women in Music* 26, no. 2 (2020): 23.

made me play through beginner books in order instead of letting me play the songs I liked to figure out by ear, and also made me pretend I was reading notation at the recital when I was playing from memory.

Education theorist Lia Laor calls this the *mechanistic* approach to pedagogy, “modeled itself after the inductivist scientific method, thereby aspiring to achieve the status of a science.”¹⁷⁹ He explains that “scientists as well as pedagogues of the time believed that the careful and patient collection of well-delineated facts leads to true theory, that true theory cannot be honestly achieved without hard work, and that any premature leap to conclusions is the source of all error rooted in the seduction of brittle hypotheses...likewise, mechanistic piano pedagogues invested much effort into identifying the essential parts comprising the musical piece to be performed and warned music students against the premature introduction of art into their studies. As a result, they ended up casting music itself out of piano lessons.”¹⁸⁰ This resonates both with my early experiences and the experiences of the students Chenette described above; this tension between artistic and scientific practices will be discussed fully in Chapter 4’s engagement with Artistic Practice as Research.

In school, there was an assortment of good and bad: the middle school music teacher who cast me in the musical and the other one who didn’t like my arrangements of popular songs because I had put them in easier keys to write out and simplified the rhythms. What I loved, and still love, about music was how it felt in and around my body; how I could let the vibrations of the piano trail off into infinity, how the guitar felt making sound physically connected to me. The

¹⁷⁹ Lia Laor, “In Music Nothing Is Worse Than Playing Wrong Notes: Nineteenth-Century Mechanistic Paradigm of Piano Pedagogy,” *Journal of Historical Research in Music Education* 38, no. 1 (2016): 9, <https://doi.org/10.1177/1536600616662540>.

¹⁸⁰ Laor, “In Music Nothing Is Worse Than Playing Wrong Notes,” 9.

only formal experience of music instruction that allowed me to focus on being immersed in feeling was singing in the school choir, which I loved. The places that I really got to learn what music could *do* for me were informal places: alone in my room, at a party with friends and guitars, or much later, at improvisational blues ‘jams.’ These were places where it was safe to fail and safe to laugh, and where the learning was casual, fun and self-paced, and full of humor and discovery.

Why do we teach it like this?

No teacher exists in a vacuum. Each has their own personality and preferences, but all of them became teachers in the context of the society we live in and the multiple, overlapping factors affecting music and education. Education reform efforts in the 1960s led to the distillation of subjects into purportedly logical elements to break down and teach. These elements will be very recognizable to any Western music teacher or student: rhythm, pitch, timbre, tempo, form and dynamics. Pitch is described as high vs. low; tempi are described as fast vs. slow. These can be useful categories for discussion and description, and even for composition. These categories are also limited in what information they can contain and convey, and dissecting music into these components can result in a loss of not only discovery or joy, but musical information.

Also, as a germane aside, unless people are taught to perceive music this way, they don’t necessarily do so. Researcher and educator Robert Cutietta developed a different schema for categorization with the intention of bringing music instruction back to a more human and

graspable place.¹⁸¹ By studying the perceptual responses of five hundred children to standardized pieces of music, Cutietta found that another potential schema for categorization could be “motion, energy, flow, fabric, and color.”¹⁸² In his 2022 article “Defying the Conventional,” Dillon Parmer discusses the functional benefit to singers of learning to perceive pitch in a way that is quite different from the conventional ideas of high and low; by learning to consider pitch *horizontally*, singers are able to perform more challenging passages with improved ease and strength.¹⁸³

Cutietta’s feeling was that the elements of music started as a way for people to be in community with each other and enjoy each other’s company, worship, or just experience beauty. By categorizing it in an ontological way, as education systems frequently do, we have made it seem like an inaccessibly complicated thing, not something for regular people. Moreover, reducing music to these categories leaves out significant musical information. As Cutietta explains, “Review of basal series, texts on the teaching of music, and even college-level music appreciation texts reveals an almost unquestioning acceptance of the teaching of music based on the sequential introduction of the basic elements of pitch, rhythm, form, dynamics, and timbre.”¹⁸⁴

The origin of this ontological categorization in the United States is the Manhattanville Music Curriculum, introduced to music educators in the late 1960s; the curriculum focused on

¹⁸¹ Robert A. Cutietta, “The Musical Elements: Who Said They’re Right?,” *Music Educators Journal* 79, no. 9 (1993): 50–52.

¹⁸² Cutietta, “Musical Elements,” 50.

¹⁸³ Dillon Parmer, “Defying the Conventional: Musical Performance, Embodied Cognition, and the Reconfiguration of Institutional Discourse,” *Music & Musical Performance: An International Journal* 1, no. 2 (November 2022): 3, <https://doi.org/10.34051/j/2026.17>.

¹⁸⁴ Cutietta, “Musical Elements,” 48.

what it deemed the most fundamental elements of the topic, and taught them in a “spiral” from simple to complex.¹⁸⁵ In Cutietta’s analysis, this creates a tension between the inherent creativity of music, and the analytical, logical nature of this type of formal study. Cutietta says, “Although the musical elements were originally devised for the purpose of creative activities such as making and composing music, breaking music into elements for study mandated a process that was analytic, logical, and highly dependent upon verbal labels. In contrast, the actual processing of music is largely holistic, intuitive, and nonverbal.”¹⁸⁶ Further, he notes the hypocrisy in positioning music as exceptional and special in the context of school curricula for its creative processing, but he says “by and large we negate the medium's inherent uniqueness by the way we teach it.”¹⁸⁷ Parmer notes that “the disciplinary discourses from which music researchers borrow their tools and methods for talking about music are rarely generated by those whose understanding is grounded in expert musical practice and whose professional interests further musical understanding.”¹⁸⁸

Compounding the effects of this historical and limiting taxonomy of music, in the United States, at this moment in time, most public school systems base their curricula on guidance taken from Common Core Standards. These standards describe what students should know and be able to do at each age and stage of education. Even in states that have not adopted the federal framework, there are state standards that more or less align with the federal ones. In the United States, education is funded by property taxes, and property values are connected to the

¹⁸⁵ Cutietta, “Musical Elements,” 49.

¹⁸⁶ Cutietta, “Musical Elements,” 48.

¹⁸⁷ Cutietta, “Musical Elements,” 50.

¹⁸⁸ Parmer, “Defying the Conventional,” 27.

perception of public school systems in a particular area. This reality contributes further to a system that incentivizes focusing on improving performance on standardized tests. Although music is not approached as a traditional academic subject in many schools, music educators have nonetheless gone with the tides and created standards for K-12 public music education. In part, this has been to attempt to maintain or justify funding arts education.

In 2002, American education was transformed by the passage of a law called the No Child Left Behind Act. Considered President George W. Bush's signature piece of legislation, this law, among other things, tied federal funding distribution to states to children's performance on standardized tests of reading and math.¹⁸⁹ Under his successor, President Barack Obama, the Center for Education Policy in Washington studied the outcomes of this law, and found that the attachment of financial punishments to educational outcomes caused distortions in curriculum and classroom practices.

Because the tests drive responses, the kinds of practices that teachers and administrators adopt in response to SBR tend to focus more on tested material and less on the untested content of the standards than would generally be desired. Excessive test preparation and other practices designed to raise test scores without promoting broader knowledge and understanding are another manifestation of this effect. One of the primary factors contributing to these distortions is the predictability of test content and format from one year to the next, a natural consequence of states' desires to adopt cost-effective measures that can be statistically linked to measure progress over time. led to tensions across levels of the system.¹⁹⁰

In an overview of the impacts of the 2002 law, Alyson Klein summed it up concisely. To put a fine point on it, "emphasis on math and reading tests has narrowed the curriculum, forcing

¹⁸⁹ Alyson Klein, "No Child Left Behind: An Overview," *Education Week*, April 10, 2015, <https://www.edweek.org/policy-politics/no-child-left-behind-an-overview/2015/04>.

¹⁹⁰ Laura S. Hamilton, Brian M. Stecher, and Kun Yuan, *Standards-Based Reform in the United States: History, Research, and Future Directions* (RAND Corporation, 2008), 5.

schools to spend less time on subjects that aren't explicitly tested, like social studies, foreign language, and the arts.”¹⁹¹

In 2021, the National Endowment of the Arts published the results of a survey, documenting a range of indicators that show declining arts access in the United States. “The National Endowment for the Arts’ Survey of Public Participation in the Arts (SPPA) found that after a steady trend of increased arts education in the twentieth century, access to arts education has been declining for the past three decades. Many attribute schools’ decreased emphasis on the arts to the increased focus on subjects measured for test based accountability.” ¹⁹²

Anecdotally, in my district, music programs are perennially on the chopping block in budget discussions. As part of this national push toward standards-based instruction, music and

2014 Music Standards (Composition/Theory)					
CREATING					
Imagine					
Generate musical ideas for various purposes and contexts.					
Common Anchor #1	Enduring Understanding: The creative ideas, concepts, and feelings that influence musicians’ work emerge from a variety of sources.			Essential Question: How do musicians generate creative ideas?	
	Novice	Intermediate	Proficient	Accomplished	Advanced
			MU:Cr1.1.C.1a Describe how sounds and short musical ideas can be used to represent personal experiences, moods , visual images, and/or storylines .	MU:Cr1.1.C.1a Describe and demonstrate how sounds and musical ideas can be used to represent sonic events , memories, visual images, concepts, texts, or storylines .	MU:Cr1.1.C.1a Describe and demonstrate multiple ways in which sounds and musical ideas can be used to represent extended sonic experiences or abstract ideas.
Plan and Make					
Select and develop musical ideas for defined purposes and contexts.					
Common Anchor #2	Enduring Understanding: Musicians’ creative choices are influenced by their expertise, context, and expressive intent.			Essential Question: How do musicians make creative decisions?	
	Novice	Intermediate	Proficient	Accomplished	Advanced
			MU:Cr2.1.C.1a Assemble and organize sounds or short musical ideas to create initial expressions of selected experiences, moods , images, or storylines .	MU:Cr2.1.C.1a Assemble and organize multiple sounds or musical ideas to create initial expressive statements of selected sonic events , memories, images, concepts, texts, or storylines .	MU:Cr2.1.C.1a Assemble and organize multiple sounds or extended musical ideas to create initial expressive statements of selected extended sonic experiences or abstract ideas.
			MU:Cr2.1.C.1b Identify and describe the development of sounds or short musical ideas in drafts of music within simple forms (such as one-part , cyclical , or binary).	MU:Cr2.1.C.1b Describe and explain the development of sounds and musical ideas in drafts of music within a variety of simple or moderately complex forms (such as binary , rondo , or ternary).	MU:Cr2.1.C.1b Analyze and demonstrate the development of sounds and extended musical ideas in drafts of music within a variety of moderately complex or complex forms .

National Core Arts Standards (2014) National Coalition for Arts Standards. Rights Administered by Young Audiences, Inc. New York, NY. All rights reserved. www.nationalartsstandards.org. Reproduced with permission.

arts educators participated in the creation and implementation of standards. As someone who has

¹⁹¹ Klein, “No Child Left Behind.”

¹⁹² American Academy of Arts and Sciences, *Art for Life’s Sake: The Case for Arts Education* (Cambridge, MA: American Academy of Arts and Sciences, 2021), 5.

myself participated in that process, I can speak to the good intentions that I brought to it. Even those good intentions could not erase the reality that the standards were at least in part generated to justify the existence of music education in budget ecosystems.

I wrote earlier about the type of child I was, and the hours I spent daydreaming underneath my piano. I invite the reader to imagine that child's response as you read the standards in the table on the previous page, from the National Association of Music Educators in 2014.¹⁹³

These are the standards for teaching *creativity*. While structure is a foundational part of creative acts, the process of presenting them in such a quantitative style creates a flavor of rigidity that feels at odds with a creative process that should be able to include failure, experimentation, and joy, even if this quantification is well-intentioned. I am reminded of the title of Kendrick Lamar's album, "To pimp a butterfly," nominated for 11 Grammy awards in 2015. Explaining the title in an oral history of the project, Lamar said "The title grasped the entire concept of the record. [I wanted to] break down the idea of being pimped in the industry, in the community and out of all the knowledge that you thought you had known..."¹⁹⁴ The idea of 'pimping,' or exploitation, although it might seem an extreme comparison, invites an interesting perspective on this ecosystem of music education today. The standards above essentially serve to redirect students' creative energy to suit purposes that benefit schools, rather than fostering their growth in whatever direction they might take unadulterated.

¹⁹³ National Core Arts Standards (2014) National Coalition for Arts Standards. Rights Administered by Young Audiences, Inc. New York, NY. All rights reserved. www.nationalartsstandards.org. Reproduced with permission.

¹⁹⁴ Andreas Hale, "'To Pimp A Butterfly': Kendrick Lamar Shares History," *GRAMMY.com*, May 15, 2017, <https://www.grammy.com/news/aoty-to-pimp-a-butterfly-oral-history>.

The standards are also limiting in what music they can describe and measure. To return to my own personal history as a creator of music, the first music I ever learned to compose was the blues. The blues is a genre that does not fit neatly into a specific major or minor tonality, but includes elements of both. The music I composed for this dissertation is electroacoustic. Frequently, tonality and meter are not sensible frames for assessing electroacoustic music. There are metrics and patterns by which you can evaluate these types of music, but I would likely fail if you were assessing my compositions based on the standards embedded in conventional music education.

As a positive aside, in Europe, a shift seems to have taken place in terms of an expansion of the criteria for evaluating successful music education. It is easy to see the difference in these standards when comparing the European Association for Music in Schools (EAS) teacher training outcomes document to the table above.¹⁹⁵ Students should be “able to manage and facilitate singing and other kinds of music making (with the voice, the body, instruments, technology and found sounds) with both groups and the whole class – using a variety of musical and non musical starting points and frameworks.”¹⁹⁶ Students should also be taught “different ways to listen and perceive music,” and be motivated to “explore and develop their own approaches to music;” equally important, students should learn “to share their musical experiences and to value the music they make and listen to.”¹⁹⁷

¹⁹⁵ Sarah Hennessy, Isolde Malmberg, Franz Niermann, and Adri de Vugt, “meNet and EAS Learning Outcomes: Music Teacher Training for Specialists and Generalists,” *EAS Learning Outcomes Platform* 259–281, accessed May 2, 2026, <https://eas-music.org/wp-content/uploads/2015/07/learning-outcomes-generalists-specialists1.pdf>.

¹⁹⁶ Hennessy et al., “meNet and EAS Learning Outcomes,” 262.

¹⁹⁷ Hennessy et al., “meNet and EAS Learning Outcomes,” 262.

Zooming out from the specific metrics and standards, it is one thing to discuss them in the abstract, and another to experience the realities of the classroom. In America, public school class sizes range from twenty on the smaller end to thirty-five on the larger. If a child's district offers music, then the child comes into a classroom likely governed by the standards discussed earlier. These constraints result in several circumstances that result in a further disconnection of students from musical agency. Musical forms are reduced to descriptive pieces of information to remember that can be tested. Even in classrooms that have more funding or latitude, there is often a performance focus, which not only leaves out students who might be quiet or rather not take the spotlight, but directs energy away from creation as a musical activity. Even in the best classroom, there is less room for choice, creation, and flow than would be ideal.

Musician Sammy Miller makes the connection between classroom priorities and the consequences to individual musical creativity in his article “We’re Teaching Music to Kids All Wrong.”¹⁹⁸ He says, “Educators lament that, as with other courses, band can frequently fall prey to “teaching to the test” — in this case, teaching to the holiday concert.”¹⁹⁹ This focus on performance for an audience leaves out students for whom that is not an interest or for whom that is an alarming prospect. Miller continues,

A class that by definition is meant to be a creative endeavor winds up emphasizing rigid reading and rote memorization, in service of a single performance... We need to abandon that approach and bring play back into the classroom by instructing students how to hear a melody on the radio and learn to play it back by ear, and encouraging students to write their own simple songs using a few chords. (The dirty secret of pop music, as Ed Sheeran has explained, is that most chart-topping songs can be played by using only four chords:

¹⁹⁸ Sammy Miller, “We’re Teaching Music to Kids All Wrong,” *New York Times*, September 23, 2023, <https://www.nytimes.com/2023/09/23/opinion/teach-music-better.html>.

¹⁹⁹ Miller, “We’re Teaching Music to Kids All Wrong.”

G, C, D and E minor.) So start with just one chord, a funky beat and let it rip — and, voilà, you’re making music.²⁰⁰

I wrote in Chapter 2 of the power of music as a tool for self-efficacy in mothers, and about the patterns of neural activation that accompany music making. The power of music to help people improve their experiences of life is also partially held in these unique and natural human musical circumstances that conventional instruction de-prioritizes. As we learned previously, music immersively activates the whole brain, can be a powerful antidote to isolation by creating community and a sense of shared experience, and creates beauty that elevates the human experience.

Educational psychologist and researcher Mihaly Csikszentmihalyi described the problem as follows:

This perspective immediately makes clear why schools and creativity are inimical. In a creative process, the point is to innovate on the content of the domain in such a way that the field will deem the innovation better than what existed before. But in schools, the point is for the students to replicate the content of the domain as closely as possible, without deviations. The teachers’ task is to ensure conformity with prior knowledge, without even trying to evaluate whether the students’ deviations might be ‘better’ than what is written in the textbooks. Thus the main task of schools is to transmit knowledge with as little change as possible —a necessary task which many might argue should not be tampered with.²⁰¹

While I agree with Csikszentmihalyi’s basic analysis, I disagree with his bounding of creativity as requiring innovation. Returning to Chenette, he says: “Both novelty and value/

²⁰⁰ Miller, “We’re Teaching Music to Kids All Wrong.”

²⁰¹ Mihaly Csikszentmihalyi and Rustin Wolfe, “New Conceptions and Research Approaches to Creativity: Implications of a Systems Perspective for Creativity in Education,” in *The Systems Model of Creativity: The Collected Works of Mihaly Csikszentmihalyi*, ed. Mihaly Csikszentmihalyi (Dordrecht: Springer, 2014), 168–169, https://doi.org/10.1007/978-94-017-9085-7_10.

appropriateness can also be judged on multiple levels: an idea may be novel and valuable within a single person's experience, or it may be novel and valuable to society as a whole. The former is sometimes called "little-c creativity," and the latter "big-C Creativity." He goes on to say that "In our teaching, we are most likely to focus on the former, though at least in part because it may lead to the latter."²⁰² Focusing on the benefit of music to the person making it in the way that we teach it can increase that benefit. As discussed in Chapter 2, research demonstrates that for the particular population under discussion in this piece of writing, namely mothers with PPD, the act of creating music can have many benefits to the creator, whether or not the music is innovative.

As we can see, a multiplicity of economic, social, cultural and other factors are at play in the current and past realities of music education and the resultant self-limiting beliefs relative to musical competency in people who have studied music in these contexts. While I am of the opinion that critique without suggestions for improvement is generally unhelpful, many of these factors, like educational funding, are too large to be under our control as individual practitioners or teachers of music. However, the way that we talk about talent and creativity relative to music is something that each of us can maintain in our active awareness in the service of creating better outcomes. I will discuss what I consider to be healthy and functional for the pedagogy of music and creativity in Chapter 6. My pedagogy developed over time, and is rooted in artistic research that is inextricable from my experiences as a student, composer, musician, mother and pedagogue. I have discussed some of my early experiences in this chapter; the following chapter will discuss the foundations of Artistic Practice as Research and how contextualizing my early

²⁰² Chenette, "Creativity in the College Music Classroom."

experiences as a composer in this domain allowed me to use the knowledge they generated to construct further inquiry.

Chapter 4: The Long Arc of Artistic Practice as Research

Chapter Introduction

In retrospect, and upon engaging with the theoretical frameworks in the domain, I view my experimentation and development as a composer beginning twenty-one years ago as a form of Artistic Practice as Research (APAR). By creating music in order to process and regulate my emotional experience, I was iterating and testing the hypothesis that it would do so, as well as refining my ability to create. This research informed the development of my own art and pedagogy, and created the foundations of what would become my study design.

APAR is a relatively new and evolving field that attempts to both define and explain how works of art, including visual art, dance, design, music, and other evolving disciplines, can constitute research. Like many of the systems and fields discussed in this dissertation, APAR is multifactorial, and situating my work within it requires both a review of the field itself, and an explanation of the terms. Following a general overview of the development and refinement of the idea of APAR as its own type of practice-based research in academic society, I will examine several models and analyses of the field, including researcher Christopher Frayling's categories and concept of research into, for and through art,²⁰³ the writing of Dutch music researcher Henk Borgdorff,²⁰⁴ Darla Crispin's Artistic Practice as Input and Output,²⁰⁵ Crispin's collaborative

²⁰³ Frayling, *Research in Art and Design*.

²⁰⁴ Borgdorff, *The Debate on Research in the Arts*.

²⁰⁵ Crispin, "Artistic Research and Music Scholarship."

work with Kathleen Coessens and Anne Douglas,²⁰⁶ and Sophie Stévanice and Serge Lacasse's research-creation.²⁰⁷

To both ground my work in this domain and contribute to the ongoing discussion of what it means for art to be research, I will start by making this statement: beginning approximately twenty-one years ago, I researched, attempted and completed musical works, and revised and iterated the works based on their effectiveness to me, all with the — sometimes explicit and sometimes implicit — goal of processing emotions and alleviating symptoms of depression. More specifically, I used lyrical elements like metaphor and symbolism, musical elements like tonality, modality and prosody, and acoustic elements like timbre and embodied aural experience of myself as a listener to process, contextualize, and create value out of my subjective experience as a mother with postpartum depression. I engaged in both traditional academic research to improve my practice as a composer and pedagogue, and nontraditional research outside the boundaries of institutions, in order to move towards this research goal. This research eventually resulted in the music creation pedagogy I used in my case study, described in Chapter 6.

To further expand my inquiry for the purposes of this dissertation, I used the music creation pedagogy I developed to compose a new piece of music about my past experiences with postpartum depression, taking artifacts from my early motherhood as source material to create new artistic research. This compositional process was a form of inquiry that generated both knowledge about my experiences, and a way to communicate that knowledge to other people as listeners. As this chapter will discuss, and Chapter 7 will demonstrate, art (in this case, music) is

²⁰⁶ Coessens et al, *The Artistic Turn*.

²⁰⁷ Stévanice and Lacasse, *Research-Creation in Music and the Arts*.

able to discover and communicate different types and points of knowledge than more linear, traditionally academic modes of communication.

In their book “The Artistic Turn: A Manifesto,” authors Coessens, Crispin, and Douglas articulate this feature of knowledge, as both a benefit and limitation of scientific modes of inquiry, thought and communication, and a benefit and limitation of artistic research. They describe scientific research as resulting in “... the simplification or reduction of phenomena and processes which we undertake in our encounters with them,” going on to say that “The positive aspect of this approach is the way that it permits the discovery of relations, features, processes, laws whose knowledge enhances human life.” They continue: “But there is a negative aspect... The progress of scientific ideas clarifies but leaves behind a certain richness of experience, of variety and idiosyncrasy.”²⁰⁸ Later they phrase it more simply: “Clearly, there is a problem: human life seems to have become divided up by science into ‘chunks’ or quanta of activity. Yet, in reality, all of these events which form the experience of ‘my visit to the supermarket’ function as a blended narrative of my existence.”²⁰⁹

By choosing an interdisciplinary method of both research into and communication about music as a therapeutic approach for postpartum depression and engaging in several modes of inquiry and means of communication, I hope to discover and communicate a fuller and more whole picture than I would by using the tools of a solitary discipline; to take the ‘quanta’ of this phenomenon and blend them into a work that contains more information than the sum of its parts.

²⁰⁸ Coessens et al, *The Artistic Turn*, 23.

²⁰⁹ Coessens et al, *The Artistic Turn*, 51.

What is research?

To understand how art can function as research, there are questions that must be considered. First, what precisely is research, and how can artistic practice be part of it? How has the common imagination of what research is contributed to whether or not artistic practice is considered research? Much like the popular idea of creativity discussed in Chapter 3, it is my view that the popular *idea* of research is a romanticization that somewhat obscures the nature of research itself. In the common imagination, the word evokes mental images of lab coats and smoking beakers, or studious people scribbling notes in dimly lit libraries, late at night, towering stacks of books next to yellow legal pads and open laptops.

Sir Christopher Frayling is a renowned scholar of popular culture and founding professor of cultural history at London's Royal College of Art in 1979.²¹⁰ His 1993 paper "Research in Art and Design" is foundational to the discussion of APAR; in fact, it is referenced in almost every other article or work cited in this chapter. His description of the popular idea of research presages my own. He describes "obscure corners of specialised [sic] libraries, where solitary scholars live; white-coated people in laboratories, doing esoteric things with test-tubes."²¹¹ Frayling's prose and approach are also refreshingly human and down-to-Earth, especially if someone is swimming in a sea of verbose research literature. This is not only pleasant but good strategy: as

²¹⁰ Jonathan Jones, "The Guardian Profile: Sir Christopher Frayling," *The Guardian*, December 12, 2003, <https://www.theguardian.com/artanddesign/2003/dec/12/artspolicy.artsfunding>.

²¹¹ Frayling, *Research in Art and Design*, 4.

we will see, a commonly accepted feature of research is that it should be communicated to the wider world.²¹²

As with most terms, there are a range of accepted definitions for the word ‘research,’ and it’s possible to get so far into the details of it that you end up with *ad absurdum* conclusions like ‘everything is research,’ or ‘nothing is research.’ Unfortunately, both of these turn out to be defensible statements, so more clarity is required. A toddler throwing a spoon on the floor can be said to be doing research, with a simple but important research question: what will mom do? To move us forward in this discussion and support the situation of my own work in the field of APAR, I will begin by putting a few definitions of research in conversation with one another, although I am certainly not the first to do so. Frayling constructs his seminal taxonomy of artistic research categories by engaging in a similar exercise, and I will return to it.

The Office of Research Integrity in the United States Department of Health and Human Services says that “Research is a process to discover new knowledge.”²¹³ It goes on to describe the process as “A systematic investigation (i.e., the gathering and analysis of information) designed to develop or contribute to generalizable knowledge.”²¹⁴ The National Academy of Sciences states that the object of research is to “extend human knowledge of the physical, biological, or social world beyond what is already known.”²¹⁵ According to the NAS, *scientific*

²¹² Hampshire College, “What Is Research?,” accessed January 10, 2026, <https://www.hampshire.edu/offices/office-dean-faculty/irb-research-human-subjects/irb-general-information/what-research>.

²¹³ U.S. Department of Health and Human Services, Office of Research Integrity, “Definitions,” *ORI Introduction to RCR: Chapter 3. The Protection of Human Subjects*, accessed January 10, 2026, <https://ori.hhs.gov/content/chapter-3-The-Protection-of-Human-Subjects-Definitions>.

²¹⁴ Office of Research Integrity, “Definitions.”

²¹⁵ U.S. Department of Health and Human Services, Office of Research Integrity, “Module 1: Introduction: What Is Research?,” accessed January 10, 2026, <https://ori.hhs.gov/module-1-introduction-what-research>.

research is considered different than other forms of acquiring knowledge, for example reading, because it uses the systematic process known as the Scientific Method.

The Scientific Method consists of observing the world around you and creating a hypothesis...an informed and educated prediction or explanation about something... testing the hypothesis, and then examining the results of these tests as they relate to both the hypothesis and the world around you.²¹⁶

Hampshire College, another research institution in the United States, expands the purpose of research to include the following, saying research is done to:

Evaluate the validity of a hypothesis or an interpretive framework.
To assemble a body of substantive knowledge and findings for sharing them in appropriate manners.
To help generate questions for further inquiries.²¹⁷

To this point, Frayling begins his 1994 paper by noting that “There seem to be almost as many definitions of research flying around in higher education right now, as there are reasons for promoting them.”²¹⁸ His definition begins with an exploration of the first recorded usages of the word in 1577, and the Oxford English Dictionary definition, separating the idea of research into little r and Big R. “Research with a little r - meaning 'the act of searching, closely or carefully, for or after a specified thing or person,’” and research with a big R defined as “work directed towards the innovation, introduction, and improvement of products and processes.”²¹⁹ Academic research falls into the latter category.

²¹⁶ U.S. Department of Health and Human Services, Office of Research Integrity, “What Is Research?,” accessed January 10, 2026, <https://ori.hhs.gov/education/products/sdsu/research.htm>.

²¹⁷ Hampshire College, “What Is Research?,” accessed January 10, 2026, <https://www.hampshire.edu/offices/office-dean-faculty/irb-research-human-subjects/irb-general-information/what-research>.

²¹⁸ Frayling, *Research in Art and Design*, 4.

²¹⁹ Frayling, *Research in Art and Design*, 4.

In Europe, beginning in 1988, the Research Assessment Exercise met every five years to discuss a definition of what constituted quality research, and was eventually replaced in 2014 by the Research Excellence Framework.²²⁰ The RAE created a rubric for assessing research, which centers the *contributions* of the research: “Four star Exceptional: Ground-breaking or transformative impacts of major value or significance, with wide-ranging relevance have been demonstrated. Three star Excellent: Highly significant or innovative (but not quite groundbreaking) impacts relevant to several situations have been demonstrated,” and so on.”²²¹

To summarize and simplify, all these definitions of research seem to agree that research is the act of seeking out knowledge in order to form or test a hypothesis about something. Ideally, the research should attempt to progress or improve something for humanity in general. Lastly, for research to be considered to be of good quality, the results need to be repeatable or generalizable and communicated to others. Returning to the imaginary toddler, her hypothesis, based on previous experiments, might be that mom will get upset if she throws the spoon on the floor. However, in order to assemble her body of knowledge, she must repeat her experiment enough times such that she can generalize from the results. Let’s imagine she can communicate her results to her friends at playgroup. This could be considered to be of high-value impact to her friends, if they accept her results. As far as generating questions for further inquiry, my observations of my own toddlers included watching them iterate and test these sorts of

²²⁰ Keith Webster, “The Evolving Role of Libraries in the Scholarly Ecosystem,” in *Academic and Professional Publishing*, ed. Robert Campbell, Ed Pentz, and Ian Borthwick (Chandos Publishing, 2012), 315–336, <https://doi.org/10.1016/B978-1-84334-669-2.50013-5>.

²²¹ Higher Education Funding Council for England, Research Excellence Framework Impact Pilot Exercise: Guidance to Expert Panels (HEFCE, March 30, 2010), 7, https://2014.ref.ac.uk/media/ref/content/background/impact/guidance_panels.pdf

hypotheses situationally: will mom get mad if I throw the spoon on the floor at a restaurant?

What about at the doctor's office?

The Neurological Underpinnings of the Research Impulse

An imaginary toddler may seem like a slightly silly example with which to frame a serious discussion, but I include it as a lighthearted demonstration of what I consider to be the ubiquity of research behaviors in human beings. Turning to neurology, I use the example of the toddler to illustrate the idea that the primary purpose of the human brain is to gather data, test hypotheses and make predictions in the service of keeping ourselves alive. This is called the Prediction Machine theory of the brain, articulated by Dr. Amil Seth.

The essence of the PM view is that the brain is continually engaged in formulating predictions, or hypotheses, about the causes of its sensory inputs, and in testing these predictions against incoming streams of sensory signals—thereby shaping perceptual content, guiding action, and driving learning. On most interpretations, the brain accomplishes this by implementing some approximate form of Bayesian inference, wherein sensory signals are combined with ‘prior’ expectations or beliefs, to form ‘posterior’ representations.²²²

We may not always come to accurate conclusions, limited as individuals are by our sense organs and cognitive faculties, but if we extrapolate from this view, the Scientific Method is functionally embedded in our development as children. Whether we are aware of it or not, most of us are consistently engaging in activities and processes to discover and test the validity of new knowledge. This is an essential neurological feature of humans. An awareness of the PM theory could frame the social and cultural process of defining what constitutes quality research almost

²²² Anil K. Seth, “Preface: The Brain as a Prediction Machine,” in *The Philosophy and Science of Predictive Processing*, ed. Dina Mendonça, Manuel Curado, and Steven S. Gouveia (Bloomsbury Academic, 2020), i.

as an ongoing codification of an essential human neurological process. This is relevant to a discussion of Artistic Practice as Research, because it allows us to consider research as innately emerging from human activity, as opposed to a completely separate activity unto itself.

The Culture of Research

The second piece of the Hampshire definition, which is also included in the Research Assessment Exercise referenced above is, to paraphrase, assembling a body of knowledge and sharing it appropriately. This has arguably been the central function of higher academia since it has existed. As such, a *culture* of research has developed, driven by people working in academic domains and disciplines, and it is from this culture that we absorb the ideas of what research is, and crucially for this discussion, should *look like*. Returning to Frayling's articulation of research in the popular imagination, this culture is where we get the white lab coats and test tubes; the towering stack of books in the library. This is also where we get the guidelines for participation in this culture of research, for example, the necessity to publish articles, the types of research that are funded, the subjects that are perceived as serious.

This culture of research has created an interesting tension around the idea of other subjects *vis-à-vis* research, particularly subjects that are not traditionally viewed as academic or scientific, e.g. the arts. Coessens, Crispin and Douglas note that “a second fragility of science is embedded in [these] cultural ways of being: Western scientific ideas, like any modes of thought, are susceptible to our constantly developing worldviews and our periodic transformation of them into fresh worldviews.”²²³ To say this another way, a lack of self-awareness in the culture of

²²³ Coessens et al, *The Artistic Turn*, 41.

research and science may obscure knowledge that can be illuminated through other disciplines.

Artist, pedagogue and scholar Dillon Parmer describes this phenomenon as it relates to music specifically:

...research-based discourse—whether it derives from scientific, humanistic, or socio-scientific disciplines does not matter—rules over all other forms of discourse and human activity... We see this rule play out in music curricula structures when student musicians are subjected to disciplinary rule in its various guises from day one of any program of music study. Whether those guises be conventional music theory or history, or other brands of academic study, like critical or cultural, literary or linguistic, structuralist or post-structuralist, psychoanalytic or semiological, phenomenological or ecological, student musicians are expected to defer to all of these discourses lest their experience of music remains uninformed, lest what they have to say remains undisciplined.”²²⁴

This creates a challenge in bringing the knowledge that the arts and artists can relay into the circle of what is considered worthy of study. In the specific realm which considers how the arts and artistic practice might constitute research, there has been an evolving twenty-plus year polite argument about how to define it. Beginning in Europe in the late 1990's and early 2000's, waves of educational reform spurred by the birth of the European Union resulted in the Bologna Declaration in 1999, and the following Bologna Process.²²⁵ This was, and continues to be, an ongoing Europe-wide redesign attempt of the entire higher education system. On the heels of these events, in 1996, officials in the United Kingdom appointed Chairman Ron Dearing to create a body that would investigate their higher education system for the purpose of reform. This committee generated the Dearing Report, which proposed a twenty-year roadmap for higher education, including ninety-three recommendations; one of these was that a new Arts and

²²⁴ Parmer, “Defying the Conventional,” 27.

²²⁵ Borgdorff, *Debate on Research in the Arts*, 5.

Humanities Research Council be immediately established to both fund and promote research in the arts and humanities at the same level as in STEM disciplines.²²⁶

Research and/through/into/for Art(s)

It was during this cultural moment that Frayling wrote the widely-referenced paper mentioned earlier in the chapter. Discussing the conflict between the popular conception of art and artists, and the popular conception of research, Frayling concludes “that artists have worked just as often in the cognitive idiom as the expressive; that some art counts as research - anyone's definition; that some art doesn't.”²²⁷ Frayling goes on to describe three potential categories for artistic research which I will describe below: research into art, research through art, and research for art.

Research *into* art is the most straightforward, and includes activities like historical research and theoretical perspectives on art and design.²²⁸ Research *through* art can involve things like new materials, creating or adapting technology to do something new in art, or what he terms “action research,” where the artist experiments in the studio, keeps a record of the results, and communicates them.²²⁹ In the context of music, this could be something like Pierre Schaeffer's early experiments in search of a *musique concrète* and his accompanying writings,²³⁰

²²⁶ James Herbert, “Back on to the Agenda,” in *Creating the AHRC: An Arts and Humanities Research Council for the United Kingdom in the Twenty-First Century* (British Academy, 2008), 8–14, <https://doi.org/10.5871/bacad/9780197264294.003.0002>.

²²⁷ Frayling, *Research in Art and Design*, 7.

²²⁸ Frayling, *Research in Art and Design*, 5.

²²⁹ Frayling, *Research in Art and Design*, 5.

²³⁰ Pierre Schaeffer, *À la recherche d'une musique concrète* (Paris: Éditions du Seuil, 1952).

or Steve Reich's explanations of his process experiments with magnetic tape.²³¹ The last category, research *for* art and design, Frayling calls "thorny," possibly because in his writing, it is the most speculative of the three: "Research where the end product is an artefact - where the thinking is, so to speak, embodied in the artefact, where the goal is not primarily communicable knowledge in the sense of verbal communication, but in the sense of visual or iconic or imagistic communication."²³² Here Frayling expresses the need for a category where the research is the art product itself, but without offering a concrete idea of what that could look like, whereas the other two categories have many real-life examples to support them. Later researchers successfully expanded on this category, as I will discuss below.

In a series of lectures and presentations on research in the arts in 2005, Dutch music scholar Henk Borgdorff put Frayling's categories into conversation with definitions of artistic research devised by the Arts and Humanities Research Council and the Research Assessment Exercise, both mentioned earlier. Attributing what he perceived as the urgency of the conversation to the educational reforms of the time, Borgdorff focused first on articulating the questions to be answered, saying "the issue is whether this type of research distinguishes itself from other research in terms of the nature of its research object (an ontological question), in terms of the knowledge it holds (an epistemological question) and in terms of the working methods that are appropriate to it (a methodological question)."²³³ Borgdorff also identifies the question of whether artistic research fits naturally into the ecosystem and culture of higher education. As I expressed earlier in the chapter, Borgdorff essentializes research as a core human

²³¹ Steve Reich and Paul Hillier. *Writings on Music*, 1965-2000. Oxford University Press, 2002.

²³² Frayling, *Research in Art and Design*, 5.

²³³ Borgdorff, *Debate on Research in the Arts*, 1.

function, rhetorically asking “Doesn’t all art practice count as research to some extent?”²³⁴

However, his definition differs from mine, in that he believes that Artistic Research must have been *intended as such* from the outset. Through his dissection of the Research Assessment Exercise definition, he derives the conclusion that in artistic research, “The investigation should be intended as research.”²³⁵ This section of the chapter began with a discussion of the PM theory to build an opposing assertion; that it is possible for research to be intrinsic to an activity, and so it does not have to have been intended as such from the outset. I think it is possible to consider something research in retrospect, or to identify research behaviors in activities that were not consciously intended as such, e.g., the toddler with the spoon. I will discuss this further in the following section.

Royal Conservatory of Scotland researchers Celia Duffy and Stephen Broad use Borgdorff’s analysis as a jumping-off point to discuss the various ways in which Artistic Practice as Research in music both does and does not fit into either the traditional culture of research of the university, or into the traditional music conservatoire.²³⁶ In their chapter “Practising Research, Playing With Knowledge,” they describe what can be called a cultural tension, asking “how do we square notions of practice as research and ‘high art’ with colleagues who identify themselves as entertainers?”²³⁷ They describe the conservatoire as a more traditionally vocational, rather than academic, institution, and even go on to say that “among some

²³⁴ Borgdorff, *Debate on Research in the Arts*, 3.

²³⁵ Borgdorff, *Debate on Research in the Arts*, 9.

²³⁶ Celia Duffy and Stephen Broad, “Practising Research, Playing with Knowledge,” in *Artistic Practice as Research in Music: Theory, Criticism, Practice*, ed. Mine Doğanatan-Dack (Farnham: Ashgate, 2015), 33–52.

²³⁷ Duffy and Broad, “Practising Research,” 34.

conservatoire students and staff, the word ‘academic’ is a loaded or even pejorative term.”²³⁸ In interviewing identified artist-researchers at the Royal Conservatoire about this definition, they found many outright rejected the label ‘academic.’²³⁹ Because artistic practice doesn’t look like research from the culture of university research, it has a tougher time being both accepted and defined.

Duffy and Broad also attempt to articulate what differentiates Artistic Practice as Research from just artistic practice. Among many factors, they too single out intentionality. “In the discourse around the nature of practice as research, the intentional nature of the investigation is one of the factors that has been proposed as a requisite feature of such research.”²⁴⁰ Duffy and Broad begin their construction of a definition by quoting Borgdorff, who says that an artistic practice can qualify as research when its “purpose is to broaden our knowledge and understanding through an original investigation.”²⁴¹

As is so often the case in any field of study involving theory, their mention of Borgdorff led me down a rabbit hole of politely competing taxonomies and thoughtfully worded definitions that disagreed on one point or another. In fact, Borgdorff even disagrees slightly with himself, or to put it a different way, leaves room for divergent interpretations within his definition of artistic practice as research. In his own discussion of the discussion, as it were, Borgdorff says, “The first thing worth noting about the debate is that many of the contending parties tend to opt for the rhetorical force of knowing you are right above the gentle power of convincing arguments. It is

²³⁸ Duffy and Broad, “Practising Research,” 35.

²³⁹ Duffy and Broad, “Practising Research,” 41.

²⁴⁰ Duffy and Broad, “Practising Research,” 45.

²⁴¹ Duffy and Broad, “Practising Research,” 45.

not entirely coincidental that people's personal opinions usually correlate with their own affiliations."²⁴² I bring this up to cue the reader that in the evolving discourse around APAR, it is possible to see the fluidity and development of a discipline almost in real time. To summarize, most models agree on divisions between research on how to do art, research that is art itself, and research about features or qualities of art. There is disagreement about the question of intention, and whether research must have been intended to be so from the outset, or whether it can be retroactively determined that it meets the definition.

Purpose vs. Intention

To contribute to the discourse, I would like to define the distinction between purpose and intention. Although those terms are used interchangeably in Borgdorff's articulation of the nature of Artistic Practice as Research, and Duffy and Broad's subsequent reconceiving, they do not mean precisely the same thing. It is important that this distinction be made in order to derive knowledge from artistic research retrospectively, as is commonly done in autoethnography.

I will explain my reasoning as follows.

Human beings frequently engage in activities that have a significant or meaningful purpose, even when our intentions as we might articulate them are not actually that purpose. For example, as mentioned previously in this chapter, the primary purpose of the human brain is to gather and assess data to keep the human alive. That is to say, it is commonly understood that many of our behaviors as humans are related to our survival needs, and are products of evolutionary adaptation. Consider that fight, flight, freeze or fawn behaviors often manifest, for

²⁴² Borgdorff, *Debate on Research in the Arts*, 2.

example, in the workplace or a social situation in which we are not in any real physical danger.²⁴³ The purpose of these behaviors, from an evolutionary standpoint, is to keep us alive, even if we might not be able to even precisely identify our intentions in the moments of enacting them. The neurology of this phenomenon as regards human decision-making is quite interesting, and bears on the siting of work in the context of artistic practice as research.

In a much-referenced 1983 study, researcher Benjamin Libet devised a method to study the brain activity associated with purely voluntary acts.²⁴⁴ His experimental design compared the ‘clock time’ of a person’s conscious decision to move their wrist with the electrical activity in their brain as measured by EKG. There were no external cues for the subjects to move and they were directed to do it at will, whenever they felt like it was the right time. Over a series of forty trials, the average of their *readiness potential* (a measurement of neuronal activity in the motor cortex that precedes conscious action)²⁴⁵ was 550 milliseconds before they reported the time at which they had made their decisions.²⁴⁶ To grossly oversimplify the results, they suggest that the body and the ‘back brain’ make the decision before the conscious ‘you’ part of the brain knows that you’ve made it.

Likely because this study created an interesting tension around the subject of human free will, there have been significant close readings and other possible explanations offered, including the time-cost of switching tasks from thinking of taking an action and checking the time, to

²⁴³ Vicki Webster, Paula Brough, and Kathleen Daly, “Fight, Flight or Freeze: Common Responses for Follower Coping with Toxic Leadership,” *Stress and Health* 32, no. 4 (2016): 346–54. <https://doi.org/10.1002/smi.2626>.

²⁴⁴ Benjamin Libet, Curtis A. Gleason, Elwood W. Wright, and Dennis K. Pearl, “Time of Conscious Intention to Act in Relation to Onset of Cerebral Activity (Readiness-Potential): The Unconscious Initiation of a Freely Voluntary Act,” *Brain* 106, no. 3 (1983): 623–642, <https://doi.org/10.1093/brain/106.3.623>.

²⁴⁵ Aaron Schurger, Pengbo “Ben” Hu, Joanna Pak, and Adina L. Roskies, “What Is the Readiness Potential?,” *Trends in Cognitive Sciences* 25, no. 7 (2021): 558–570, <https://doi.org/10.1016/j.tics.2021.04.001>

²⁴⁶ Libet et al., “Time of Conscious Intention to Act,” 635.

performing the movement itself.²⁴⁷ Still, subsequent research conducted as neuroimaging technologies advanced have added to this study the knowledge of *bidirectional* connections in the brain between the prefrontal cortex, commonly thought of as the decision engine of the brain, and areas associated with sensory processing, including the amygdala,²⁴⁸ (extensively discussed in Chapter 1). The inter-functioning of these neurological systems and structures seems to be deeply important to human behavior, identity, experience, and decision-making, i.e., the bases and motivations of our decisions to take or not take any particular action are not always in our conscious awareness.

Returning to the concept of Artistic Practice as Research, I bring up this issue of neurological activity and the concept of conscious action to support the proposition that although I was not consistently aware of doing Capital-R Research through my artistic practice when I was experiencing postpartum depression, in retrospect, it is quite clear that I was engaging in research behaviors: experimentation, measuring results, and using that feedback to inform my next steps. My goal was to feel whole and human again. My hypothesis was that music would help achieve this goal. To frame it in Borgdorff's terms and illuminate the reason for my having made the distinction, although that may not have been my *intention*, it was clearly my *purpose*. To further build out this understanding of my artistic practice as a postpartum mother as research,

²⁴⁷ Schurger et al., "What Is the Readiness Potential?," 559.

²⁴⁸ Rita F. de Oliveira, Lysann Damisch, Ernst-Joachim Hossner, Raoul R. D. Oudejans, Markus Raab, Kirsten G. Volz, and A. Mark Williams, "The Bidirectional Links between Decision Making, Perception, and Action," in *Mind and Motion: The Bidirectional Link between Thought and Action*, ed. Markus Raab, Joseph G. Johnson, and Hauke R. Heekeren, *Progress in Brain Research* 174 (Elsevier, 2009), 85–93, [https://doi.org/10.1016/S0079-6123\(09\)01308-9](https://doi.org/10.1016/S0079-6123(09)01308-9)

Robert M. Sapolsky, *Behave: The Biology of Humans at Our Best and Worst* (Penguin Press, 2017), 62.

we can include the frame of artistic practice as *input*, a concept proposed by researcher Darla Crispin, and expand the time-scale of my research to the present day.

In her chapter “Artistic Research and Music Scholarship,” both building off of and deviating from Borgdorff and Frayling’s definitions and categories, Crispin proposes three interrelated models to describe musical practice as artistic research in context.²⁴⁹ Like Borgdorff, Crispin uses Frayling’s division of artistic research into, through and for art and design as a jumping-off point for the development of a new model, almost a gradient between musical practice and research in-and-through musical practice. Crispin describes this gradient, saying “the apparently hard boundaries between the categories of this diagram disguise what is in reality a seamless continuum across which certain predominant characteristics emerge at particular points, in the manner of formants in a sound spectrum.”²⁵⁰

She does still separate the gradient into three divisions. These are Artistic Practice as Input, Artistic Practice as Process, and Artistic Practice as Output, roughly analogous to Frayling’s categories. These models are very straightforward. In the first category (Artistic Practice as Input) the process of creating is input into the research, meaning that the artistic work is analyzed and measured for data after its creation, much like Frayling’s research into art.²⁵¹ The second (Artistic Practice as Process) involves activities like researching, investigating and attempting new techniques for performance, practice or composition and communicating the results, like Frayling’s research through art. The third category (Artistic Practice as Output), she

²⁴⁹ Darla Crispin, “Artistic Research and Music Scholarship: Musings and Models from a Continental European Perspective,” in *Artistic Practice as Research in Music: Theory, Criticism, Practice*, ed. Mine Doğantan-Dack (Farnham: Ashgate, 2015).

²⁵⁰ Crispin, “Artistic Research and Music Scholarship,” 58.

²⁵¹ Crispin, “Artistic Research and Music Scholarship,” 60.

calls the most controversial, and it is the one in which the artistic work itself is the means of communicating the research findings.²⁵²

Crispin says that “in principle,” the product of Artistic Research can be artistic practice alone, and that it “may be supported by verbal explanations, but it is axiomatic that it should not have to rely exclusively upon these.”²⁵³ In Crispin’s work with Coessens and Douglas, they use the word *tacit*²⁵⁴ to describe the kind of knowledge that art encodes and generate and communicate. I think the word *embodied* also describes artistic knowledge and understanding that can be perceived through our sensory apparatus and our incarnate-ness as human beings, and both they and Parmer use this word to describe the knowledge that art can create.²⁵⁵ In her further discussion of this model, Crispin articulates the expectation that the artist-researcher “will still be engaged in high-level professional practice in the public domain,”²⁵⁶ and that the quality of the resulting artistic work plays a role in evaluating the quality of the research. Both my artistic work and this dissertation can be situated within this model. I satisfy the first criteria, and I will explain how my work creates and communicates specific knowledge to satisfy the second criteria towards the end of this chapter.

Crispin proposed her models in response to what she calls the “problematic” aspects of APAR: the dual role of the artist as both participant and observer in their research, as well as what she calls “cognitive subjectivity,” defined as the necessity that artist researcher be able to

²⁵² Crispin, “Artistic Research and Music Scholarship,” 61.

²⁵³ Crispin, “Artistic Research and Music Scholarship,” 61.

²⁵⁴ Coessens et al, “The Artistic Turn,” 7.

²⁵⁵ Coessens et al, “The Artistic Turn,” 22.

Parmer, “Defying the Conventional,” 3.

²⁵⁶ Crispin, “Artistic Research and Music Scholarship,” 61.

both understand and communicate their work in terms beyond their own personal experience.

Crispin states that “the unique attributes of the artist-researcher, especially as they are articulated within their artistic practice, are not to be excluded from the research process but, on the contrary, form a vital touchstone for testing and evaluating the evidence generated by that process.”²⁵⁷ I would go further and say that self-awareness of ‘cognitive subjectivity’ should be welcome in any research field. As human beings, we are by nature subjective, and this subjectivity is present in all human domains, even in the proverbial ‘ivory tower’ of traditional academic research. Coessens, Crispin and Douglas agree: “scientific ideas, like any modes of thought, are susceptible to our constantly developing worldviews and our periodic transformation of them into fresh worldviews.”²⁵⁸ Bringing subjectivity into the foreground, as Artistic Practice has been obligated to do, allows us to examine it as part of the knowledge generated: “...we can only understand the world from the perspective of our natures as embodied, perceptual and cognitive beings of a special kind: thinking the world through human transformational practices and translations which originate in our specific way of experiencing the world.”²⁵⁹

In her 2018 book co-authored with Serge Lacasse, *Research-Creation in Music and the Arts*, Sophie Stévanec similarly describes the potential for what I term *intercausality* within the boundaries of artistic research. Stévanec and Lacasse say: “we find the traditional Cartesian dualist concept of causal interactionism [*ed: the idea of interactive cause and effect*] particularly instructive for designating the bidirectional interaction of mind and body in human activity, and apply it to a different object. When transferred on to research-creation, we wish to emphasize a

²⁵⁷ Crispin, “Artistic Research and Music Scholarship,” 57.

²⁵⁸ Coessens et al, “The Artistic Turn,” 41.

²⁵⁹ Coessens et al, “The Artistic Turn,” 39.

relationship of causality between the two components;” going on to say that they “reciprocally influence each other in a dynamic and causal interaction.”²⁶⁰ This deeply resonates with Libet’s experiments, and with the theories about the neurology of decision-making described earlier. I would define intercausality as the mutual causation between and among more than one factor, influence, state or event. An example would be the fluid back and forth between brain and muscle activity and one’s sense of having made a decision, as in Libet’s research. In the context of APAR, intercausality manifests as a fluid back and forth between research and art along a membrane that rather than dividing, connects the two.

Crispin also highlights intercausality, saying that often the musical activities flow from one to the other and back again. “An artist might even revisit work originally generated without any research agenda and engage in a creative reconceptualization of it that results in its becoming Artistic Research.”²⁶¹ This description encapsulates the primary artistic work that I have created for this dissertation. Like the Hampshire College definition of research, Crispin says a non-negotiable of APAR in music is that it has to be communicated out, and further, that the results must be “articulated in such a way that the findings of the research may be shared with the wider research community.”²⁶²

Because my research is interdisciplinary, I have included several means of communicating research results. The first of those is this dissertation, for which I have deliberately chosen as plain and straightforward as possible a writing style so that the work is accessible to people across different domains. To help communicate and legitimize my case

²⁶⁰ Stévanec and Lacasse, *Research-Creation in Music and the Arts*, 125.

²⁶¹ Crispin, “Artistic Research and Music Scholarship,” 59.

²⁶² Crispin, “Artistic Research and Music Scholarship,” 59.

study to potential future empirical researchers, and because neuroimaging was not feasible, I included two quantitative tasks for my study participant — the language of science. The first was the completion, before and after the intervention, of the Edinburgh Postnatal Depression Scale, as previously discussed, a patient reported outcome measure in the form of a ten item questionnaire.²⁶³ The second task the participant completed both before and after the intervention was one rating the emotional valence of a normed set of images depicting facial expressions (the FACES task).²⁶⁴ This task is explained in Chapter 6, which describes the methods and results of my exploratory case study. The results of this task offered a noninvasive behavioral measure (a ‘stand in’ for neural activity) in the absence of fMRI. To center the maternal experience in research about postpartum depression, I included both an autoethnographic retrospective of my own experience, and a qualitative interview with the study participant. Lastly, I created a musical piece as research, using my own pedagogy, to examine and generate knowledge about my experience with postpartum depression, and communicate elements of that experience musically, which I will discuss in detail in Chapter 7.

In her proposed model of Artistic Practice as input for research, Crispin explains that “A performer or a composer asks the kinds of questions that would not naturally occur to the researcher. Many of these are intensely practical and linked to the immediate physiological and psychological demands of composing or performing music.”²⁶⁵ As a composer, performer and researcher, as well as a mother, I can attest to the overlap of these creating an extremely specific

²⁶³ See Chapter 1 for an explanation of the structure, validity and reliability of the EPDS.

²⁶⁴ Natalie C. Ebner, Michaela Riediger, and Ulman Lindenberger, “FACES—A Database of Facial Expressions in Young, Middle-Aged, and Older Women and Men: Development and Validation.” *Behavior Research Methods* 42, no. 1 (2010): 351–362. <https://doi.org/10.3758/BRM.42.1.351>.

²⁶⁵ Crispin, “Artistic Research and Music Scholarship,” 60.

experience and set of questions and routes for research and exploration, and I believe this model fits my work best. I will describe my subjective experience of this process in Chapter 7, and how it informed the design of my case study.

Crispin also says that the practice can be “current or previous” and that it is “essentially a repository of experience.”²⁶⁶ This is an extremely apt description of my initial artistic research into music creation, the composition of my first album of original music described in the following chapter. This research created a wealth of experiential information for me. The results of that research informed and fed back into the development of my compositional practice, side by side with the development of my pedagogy as a music teacher, in line with Stévan and Lacasse’s research-creation model. That experience and work created a new set of research questions, to determine if what worked for me would work for others, much like Crispin’s Artistic Research as Input, and led to the design of my study, which will be described in detail in Chapter 6.

The evolution of APAR has continued since these sources were written, and will certainly continue to evolve. In 2020, the Vienna Declaration on Artistic Research was collaboratively written by a consortium of international and European organizations, including the European Association of Conservatoires, the International Association of Film and Television Schools, Culture Action Europe, the European League for Institutes of the Arts, the European Platform for Artistic Research in Music. This declaration was “intended as a policy document addressing political decision makers, funding bodies, higher education and research institutions as well as

²⁶⁶ Crispin, “Artistic Research and Music Scholarship,” 62.

other organisations and individuals catering for and undertaking AR,”²⁶⁷ to encourage and support Artistic Research.

Their description of Artistic Research is simple and straightforward. According to Culture Action Europe, Artistic Research “is research through means of high level artistic practice and reflection; it is an epistemic inquiry, directed towards increasing knowledge, insight, understanding and skills.”²⁶⁸ The long arc of my work, beginning twenty-one years ago and reaching a point of culmination in the present day, fits easily within this definition.

To summarize, my research consists of attempted and completed musical works, which I revised and adapted with the purpose of feeling relief from symptoms during my postpartum depression. I tested and used lyrical, musical and sonic elements to process and contextualize my emotional experiences. I engaged in both traditional scholarly research to improve my practice as a composer and pedagogue, and nontraditional research outside the boundaries of institutions, in order to move towards this research goal. This research expanded and developed into study design to assess whether what had worked for me might help others, which itself generated results in the form of survey data, self-reported experiences, and a task rating the emotional valence of faces to stand in for neurological activity. As in Crispin’s models, my work blends across a spectrum of artistic and scholarly research categories, and as in Stévanec and Lacasse’s, research and creation feed back into each other in generative loops. A culminating product of my research is a new electroacoustic composition which itself generated new knowledge, discussed in Chapter 7. Although many researchers discussed herein assert that Artistic Research should be

²⁶⁷ *The Vienna Declaration on Artistic Research* (Vienna, June 2020), <https://cdn.ymaws.com/elia-artschools.org/resource/resmgr/files/vienna-declaration-on-ar24-j.pdf>

²⁶⁸ *The Vienna Declaration*.

able to stand on its own, without additional verbal communication, my methods of creating the piece will be described in detail in Chapter 7 in order to communicate my results more clearly to the wider research community.

Chapter 5: My Own Experience with Postpartum Depression

Chapter Introduction

As described in the introduction to this dissertation and referenced in Chapter 3, autoethnography is a domain of study in which the researcher is explicitly not separate from the research itself, but is both subject and investigator. Phenomenology is another such paradigm, holding that subjective human experience is valid and worthy of study, although it differs in that phenomenology asserts that subjective experience is the only category of information that can be directly known, and also seeks to find generalizable truths from many subjective experiences.²⁶⁹ Although autoethnography is not directly descended from the discipline of phenomenology, descending more directly from anthropology and ethnography²⁷⁰ they share a conceptual core of validating subjectivity.

In the previous chapter, I discussed the ways in which artistic research often sits uneasily alongside traditional scientific or empirical research, providing a theoretical foundation for the inclusion of my artistic work in a research context. New Zealand music scholar Nancy November discusses the relationship between phenomenology and arts research, concluding that although they might seem to have opposing focuses, they can mutually support each other. November connects these two domains, saying “phenomenology can be regarded as supporting the valorisation and discovery of knowledge within creative artefacts and processes,” and that “as phenomenology can support the valorisation and discovery of knowledge within and about

²⁶⁹ Nancy November, “Phenomenology, Practice-Led Research, and Applied Musicology,” in *The Routledge Companion to Applied Musicology*, ed. Chris Dromey (Routledge, 2023), 55, <https://doi.org/10.4324/9781003042983>

²⁷⁰ November. “Phenomenology, Practice-Led Research, and Applied Musicology,” 55.

creative artefacts and processes, practice-led research is a natural, practical outlet for phenomenological findings, is complementary to autoethnography, and, more fundamentally, stimulates applied creative practice itself.”²⁷¹ As this dissertation seeks to bridge autoethnography with Artistic Practice as Research (among other disciplines), I introduce November’s work here to further frame the epistemological validity of the information I have found through retrospective autoethnographic research, specifically my experiences with postpartum depression, early motherhood, and the creation of music, and further, to treat it as both input and. inquiry that led to the Artistic Practice as Research described in Chapter 7.

The aim of the chapter is not to present my personal experience as universal or generally representative of postpartum mothers. It is also not merely to put a ‘human face’ to the statistical data discussed in Chapter 1. Rather, I am using my lived experience as material through which to examine the ways in which expectations of motherhood, beliefs about musical ability and creativity, the experience of PPD, and music creation practice interacted in one (my) case. The narrative and analysis are intended to complement one another, as I revisit and interpret my experiences in relation to the frameworks developed in the previous chapters. By engaging in this interpretation, I aim to surface and examine phenomena that would not be as easily visible from population data alone, and that deeply informed the artistic and pedagogical components of this dissertation that follow. It is my hope that in providing this narrative, I am contributing to centering the maternal lived experience in generating research directions for PPD. This description of my experiences was reconstructed from my journals, memories, video and audio recordings of the time.

²⁷¹ Nancy November. “Phenomenology, Practice-led Research, and Applied Musicology.” 61.

Symbolic Interference

In Chapter 3, I described some of my experience of music as a very young child, and my experiments with the piano. The individual keys and their shapes and tones were a source of total fascination, and I intuitively absorbed their relationships to one another without any symbolic interference. Before I even knew the names of the keys, *C*, *F* and *G* were good friends in my imagination. *A* and *D* changed the mood, but they were very welcome at the party. The lowest keys made a visceral rumbling with a long echoing tail, a sound that still feels to me like I can see the pressure wave propagating through the air. The highest keys twinkled and jangled like ice chimes. I didn't know the word *glissando*, but pulling my hand down all the black keys on the keyboard made a beautiful bumpy ripple.

My mother's guitar was very different. It was a satisfyingly perfect shape to hold, but with strings that vibrated much more sharply and visibly than the piano strings with their little felt dampers. I experimented and discovered many interesting effects that could be felt by plucking the strings and touching the body of the guitar with either my fingernails or my entire palms. Plucking a string while looking straight down at it created a long shimmering arc. With both instruments, the sound changed depending on where my ears were in relation to them, whether or not I was touching the wood, and with what part of my hand.

These descriptions of my experience may seem indulgent, but what I am attempting to convey is the depth of connection that I had to music as a child unencumbered by any semiotic layering: no pitch or note names, time signatures, ants crawling on a page of notation, or

functional harmonic analysis. There was no artificially imposed intermediary between me and my experience of music and sound, and there was no external judgment or measurement to take me out of the *flow*²⁷² of the experience, another term coined by Csikszentmihalyi to describe the delightful mental state of being fully and positively absorbed in a process or activity.

I wrote briefly in Chapter 3 about how the language adults in my life used to describe my musical expression influenced my developing a fixed mindset about my own capabilities. To compound this, I went through several life transitions, and at each one, I withdrew from and then reconnected with music. Without going into the details that precipitated it, a new middle school coincided with the beginning of the end for my parents' marriage. A new high school brought a fresh start but more changes for my family; it took until my senior year for me to be comfortable enough to participate fully in the musical program. I started college the year my parents finalized their divorce, which was the same year my mother remarried. I stopped singing and playing my guitar altogether until the end of my junior year. With each of these changes, I withdrew from making music and had to work my way back to it. In retrospect, I think this may partially have been because my sense of identification with music was so strong, and I did not have the energy to constantly reassert who I was and my value to a new environment. In my fixed mindset, I did not have the personal will to prove that I was *inherently good at music* over and over again.

Over the course of my undergraduate career, I developed generalized anxiety disorder that became so symptomatic that I could no longer read out loud in front of a class, let alone sing a song. I stopped making music in front of people altogether for about five years, and did not return to it until after September 11th, 2001.

²⁷² Mihaly Csikszentmihalyi, *Flow: The Psychology of Optimal Experience* (New York: Harper & Row, 1990).

September 11, 2001 was a deeply and profoundly tragic day for families that lost loved ones, and its effects forever altered both America and the entire world. It was also personally meaningful in the lives of many people whom I knew, because we all lived in Lower Manhattan. We all used to use the World Trade Center towers as guideposts when giving tourists directions. We all watched those towers burn and fall, and we all knew people who had been killed. We all walked out of Manhattan, and smelled the smoky chemical residue for months, and none of us were ever the same again. After September 11th, like many of the friends who lived through that time and place, I developed a foregrounded sense of the fragility of life. This pushed me to start saying yes to the things that deeply terrified me, but that I desperately wanted to do.

My boyfriend at the time was my partner in this decision, and he kept a lookout for opportunities for me to confront my fears in the service of doing the things I loved. He was a bartender, some of his regulars were in a band, and they needed a backup singer. He got me hired, and I somehow managed to make it to my first professional gig in October of 2002. For the next two years, I worked to reclaim my sense of agency and ownership as someone who made music. My boyfriend and I broke up, driven by youth and the same sense that we needed to *carpe diem*. I met my future husband P.²⁷³ at a blues jam, and soon we were performing together frequently. I performed almost every night of the week in various projects, but I was still too afraid to write or perform my own music.

²⁷³ His initial has been changed for his privacy.

Prepartum

In April of 2004, I found out I was pregnant with my oldest daughter while on tour with another band, and P. and I decided to get married. Naively, I didn't have any concerns about parenthood changing my creative life. Being pregnant was the beginning of a maternal identity for me that eventually grew to be deeply healing and fulfilling. I had always wanted to be a mother, and once I got through the four months of morning sickness, I felt deeply powerful when I was pregnant. When I would go to perform with P., they would introduce me as "Mama Sarah," and I would stride up on stage confidently preceded by my big round belly.

Fulfilling the dashed dreams of my seven-year-old self, our band at the time became the first group to ever perform an original composition of mine. I wrote several pieces for us, all blues songs. Although they were fairly simple and idiomatic, I still perform them to the present day. The blues was, and is, an excellent genre in which to compose. It has clear but flexible rules and a musical tradition of including and absorbing different elements. Improvisation and real-time collaboration were part of the process. It was simple but classic, and as a teacher now, I frequently introduce blues forms as an accessible way to get students into analyzing structure. It is a beautiful and powerful form, and also a welcoming one.

Late in my pregnancy, I began to feel pushed away from the musical spaces that had become my home during the few vivid years between September 11th, 2001, and the birth of my oldest daughter. One night, while playing rhythm guitar on a gig with my husband in Brooklyn, I was startled by an audience member's sudden approach. "The transducers in that guitar will hurt your baby," he insisted. "I'm pretty sure that's not true, but thanks for the information," I said, as

I would say to so many pieces of advice I was offered about pregnancy and motherhood. “No!” he yelled as I removed myself from the area, “it’s true!” Of course I didn’t believe him. There was no evidence to suggest what he was saying would be the case, nevertheless a tiny thread of guilt winnowed its way into my experience of playing.

Just before I became pregnant, I felt I had finally worked my way fully through the anxiety that had blanketed my ability to engage with the world for years. Now, I was finally able to create and perform my own music, and to play it with others in front of audiences, and not only that, but do it professionally. This made the loss feel even worse when I stopped again.

The day before my oldest daughter was born, I walked. In one of the myriad books I was given to prepare me for what lay ahead, as if that were possible, I had read that walking was a good way to bring on labor. I was tired of being pregnant, so I dutifully walked. At the time, we were living in the far distant end of Queens, New York, in a one-bedroom apartment on the first floor of a multifamily house in a dense neighborhood. I walked and walked, pacing the limited floor space available in our small apartment. I walked the chilly grey January streets in the neighborhood, all through the afternoon and into the night. As I would later advise other mothers *not* to do, I made the terrible rookie mistake of not sleeping. P. came home from a performance around 4 AM and slept until 1:30 in the afternoon. My contractions came and went, but would not get regular. My doctors had instructed me not to go to the hospital until they were regular, so I walked; got in the shower and ran out the hot water; walked some more. Finally, the contractions felt like what I had imagined labor would be like, and I woke P., and we drove to the hospital.

The intake nurse examined me. I wasn't dilated enough. They sent us home. I got back in the shower and ran out the hot water again. When it got even worse than it had been before, we drove back to the hospital, every bump in the highway a teeth-gritting shock. This time, they admitted us.

Postpartum

My daughter was born after thirty-six or so hours of laboring (my mother came to the hospital and read aloud to me to help distract me). The moment she was born, I immediately thought it was the best day of my life. She kicked me, and her kick felt the same as it had felt when she kicked in my womb. She was literally a bundle of joy, and I was overjoyed. The thing I found the most difficult was that the nurses kept taking her away. Even though I had selected "rooming-in," meaning that I wanted her to stay with me, they kept taking her away to the nursery, and chiding me for not appreciating the time alone. "You'll get her for the rest of your life," they clucked. I didn't care, I wanted her with me now.

We were sent home from the hospital after the second night, with instructions to check in with the pediatrician. When we did, my daughter also had a little jaundice, and the lab results came back with elevated levels of the compound bilirubin, a signal that her little liver was not quite working correctly yet. The day after we went home, I got a phone call. The doctors wanted me to bring her back to the hospital to stay in the newborn intensive care unit for an overnight. I frantically packed all the things I thought she would need, not realizing that of course they would have everything there.

When we arrived, the night nurse in the NICU acted in a way that was off-putting and damaging. She snapped at me not to touch my daughter, as she lay in the little plastic tray under the lights. “Stop fussing with her. She has to learn to soothe herself,” she said. I thought that was deeply absurd, given that my daughter had barely attained the age of three days old, but I allowed myself to be shushed out of the room. I spent the night in fractured sleep, devastated to be away from this little person I had only met a few days ago.

The morning nurse was more welcoming. “She’s your baby!” she replied, when I asked if I could pick her up. Now, this is just a correlation, and it is certainly possible that I would have developed symptoms of PPD without the thoughtless intervention of the night nurse. Nevertheless at the time I felt that some strange damage had been done, or some internal switch activated. I now felt like my daughter was fragile and delicate, like I could accidentally break her. I was persistently afraid of perceived threats to her: I was afraid to let other people hold her, but sometimes I was afraid to hold her. I was certainly afraid to kiss her lest I infect her with some hidden germ. I feared invisible pathogens to the point where I washed little squares of flannel every day and put them down on the surfaces she would touch in our home. When she started eating solids, I was afraid to give her anything less than the most perfect possible foods — no sugar, no artificial colors, nothing that was not organic. I would frequently make her a little bowl of food and then throw it away and start over, afraid it had somehow become contaminated without my knowing. My sleep also changed: I woke at the slightest sound, and checked on her every time. My threat detection system was hyperactivated.

Before she started eating solids, I was afraid to give her formula, having absorbed the unfortunate and untrue idea that it was full of harmful chemicals. When my daughter came home

from the NICU, she had trouble nursing. At the time, I felt very strongly about breastfeeding being the only way to feed my daughter; in retrospect I can see that I was influenced by the beginning of the online wellness movement to have an all-or-nothing view of that choice in a way that negatively impacted my mental health. Initially, nursing was nerve-wracking and difficult. My daughter had difficulty latching, and was sleepy and difficult to rouse. For about the first three months every feeding came with feelings of desperation and urgency. The stakes felt very high, and I felt like I was doing everything wrong.

Aside from the fear, the hardest aspect of that time in my life was the absolutely inescapable, all-pervasive sense of isolation. I had never felt more alone in my life. I loved my daughter very deeply and immediately, but she was a little baby and couldn't talk. There was no conversation, no companionship, no one who understood what changes were happening in our lives. I was a first-time mom in my early twenties, and only the second in my group of friends to have a baby — the first of us had moved to Alaska. No one was in the same stage of life as I was. All my friends, particularly the musicians, were all still going out all night most nights. My husband wanted to do the same. I only had one friend who would make the long train trip out to the very end of Queens to come and visit, and I leaned on her very heavily. The other moms in the neighborhood were older than I was, with different interests and styles of socializing, and it felt very hard to make friends. I would walk and walk with the baby in the stroller, watching people on the sidewalk who looked like they were enjoying their lives, and wondering how I could possibly get to that place. I remember walking down our street and seeing neighbors working on their lawns or cars, and thinking to myself, "this is someone's idea of Heaven...but it's not mine."

During this period, I listened to music almost constantly, but I was not able to make any. Three sounds formed the foundation of my sonic experience of the time, and I still associate those sounds with being alone: wind in the trees, rain on the roof and Jazz on the radio. I can remember one night, I was singing and walking around the bedroom with an egg shaker, trying to summon the feeling I used to have when I was making music with others. I wouldn't be able to articulate this until many years later, but the process of making music came with a feeling of shared consciousness for me, whether I was making it with others or not. It also came with a sense of myself as having value and competence without being ego-centric; being fully absorbed in the work and the present moment. Later I would read about Csikszentmihalyi's flow and immediately resonate with the concept. Just as I was starting to feel a little bit of magic, I noticed my husband looking at me like I was crazy, and the spell was broken.

Processing through Music

I began making music again when I finally decided to divorce P. The ability to create songs about my experience helped me to gather the energy and will to go through with what was a very hard decision both to make and to enact. I made my first album of original music in my mother's barn-studio, while my daughter and I were staying with her in the year following my divorce. All the songs on that album were my attempts to process the experiences I had in my marriage, and intertwined into that experience was my postpartum depression. *Moonshine* was about the ways musicians often romanticize alcohol. *Baloolah Blues* was about being home alone with a crying child. *Home* was about our relationship being a sort of quest for an idealized

version of home that didn't exist. *Momma's Got the Confusion* was a Jimi Hendrix-inspired blues rock song about the extreme difficulty I felt in making decisions. The darkest piece, *Le Temps*, was a song in French about the different ways in which I might die.

Making music provided for me a very particular type of healing and energy. It allowed me to take the experiences I was having out of my head and body and look at them as if they were parts of an artistic work. Returning to Wolfgang Mastnak's "resource-oriented" view of music therapy, I experienced "music-guided readjustment of life philosophies and self-concept, and musically controlled energy and mood regulation."²⁷⁴ In Chapter 2 I discussed the similarities between Mastnak's view and Cognitive Behavioral Therapy (CBT). In Acceptance and Commitment Therapy, a type of CBT, patients are often coached to view themselves as the sky and their feelings as the weather;²⁷⁵ transient, flowing, even beautiful in their patterns. This creates a separation between the person experiencing the feelings and the feelings themselves. In creating my own music, I no longer had to over-identify with my own emotions, because I could take them out and work with them; shape them into a piece of music that had aesthetic and personal value and beauty. The experiences became part of something separate from me that I could make use of and value. I was able to feel effective when I was creating.

In the following chapter, I will discuss how my experiences deeply influenced my pedagogy when I began teaching. After I moved with my young daughter, I began teaching preschool and music at a school near where my mother lived at the time. The director of that preschool gave me the book *How to Talk So Kids Will Listen, and Listen So Kids Will Talk*, which

²⁷⁴ Mastnak, "Perinatal Music Therapy," 186.

²⁷⁵ Richard Bennett and Joseph E. Oliver, *Acceptance and Commitment Therapy: 100 Key Points and Techniques*, 1st ed. (London: Routledge, 2019), page number, <https://doi.org/10.4324/9781351056144>.

draws heavily on Dweck's theory of growth and fixed mindset — the book is a guide for adults in healthy ways to talk to children about their emotions and creations, to encourage agency and self-efficacy. Many of the concepts and methods of framing that I first learned in that book underpin my teaching with both children and adults. I will discuss my teaching philosophy and pedagogy and how I used it to develop the design for my case study in Chapter 6.

Chapter 6: Incorporating Growth Mindset into Music Pedagogy, and a Case Study

Chapter Introduction

My experiences as a music student, parent and teacher led me to the development of a pedagogy of creativity that I feel is well-suited to structuring an intervention guiding mothers with PPD to creating their own music. In this chapter, I will discuss my main pedagogical inspirations and describe how I designed and conducted a case study with a young mother experiencing symptoms of PPD.

In the speech I gave the young artists of 2014, I explained a concept that is deeply important to me: most domains of teaching and learning comprise tools made by human minds for human minds. In my experience as a teacher, this often seems to get lost by people working in those domains, who treat these tools as objective truths. In my speech, I told the students that although I appreciate the beauty of good notation, and that fluent reading, “having hours of scales under your fingers, and correct posture and position take a diligent student with capacity farther than they could go without those foundations,” nevertheless it is perfectly possible to play music at a very high level without ever reading a note.

Dillon Parmer describes this as what he calls “intellectual despotism,” the subordination of embodied musical knowledge to more theoretical, intellectual forms of analysis. He concludes “that the practice of music-making is hardly the superfluous activity a decade of musicological disciplining—my academic deformation, if you will—tried so hard to program me into believing, an activity that becomes epistemologically authoritative only when informed by the supposedly clearer perspectives of music history, theory, analysis criticism, or some other brand of derivative

music scholarship. On the contrary, performing is the very basis for making sense of music at all. It is, as others have argued under the auspices of praxis and embodied cognition, a primary source for understanding the art.”²⁷⁶ This concept is deeply important in a discussion of music creation pedagogy because we limit the creative potential of humanity through practices that make anyone feel like they aren’t welcome to contribute to the evolution of knowledge and practice in a creative discipline. One person’s incorrect position is another person’s extended technique. I finished my speech by saying, “These are not fixed concepts and practices. They have evolved, and they can continue to evolve. Everyone is welcomed as co-creators in this evolution.” I find myself repeating this concept frequently as I go through not only this dissertation, but this life. I feel that it bears repeating. As in the dissertation generally, this chapter is not written with the structure or conventions of an empirical study, but takes a narrative and descriptive approach.

What can we do?

First among the pedagogical practices that we can leverage to include is the way we talk. The way we describe people’s creative work contributes to their sense of self-efficacy relative to that work, especially for those of us who are in a position of teaching a creative discipline. As I experienced in my own life and described in Chapter 5, well-intentioned praise of my musical efforts correlated with my developing a fixed mindset relative to my creative potential. Early in my teaching career, the director of my school gave me a copy of the book “How to Talk So Kids

²⁷⁶ Dillon Parmer, “Musicology, Performance, Slavery: Intellectual Despotism and the Politics of Musical Understanding,” *Intersections: Canadian Journal of Music* 34, nos. 1–2 (2014): 81, <https://doi.org/10.7202/1030870ar>, 81

Will Listen, and Listen So Kids Will Talk.”²⁷⁷ Although this is a book intended for parents of children, it contains valuable and actionable advice for teachers or guides of students in creative practice at any age. In particular, authors Adele Faber and Elaine Mazlish have a functional approach to praise, and a helpful way of explaining that approach to adults. They write a series of scenarios, instructing the reader to write in their reactions. For example:

Situation I: You have an unexpected guest for dinner. You heat a can of cream of chicken soup, add some leftover chicken, and serve it over Minute Rice.

Your guest says,

“You’re a great cook!”

Your inner reaction:

...Situation III: You’re taking an adult-education course. After a lively class discussion in which you participate, another student comes up to you and says, “You have a brilliant mind.”²⁷⁸

In this way, the authors lead the reader to the realization that when praise is worded in a way that evaluates or compliments qualities out of our control, it can result in anxiety, doubt, and a focus on our own sense of our weaknesses. Instead, they write, we should offer what is called *descriptive praise*, simply describing in an appreciative way what we notice about the work. This results in the recipient of the praise feeling that their *work* is seen. Rather than saying “this drawing you made me is beautiful,” one might say, “I love how you used blue for the flowers.” Although it might seem like a simple shift, in my opinion, it empowers the student or creator by disconnecting praise from inherent qualities. Recalling Dweck’s work from Chapter 3, it embeds a growth mindset rather than a fixed mindset in the communication of teaching.

²⁷⁷ Adele Faber and Elaine Mazlish, *How to Talk So Kids Will Listen and Listen So Kids Will Talk*, 4th ed. (London: Piccadilly Press, 2017).

²⁷⁸ Faber and Mazlish, *How to Talk So Kids Will Listen*, 167.

In my experience, teaching practice that imbues a sense of not only empowerment, but agency and choice to the learner is key in demystifying the process of creating music, which in turn makes it accessible to people for whom it can be transformative and healing. Around the same time as I gave the speech referenced earlier, I had the pleasure of taking an online workshop with Pat Pattison, a long time songwriting teacher at the Berklee College of Music in Boston, Massachusetts. I found his pedagogy to be fantastic, accessible, and concrete, and I immediately incorporated it into both my own compositional practice and my own teaching.

In the workshop, Pattison plainly and straightforwardly demonstrated the steps that he teaches people to use in writing songs. He also intentionally made it seem accessible, reassuring everyone that they did not need to know how to read music or play an instrument in order to create a song, although that was welcome. He also said, and this is crucial, “writing a song is a real challenge. You will need all the help you can get.”²⁷⁹ Growth mindset was embedded right from the beginning. This stands in marked contrast to the idea of creativity as a magic process that is the result of inherent talent.

Three Boxes

Pattison taught us to first decide what we wanted the song to be about, encapsulate it in a title, and then write from the title, taking it through a sequence of three ‘boxes,’ or changes, to create three verses. According to Pattison, “A title helps you to organize the flow of the ideas that populate your other sections. It gives you a target for the other sections of the song to aim at -

²⁷⁹ Pat Pattison, “Developing Verse Ideas,” *Pat Pattison*, accessed May 2, 2026, <https://www.patpattison.com/developing-verse-ideas>.

something to lead up to and develop from,”²⁸⁰ says Pattison. To create a concrete example, I will use the hypothetical title “You’re Always By My Side,” and take it through a progression:

You’re my constant companion, we’re always together — *you’re always by my side*
I don’t have any memories without you, I’m not sure who I would be without you —
you’re always by my side
I kind of want to know what it would be like without — *you always by my side*

The concept is taken through three changes of interpretation, what Pattison calls “colors,” to create three different sections of a song. While I created a little emotional and narrative twist in the final box, this process works to create a flow of expectations through any sequence of emotions, events, moods, concepts, or whatever the composer or writer chooses. In my own practice, I extended this method such that the title or encapsulation can be substituted for any key concept, feeling, event, or thing that the writer or composer wants to express in a song, i.e., the purpose of the song. This is not to imply that songs need to have a purpose; I merely offer it as a tool to scaffold creation. Once the purpose of a song has been identified, whatever it may be, the creator then can make a series of concrete choices to align lyrical and musical elements. This technique can also be adapted to any type of music that is non lyrical by making alignment choices of musical elements, which I will describe further below.

Pattison describes the role of structuring listener expectations by comparing it to motherhood, which I love, for reasons that will probably be apparent. Because this is such an apt metaphor, I hope the reader will indulge me in including a longer quote. Pattison says,

Structure Creates Expectations. That’s what it’s for. To take you on a journey, and, as any good mom knows, to get the kids all revved up about what they’re gonna see, to build up excitement as the trip gets closer. Then to watch their eyes get bigger as they stretch their necks trying to see around the corner. Almost there...
Or sometimes she tells you to just get in the car. You’re going somewhere, but she won’t

²⁸⁰ Pattison, “Developing Verse Ideas.”

tell you where. It'll be a surprise. Moms are like that sometimes. So is structure. Moms are supposed to provide structure, to organize things so the kids have the right kind of journey, whether it be to Pirate's Cove or through life. You're the mom. You get to choose what kind of trip you want your song to take.²⁸¹

Pattison's three box method works for structuring music with lyrics, and it also works to structure instrumental or electroacoustic music. The essential format is: the creator has something specific to convey; the creator understands that the listener needs expectations that the composer will either fulfill or violate, so the composer uses their concept and how it changes over time to create structure. Then you fill in the blanks.

Another valuable concept I learned from Pattison is the application of the linguistic concept of prosody to music creation.²⁸² Prosody is the way in which the pitch movement of speech aligns with the meaning of words, for example, pitch and intonation rising at the end of a question. The concept is borrowed from studies of speech and language.²⁸³ Prosody varies by language, but it is not usually explicitly taught — it just sounds incorrect when it is incorrect. Pattison demonstrates how to use prosody to create melody for a text by exaggerating the natural speech pattern of a line of lyrics, and then placing the pitches higher or lower as they would be if the line were spoken.

I do not remember if Pattison gave our workshop this guideline, but I extend the concept of prosody to musical, instrumental and arrangement elements when I teach songwriting or composition, much like Renaissance composers used sound painting to align words with musical

²⁸¹ Pat Pattison, "Structure Creates Expectations," *Pat Pattison*, accessed March 15, 2026, <https://www.patpattison.com/structure-creates-expectations>.

²⁸² Pat Pattison, "Language and Songwriting," *Pat Pattison*, accessed March 16, 2026, <https://www.patpattison.com/language-and-songwriting>.

²⁸³ University of Kansas, "Chapter 5: Intonation and Prosody," *American English Pronunciation*, accessed April 25, 2026, https://opentext.ku.edu/amenglishpronunciation/chapter/intonation_prosody/.

actions. Every element of the music can either align or not align with what the composer or songwriter is trying to express. The next step in my process is to explicitly show the student the palette of options. In Chapter 3, I discussed how the division of music into categorical components for *evaluative* purposes can have a limiting effect on student creativity, but offering these elements as a *set of tools* from which to choose is empowering. Each of these elements will have a particular subjective feeling to any given person, and I guide students toward developing an awareness of what their own subjective feelings are about each:

- Tempo
- Instrumentation
- Dynamics
- Arrangement
- Register
- Timbre
- Harmony or tonality (or the lack of these elements)

Although the idea of major for happy and minor for sad is commonly thought to be embedded in the experience of the average listener of Western music,²⁸⁴ in my experience with contemporary students, associations of emotions with any particular harmony, rhythm, timbre, or other element of music are wildly subjective and unpredictable. While I may feel that even meter in a line aligns with positive emotions or concepts, and odd with mixed or negative, someone else may feel completely the opposite. As discussed in Chapter 3, the component facets of music can be conceived and described in myriad ways beyond what we accept as the norm based on our respective educations and backgrounds.

²⁸⁴ George Athanasopoulos, Tuomas Eerola, Imre Lahdelma, and Maximos Kaliakatsos-Papakostas, “Harmonic Organisation Conveys Both Universal and Culture-Specific Cues for Emotional Expression in Music,” *PLOS ONE* 16, no. 1 (2021): e0244964, <https://doi.org/10.1371/journal.pone.0244964>.

A Palette of Choices

The difference between my pedagogy and what I described as the standard in Chapter 3, is that rather than presenting these criteria as a rubric by which music is evaluated, or as criteria which must be present in order for music to be valid, I present these elements as ingredients someone is welcome to use, or not to use. The frame is thus shifted from one of needing inspiration or falling short of evaluation to one of construction. I teach students to go through the components of their piece and see if they want the elements to align with or not align with the song's purpose, according to their own internal experience of which musical elements convey various emotions, concepts, or ideas.

Recalling Mastnak's theory from Chapter 2, defining and presenting these component building blocks is intended to embed a sense of self-efficacy for the learner. The fundamental idea is to show them one way of deconstructing the process, and to clearly communicate that this is just one way, and any choices or changes they would like to make are welcome. Taking apart existing songs can be also useful in demystifying the process of writing music. For example, I often use the Turtles' song "Happy Together" as an example of a piece where the individual musical elements do not necessarily align with the emotions that I perceive, but the result is nevertheless a subjectively catchy and objectively successful song.

In designing my study, I drew heavily upon these pedagogical sources, as well as my own experience as an artist, teacher, and researcher with PPD as described in Chapters 4 and 5. My experience of making my own music had helped me view my emotions as separate from myself, and process them as materials for creation. The benefits I had perceived through this reframing

capability, along with my research into its potential mechanisms considered relative to the postpartum brain, led me to choose creation rather than passive listening, and individual rather than group music creation for my study.

Case Study: D

In order to study the potential of an NMT-based music composition intervention as a research direction for approaches to postpartum depression, I recruited D.,²⁸⁵ a young mother in her early twenties, from a postpartum message board online. In order to ensure the safety of any participants, before recruiting, I went through a rigorous process of study design evaluation by the Ethics Review Board. I included in the consent form that women who were experiencing postpartum psychosis, suicidal ideation, or extreme mood swings should not participate, for their own safety. Given that severe symptoms can develop suddenly, I explained that I would inform participants that if they began to experience these symptoms, they would be connected with a higher level of care, and should not continue participating in the study. Similarly, I made clear to potential recruits that participation in therapy was a condition of participation in the study, and asked that potential participants inform me if they ceased therapy during the course of the study.

As I am not a clinician, I assured the ERB that I would not attempt to probe the participants' emotions, but rather offer a supportive space where they would be welcome to express emotions musically if they chose to do so. I communicated explicitly to potential participants that if they did not wish to engage emotionally with the music creation, but wanted to create music that was purely abstract or not representational, that was perfectly acceptable. I

²⁸⁵ For reasons of confidentiality, D. is not her actual first initial.

also assured the ERB that I would clearly and repeatedly communicate, both in recruitment materials, and sessions, that participants were not required to participate, and that they were free to leave the study at any time and for any reason, with no consequences. I also detailed the ways in which I would keep participants information strictly confidential. To make it easy for mothers of young children, I offered the intervention over Zoom and made it clear that children were welcome to come with moms.

D. and I worked together for six weeks, meeting one-on-one via videoconferencing once a week for thirty minutes each session. Her baby frequently attended sessions with her. D.'s background exemplified many common characteristics of mothers with PPD. She was in her early twenties, had moved far away from her family of origin to live with her husband and young son, and she was feeling isolated. She had sought out treatment on her own for symptoms of postpartum depression, and was engaging in conventional talk therapy and taking medication. D. was very motivated to find ways to help herself feel better, but she was experiencing significant challenges. She and her family were experiencing some economic hardship, and she was far from her family and community support systems. D also had a background in engaging with music as a high school student, and had a deep love of music. She expressed explicitly during our initial meeting that while she had always used music to "help me feel my emotions," she had never thought that she could create any music of her own.

Before beginning the intervention, we met once to review the structure and format of the study, and sign the consent forms to participate. D. expressed willingness and excitement to be a part of the study. Before beginning the intervention, D. completed an online task rating the emotional valence of a normed set of faces from the Max Plank Institute for Human

Development in Germany.²⁸⁶ This set of images shows the faces of 171 women and men in three

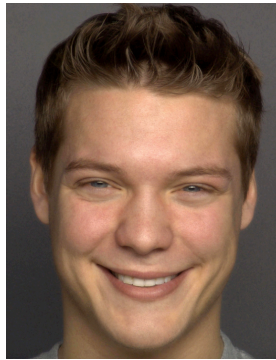


Figure 1

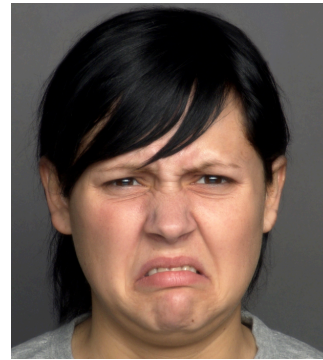


Figure 2

age categories, and each subject is photographed making six facial expressions: neutral, sad, disgusted, afraid, angry, and happy (two examples are shown in figs. 1 and 2 above). This resource was developed between 2005 and 2007 by Natalie C. Ebner, Michaela Riediger, and Ulman Lindenberger. They conducted a validation study of 154 women and men to norm the set; each picture is accompanied by the average rating by participants in that study of the emotion it conveys.

D. was directed to rate the emotions on a Likert-type rating scale from one to five, with one being completely negative, three being neutral, and five being completely positive. Using a normed set of stimuli like this is a behavioral way to measure whether someone is demonstrating an attentional bias toward negative or positive stimuli, when compared to those norms.

Numerous studies have shown that depressed individuals demonstrate a bias both away from

²⁸⁶ Natalie C. Ebner, Michaela Riediger, and Ulman Lindenberger, “FACES—A Database of Facial Expressions in Young, Middle-Aged, and Older Women and Men: Development and Validation,” *Behavior Research Methods* 42, no. 1 (2010): 351–362, <https://doi.org/10.3758/BRM.42.1.351>.

positive stimuli and toward negative stimuli, as discussed in Chapter 1.²⁸⁷ Depressive symptoms are also correlated with participants rating a higher proportion of neutral faces as negative relative to the average rating of all participants.²⁸⁸

D. completed the Edinburgh Postnatal Depression Scale (the ten-item patient reported survey described in Chapter 1) prior to beginning the intervention. Her self-rating scored a 20, which is consistent with someone experiencing postpartum depression — 13 is the threshold for recommending further intervention.²⁸⁹ Her ratings of the emotional valence and intensity of the facial expressions in the faces set would suggest a possible negative attention bias consistent with someone experiencing depression: in seven out of the fifty faces, D. rated the expression as at least one scale degree more negative than the normed rating.

During our first working session, I gave D a deconstruction of the component elements of music. I did this so that we would have a common vocabulary to use when discussing her choices, to scaffold the concept of music as something that could be constructed rather than inspired, and increase her sense of self-efficacy. I defined melody and harmony, timbre and tone, dynamics, instrumentation and lyrics in layperson's terms, and asked which of these she would

²⁸⁷ Andrew D. Peckham, R. Kathryn McHugh, and Michael W. Otto, "A Meta-Analysis of the Magnitude of Biased Attention in Depression," *Depression and Anxiety* 27, no. 12 (2010): 1135–1142, <https://doi.org/10.1002/da.20755>.

Anne C. Mennen, Kenneth A. Norman, and Nicholas B. Turk-Browne, "Attentional Bias in Depression: Understanding Mechanisms to Improve Training and Treatment," *Current Opinion in Psychology* 29 (2019): 266–273, <https://doi.org/10.1016/j.copsyc.2019.07.036>.

Almudena Duque and Carmelo Vázquez, "Double Attention Bias for Positive and Negative Emotional Faces in Clinical Depression: Evidence from an Eye-Tracking Study," *Journal of Behavior Therapy and Experimental Psychiatry* 46 (2015): 107–114, <https://doi.org/10.1016/j.jbtep.2014.09.005>.

²⁸⁸ Jukka M. Leppänen, Maarten Milders, J. Stephen Bell, Emma Terriere, and Jari K. Hietanen, "Depression Biases the Recognition of Emotionally Neutral Faces," *Psychiatry Research* 128, no. 2 (2004): 123–133, <https://doi.org/10.1016/j.psychres.2004.05.020>.

²⁸⁹ Public Health Nursing Practice, Education and Research Program, *Administration, Scoring & Interpretation of the Edinburgh Postnatal Depression Scale (EPDS)*, accessed April 25, 2026, <https://phnprep.ca/wp-content/uploads/2025/07/Administration-Scoring-Interpretation-of-the-Edinburgh-Postnatal-Depression-Scale-EPDS.pdf>.

like to focus on. D. chose words as the most meaningful element for her. She shared with me that she sang songs to her baby whenever she changed his diaper.

To foster a growth mindset and maximal creativity, it was important for me to explicitly communicate the idea that songwriting does not require a magic spark of inspiration, but rather to just start generating raw material and then revising or throwing out what you don't find suitable. I explained this concept to D, and then we brainstormed descriptive thoughts about her baby. Using Pat Pattison's 'three-box' method as described earlier, we drew three boxes on a digital whiteboard to sequence the story she wanted to tell about her baby.

D. had chosen the concept of loving her baby from his toes to his head, because of her habit of singing to him during diaper changes. Her chorus/refrain was a lovely and sweet line expressing that concept. D. expressed feeling happy and good because she never thought she could write a song. She also verbally expressed being worried that I would think her ideas were stupid. I reassured her that I did not.

Once the 'three-box' progression is established in a songwriting session, another helpful scaffold is to brainstorm as many words as possible associated with the idea in each 'box,' with the goal of having an abundance of extra words. Creativity involves making connections, and one way to generate connections is to fill the brain full of many concepts and words to combine in new permutations. D. asked me what you do when you get stuck, and I suggested the strategy of going through the five senses. This is often productive for generating — what would we see, feel, hear, taste and smell in each box? What time of day is it, what season, what temperature? In my experience, engaging the body through sensory imagination in generating ideas is another way to help the mind overcome perfectionism, and allow the writer to just describe what is

happening in the imagination. As soon as we had generated an abundance of descriptive words and phrases, we visited the rhyming dictionary. D. came up with four lines to make the first verse. She expressed that she had been worried I would judge her choices of words but felt encouraged by my positive feedback, which helped her feel capable of writing songs.

During our second session we returned to the whiteboard and she finished the lyrics to her song following the same steps described above. We went through a similar trial-and-error process, with repeated emphasis on the idea that if she didn't like any of the choices she made, none of them were permanent, and all of them could be changed. To counteract the embedded fixed mindset in much of music pedagogy as previously discussed, I repeated that choices can be changed. This can be a deeply reassuring concept, and it seemed to be so here.

The objective of our third session was for me to record the guitar accompaniment to D's song. To help her identify her own subjective experience of musical harmony, I played major, minor and a variety of suspended chords for her. She identified and selected the chords she felt like expressed her feelings of delight in her child that she wanted to express through the song. It was a modal mixture of chords including a relative minor. I demonstrated several options of tempi and strumming patterns, and she chose a loose and relaxed folk style of strum at a moderate tempo. I then recorded the guitar track, and she reviewed it on headphones. I made sure to reiterate repeatedly that if she wanted to change any element of the guitar accompaniment, I would be more than happy to re-record it. We also set her lyrics to a melody, based on Pattison's concept of using the prosody of the spoken line as a template, which I demonstrated.

During the fourth session we recorded D's vocals. I wanted to make sure that she would be able to do this on her own in the future, so I showed her how to use Soundtrap, a remote,

cloud-based Digital Audio Workstation that allows for real-time collaboration. We practiced her singing through the song a few times, and I reiterated that we could record her vocal as many times as we wanted to until she was happy with the result. I showed her how to do what is called *comping* a take, meaning that she could record a portion at a time, and then subsequently stitch the pieces together to assemble one performance out of her favorite takes. I also showed her that she could adjust the timing of her vocal performance relative to the instrumental track. We recorded and edited a few takes of her vocal.

During the fifth session I showed D a palette of options to fill out the arrangement of the song, including adding vocal harmony, percussion, or additional instruments, giving her the option to leave it as it was. She chose to add the ukulele. We ran through some ukulele picking patterns of the same chords present in the guitar arrangement, and she made a choice, which I recorded. During this session, D's baby was sitting on her lap. He was visibly intrigued by the process, and mother and baby appeared to really enjoy the activity together.

The last session was focused on finalizing the song. I showed D how to add some gentle processing to her music, such as reverb, and how to mix the different tracks so that their relative volumes would be subjectively pleasing to her. We played her song for her baby, who was fascinated. I subsequently downloaded the mix and sent it to her so that she would have it to play whenever she liked.

Results, Implications and Recommendations for Further Study

After we finished our last session, D completed both the EPDS and the task rating the emotional valence of faces a second time. Although her ratings of seven out of the fifty faces were at least one scale degree more positive than her ratings prior to the intervention, six of her fifty ratings were still more negative than the normed rating. This suggests a possible reduction in depressive symptoms, but a persistent negative bias.

Although at the time I was using the FACES rating task as a less desirable alternative to fMRI, in hindsight I think the data that can be generated with a task like this may have advantages. As discussed in Chapter 2, although the symptoms of PPD are similar to symptoms of MDD and other depressive disorders, the underlying neurological activity appears to be different. As previously described, this task measures only a negative attentional bias, or the over-assignment of negative meaning to stimuli relative to the norm, which correlates with depressive symptoms. Nevertheless, the task cannot show the actual processes occurring in the brain. I hope that future researchers will be able to combine fMRI or other neuroimaging techniques with a music creation intervention for mothers with PPD to more clearly determine any potential mechanisms of action.

D. completed the EPDS again following the intervention. Her score fell to a 3, which is a significant reduction. However, given that she was a single study participant, and there are many potential factors that could explain this reduction, it is not possible to draw any conclusions from this as a data point. Six weeks had passed from the beginning of the intervention, and many factors embedded in the process (e.g. it was a pleasant, engaging and validating activity), as well as outside factors that I cannot know, could have contributed to her self-reported improvement. Indeed, D's self report of the process was very positive. In a post-study qualitative interview, D.

said “I felt way happier and more satisfied with my life. I felt more confident.” She observed that her emotional experience of music felt different with music she had created herself. She described the process as “definitely harder, but also like most things that are more difficult, it was more rewarding. I felt like I achieved something when I finished a session.” About her sense of self-concept, she said “I feel like music helps you define your sense of self concept. Helps you think about who you are and how you want to be and kind of put that into words and put that into emotions.” She described creating the music as “meaningful” and “challenging,” and said “I used to think that I couldn’t write music or make music, I thought that I just didn’t have the talent, but I am proud of it...I could make music.” D. said that she shared the song with her husband and family, and that she continued to sing it to her baby. My observations of mother and baby during the study seemed to corroborate a meaningful and fulfilling experience.

D. was a very motivated participant in the study process, and although that was very gratifying for me as a researcher, it is possible that her motivation itself could be a confounding factor in the results. In order to see if the benefits I observed would be replicable, repeating the study with a larger cohort of mothers would be necessary. Including a control group engaging only in conventional therapies would allow for the gathering of more data on the efficacy of the intervention. Further, longitudinal or follow-up studies would allow empirical researchers to measure the persistence of any effects.

Although this case study only reflects the experience of one participant, taken together with data from the studies reviewed in Chapter 2, it adds credence to music creation as a research direction for the development of future therapies. Music creation can be a successful and low-risk intervention that reduces a mother’s depressive symptoms. This mother’s self-reported

experience also expressed increased feelings of self-efficacy and pride, in line with results from studies discussed in Chapter 2, as well as my own experience of increased self-efficacy and emotional regulation as discussed in Chapters 4 and 5. Further neuroimaging research would be welcome to identify more clearly the underlying mechanisms of action, specifically in the postpartum brain. Longitudinal studies measuring any persistence of effect would also be valuable. In the next chapter, I will explain how I used this music creation practice to create a new piece of music to further process my past experiences of postpartum depression in the present day.

Chapter 7: My Artistic Practice in Action: Carrying

In this chapter I will explain how I used the process described in the previous chapter to create a new piece of electroacoustic music for myself as a continuation and development of my Artistic Practice as Research. This process allowed me not only to derive a personal therapeutic benefit, but also to examine and explore my past experiences, and generate and communicate knowledge about PPD. In my life as a composer, I consistently use variants of the practice I used to create this piece to process and transform experiences into music in a way that I experience as therapeutic; this then generates a mode of communicating these experiences to others that contains information that would not be able to be otherwise easily conveyed. For example, the creation of music allows for the layering of sound from times and places in a non-linear way, and listening to music creates an embodied sensory and emotional response in the listener, albeit a subjective one.

The piece, titled “Carrying,” is in three movements: “Chambered,” “Little Neck Soundwalk,” and “Heaven Is.” It is available to listen to by clicking here: [Carrying](#). The reader is welcome to listen to it before or after reading about my process of making it.

The Process

I have always had archivist tendencies, another tendency inherited from both sides of my family. As a child, I kept everything, and I still have curated boxes and bins: of my journals, art and schoolwork; stuffed animals and clothes I will never wear again but to which I feel a

sentimental connection, and, helpfully for an electroacoustic and audiovisual composer, collections of recordings I made on a variety of now-historical media, including audio cassettes, CDs, VHS tapes and mini-DV tapes.

In college, my mother bought me what was at the time the cutting edge of technology, a Sony digital video camcorder. I began archiving moments of my life in a video journal, just before the advent of the iPhone when everyone else in the world discovered the delights of this practice. Later, I would use both the video and audio from these archives as input into new creative pieces. The first such piece was “August,” an electroacoustic audiovisual piece I composed in 2018 as part of my MFA in Music Composition at Vermont College of Fine Arts. This piece used recordings from August of 2001 to explore my perception of the patterns unfolding in the world and my own life since that time. Working with the recorded moments helped me process the experiences contained in them as something separate from me, that could be looked at and understood, rather than as a sort of incomprehensible emotional and sensory data that happens too fast to properly perceive or absorb the first time around. These personal artifacts became the raw material for my composition, and in using them in this way, they contributed to my research as objects of inquiry. I was able to take moments of my past experiences and work with them outside of myself as components of a piece of music, from my perspective in the present day.

As described previously in Chapter 3, the framework of Cognitive Behavioral Therapy (CBT) encourages participants to see thoughts and emotions as something separate from the self that can be observed. The process of working with my experiences and transforming them into

music operates similarly: it allows me both to see the experiences as separate from myself, and to see the value of these experiences as part of my artistic practice.

As with the songwriting and compositional practice I described in Chapter 6, my first step in the process of composing this piece as part of my dissertation was to create a sequence of three ‘boxes,’ or temporal and conceptual ‘containers’ for the work. I decided that I wanted to include the ideas of gestation and transition into motherhood, the period of PPD that I experienced with my oldest daughter, and then the sublimation and processing of that experience into a piece of music, represented by the piece of music itself.

Once I had my sequence, the next step was to gather the materials. In a songwriting process such as the one I went through with D., this would consist of gathering words. Because I wanted to work with actual moments of time as my material rather than structuring it based on a verbal progression, I gathered recordings and other materials from my archives. For the reader who is knowledgeable about electroacoustic music history, this is similar conceptually to *musique concrète*, Pierre Schaeffer’s theoretical approach to making music out of the existing sounds of the world.²⁹⁰ I had audio and video recordings of myself describing my experiences and interacting with my oldest daughter, and written records like the black-and-white marbled notebook that cost 1.99 at the CVS, in which I wrote when I was at the lowest point of my first experience of postpartum depression.

In Chapter 5, I mentioned that there were several sounds I associated with my first experience of postpartum depression: wind in the trees and rain; jazz on the radio, and the distant train. I sourced a field recording of the particular train line I could hear from my apartment at the

²⁹⁰ Pierre Schaeffer, *À la recherche d’une musique concrète* (Paris: Éditions du Seuil, 1952).

time, and used Krotos, a digital soundscaping software, to blend the sounds of several different kinds of wind and rain. My symbolic compositional goal was to connect that time in my life to the present day, so that I could create an artistic pathway transmitting compassion to my past self, and also so that my present self could perceive and absorb ways in which those moments might have contributed to the arc of my artistic development.

In order to strengthen this symbolic connection, I made several recordings in the present day to use as material. I recorded my heartbeat with an iPhone, which was surprisingly easy to do. For the reader who is interested in doing so, all that is required is to take the phone out of any case it may be in, press it firmly to the chest below the collarbone and near the sternum, and take a voice memo. The voice memo can then be adjusted using EQ and compression tools to get the particular sound necessary for the piece. I intentionally began with the heartbeat slower, and accelerated it to create a sense of momentum and energy carrying both excitement and anxiety.

I recorded myself playing resonant chords from the first piece of music that I wrote for an ensemble in my MFA program in 2017, called “Love, Admonition, Sympathy.” (I will explain a little more about my reasons for including that piece when I discuss movement two). I chose to remove the attack of the sound in Logic, my digital audio workstation, so that only the resonance would remain, and add significant reverb, so that the piano would create almost a sense of floating for the listener. To further connect moments of time, I recorded the chords on the same Story and Clark piano I played as a child, which I re-inherited when my uncle moved houses last year. I also gathered the archival recordings of the MFA ensemble piece; violin, cello, piano and my voice.

In her process of downsizing, my mother had given me her harp, and I recorded myself bowing the lowest string, tuned down, to both include my mother and add bass resonance to the composition. I also recorded bowed tremolo on the tamburica, an instrument that comes from Croatia, for my paternal grandmother. These ancestrally connected sounds formed the cocoon for the opening movement, “Chambered.”

The first movement of the piece intends to create a space of maternal resonance into which to welcome my children, each of whom are also included sonically in the piece. For “Chambered,” I asked my younger daughter to tap her finger on the windowsill, and processed that sound until it sounded like the doppler of a baby’s heartbeat in utero. The movement begins with resonance, and then I recorded and included myself reading the words that inspired the setting for the backbone of the second movement:

Therefore I dare reveal my private woe / The secret blots of my imperfect heart
Nor strive to find nor swell mine own desert / Nor beautify nor hide, for this I know:
That even as I am, thou art.²⁹¹

These words are from the poem “Sympathy,” by Emma Lazarus, the American poet who wrote the verse on the base of the Statue of Liberty. When I set her poem as part of the first piece I wrote for my MFA in Music Composition, my intention was to make a piece that was both deeply emotional and also a serious piece of art music; coming into that program, I had a desire to prove myself as a serious and legitimate composer that I hope the reader will understand, given the context of the previous chapters of this dissertation. At the time, I felt the piece was not successful, but in retrospect, I am able to appreciate it and perceive its beauty. I included it in this composition for several reasons that are both therapeutic and musical. Including the piece further

²⁹¹ Emma Lazarus, “Sympathy,” in *The Poems of Emma Lazarus*, vol. 1, Project Gutenberg e-book no. 3295, originally released June 1, 2002, last updated November 20, 2024.

strengthens the artistic pathway of transmitting compassion to myself by validating that composition from my vantage point now. It also gives the rest of the piece a tonal and harmonic structure to rest on — I use the same harmony to underpin the first and second movements, and it comes in and out of the third movement, interwoven with more Jazz-based harmonic gestures. Lazarus' words themselves also express what the piece is doing. I am daring to express my “private woe.” “Even as I am,” so are you: I imagine that many people who listen to this piece may recognize elements of their own experiences with isolation, disconnection and sadness. Putting myself in the position of listener as well as composer, for me, hearing this would communicate at a level that is deeper or broader than verbalization that my experiences with PPD could and did contribute beauty, in art and in my life. It would be possible to communicate that basic idea verbally, as I have just done, but there is knowledge contained in the piece of music that is different than what is just winnowed down to the words. As in “The Artistic Turn,” there is a tacit knowledge that is not able to be fully contained in verbalization.²⁹²

The chamber of the first movement leads into the second movement at 03:24, titled “Little Neck Soundwalk” in an homage to Hildegard Westerkamp. Westerkamp, a Canadian composer and sound ecologist, created recorded ‘soundwalks:’ layered acoustic compositions that are like guided attention experiences through the sounds of a place, with Westerkamp’s voice as guide.²⁹³ Here I used the sounds of the wind, the train and the rain as a base, and incorporated the live recording of my performance of “Love. Admonition. Sympathy.” from 2017. I recorded myself reading from my journal in the spring of 2005, the most difficult point of my first

²⁹²

²⁹³ For more information about Westerkamp and to listen to her work, the reader can visit <https://www.hildegardwesterkamp.ca/bio/>

experience with postpartum depression, and included a recording of me and my oldest daughter in which she has a small but delightful temper tantrum (I am not writing that sarcastically; I actually think that tantrum is delightful and funny in retrospect). I connected that moment with audio from a section of my video journal in the winter of 2006, after I had written and recorded my first original album, as another symbolic transmission of hope and accomplishment backwards through time. This soundscape also creates an embodied experience for the listener and for myself-as-listener; the time of loneliness becomes like an art object.

To transition between the second and third movements, I used the sound of wind: multiple layers of loud, scouring wind. This wind is intended to be a force of nature, as motherhood is a force of nature. My wind is overwhelming and almost wipes out everything with its stormy power. The reader may be aware of the idiom “there is no way out but through;” I had to go through that overwhelming time to get out of it, and I intend take the listener through with the wind. Here again, the piece communicates an embodied knowledge to a human being who has experienced intense wind that is different than what would be communicated by verbalizing the idea.

The third movement, “Heaven Is,” begins at 07:56 with a gentle spring rain. The worst part of the storm is past, and now fertile blooms of creativity (and children) can grow. The bedrock of this part of the piece is a walking poem I spontaneously vocally ‘wrote’ and dictated into a voice memo when my younger children were about two and a half called “heaven is.” I had come through the worst of my second bout of postpartum depression. I was remembering, as the reader may remember from Chapter 5, that I had thought “this is someone’s idea of heaven, but it’s not mine,” walking around in Little Neck all those years ago. At the time I recorded my

walking poem, I had the thought that heaven was all the mixture of good and bad in this life, and that it was all beautiful, so I spoke my thoughts into my phone as I walked.

That recording was almost unusably noisy, so after a few attempts to clean it up, I re-recorded the poem, but chose to include a small snippet of it in which a woman on the street asked me for directions. The interaction between me and the woman felt to me like a demonstration of feeling a renewed ability to engage cheerfully with the world that had been missing during my period of PPD. For compositional symmetry, I included the harp from the first movement, but created a harmonic shift at 11:12 by bringing all the musical elements down a semitone.

The reader may remember that I wanted to include all of my children in this piece — my son plays the saxophone now, and so I asked him to record an improvisation. I added his improvisation to a recording of my colleagues playing upright bass and drums from a composition I wrote for my album *Jazz for the End of the World* (2020), called “Goodbye Paris.” Combining those elements symbolically transformed my son and me into the jazz on the radio that sustained me during my first bout with PPD and allowed me to artistically directly connect the time between then and now. For further symmetry, I asked him to play the melody line of “therefore I dare reveal my private woe,” from the first movement. The last element I included was a recording of my grandmother’s voice saying the word “heaven,” processed so that it is mostly the echo and reverberation of her voice placed above the listener. My “yeah” at the end of the piece is an affirmation of the value of everything contained within the experience: love, sadness, creation, isolation, growth, and their value to me now.

I used the digital audio workstation Logic Pro X to arrange, sequence and mix these recordings into my composition. Throughout the piece, I used processing including QRS reverb and Dolby Atmos 7:1:4 spatial processing (downmixed to a binaural render in the version linked in this document) to create a varied sense of spatialization for the listener; sometimes close and intimate and sometimes echoing and expansive. To both evoke maternal gestation and the feeling of being precisely embodied or incarnated, I wanted to make a round space with a center for the listener to inhabit in all movements. In so doing, I hope to further center the maternal experience in this artistic communication about it, and encourage further empirical research to do so as well.

I have been referencing ‘the listener’ throughout this chapter, and I would like to conclude it by saying that the listener is both any potential audience for the work, and also me. In the process of creating this piece, I adjusted and listened until the piece was the experience that I wanted to hear, a bittersweet but beautiful journey of transformation from gestation, through the wind, to the spring rains at the end. Listening to my own piece was healing for me, and brought me a deep sense of gratitude. In my discussion of Artistic Practice as Research in Chapter 4, I discussed several theoretical models, including Darla Crispin’s,²⁹⁴ that do not obligate the artist to communicate their research in any other way besides the artistic piece itself. Nevertheless, I hope that for the reader, this explanation of my practice has helped to further communicate the results of my long and interdisciplinary research into the therapeutic benefits of music creation to the creator of that music.

²⁹⁴ Crispin, “Artistic Research and Music Scholarship.”

Chapter 8: Conclusions

In keeping with the interdisciplinary nature of this dissertation, the conclusions I have come to are also interdisciplinary. For clarity and flow, I have divided them up into domains that roughly reflect the divisions in the introduction and my chapter divisions throughout, although there will be some cross-pollination between and among domains.

This cross-pollination itself speaks to a feature of human endeavor that has become more apparent to me through the research and writing of this dissertation, which is that the interconnectedness between domains of human work and experience is important to foreground when we are attempting to analyze and generate solutions to human problems. Much like the interaction of sound waves, which can boost and attenuate each other simultaneously, multiple factors interact to contribute to amplify or reduce facets of any given human experience, but in particular, personal experiences involving mood, affect and emotion. From a traditional scientific viewpoint, these interconnected factors would be seen as confounding, meaning, we should attempt to isolate them when we are attempting to determine the root cause of an effect on a particular human or group of humans. From the vantage points of Artistic Practice as Research and autoethnography, there is an intercausal back and forth between and among many factors, as well as the subjects and researchers themselves. Both perspectives are valuable to keep in balance when designing research involving human subjects. In *The Artistic Turn*, describing the fundamental similarities between scientific and artistic research, the authors say “ Both have to start from the constraints of the world and the constraints of the human being; both have to cope with cultural context and prevailing conventions. Their transformational models and interactions

are similar, the heuristic processes are richly evident in both of them. Their deconstruction of the raw material of the world is similar.”²⁹⁵

Further, I believe the siloing of different domains of human work prevents us from seeing connections that could help us in our search for solutions. Interdisciplinary work, when conducted thoughtfully, can be a way to counteract this siloing. In this dissertation I examined the work of neuropsychologists, sociologists, pedagogues, artists and musicians, nurses and doctors, and put those works in conversation with one another. Domain-specific jargon and assumptions can make it difficult to translate “apples into oranges,” and so my first main conclusion, and advice to the researchers of the world, is to communicate clearly and simply wherever possible, so that research can be understood by as many people as possible, regardless of their background or domain. Many of our human problems are exacerbated, if not caused, by us talking past each other.

Postpartum Depression and Neurology

Although mothers all over the world, from all ages, backgrounds, countries and circumstances experience postpartum depression, it still does not have a dedicated and specific diagnosis or definition in either the DSM-V or the ICD, the two most commonly used and reputedly regarded diagnostic manuals for clinicians worldwide (refer to Chapter 1). This oversight leads to confusion in mothers and diagnosticians alike, and almost certainly to underdiagnosis of the problem. A dedicated definition and diagnosis for each postpartum affective disorder in subsequent editions of the DSM and the ICD would be a worthy goal for the

²⁹⁵ Coessens et al, *The Artistic Turn*, 40.

next round of revisions for both manuals, and would likely greatly assist in improving outcomes for mothers with PPD and their families.

Furthermore, it is clear that neurological activity in postpartum mothers differs from that of the general population even in the absence of an affective disorder (discussed in Chapter 2). Training in the specific changes that happen in the postpartum brain would benefit all providers who work with postpartum moms, particularly clinicians who are making treatment recommendations. If, as I have observed in the literature, there is a mismatch between amygdala activation as a measure correlated with depression for postpartum mothers, and measures of efficacy of treatment medications like SSRIs, further research into the efficacy and potential mechanisms of action of these medicines with this particular population would seem to be advisable. I am not a clinician, so that determination is not and certainly should not be up to me. Still, I hope that this dissertation will be part of a larger encouragement to the clinical world to conduct specific and robust research into the postpartum brain and how it responds to all treatments that are commonly recommended.

As also discussed in Chapter 2, Randomized Controlled Trials (RCTs) are the gold standard for measuring the effects of a therapeutic intervention. RCTs allow for the effect size or potency to be measured with more quantitative accuracy, and also help researchers in their attempts to differentiate between effects that may be caused by other confounding factors — of which, as I mentioned earlier, there are so many in any human research — or effects that are genuinely correlated with the intervention itself. I encourage further research into all therapies for postpartum depression to include RCTs, as well as longitudinal studies to measure the persistence of any effects. The use of RCTs and longitudinal studies should be combined with

robust qualitative data gathering about the subjective experiences of the mothers themselves for the most thorough possible analysis.

Music Therapy

As explored in Chapter 2, music-based therapies in general have shown promise for the treatment of PPD. However, in the assessment of these therapies, a lack of common terminology leads to a lack of clarity in comparing and judging the successes of outcomes. Agreeing upon and using common terms and measurements in the design of music therapy studies and treatment modalities would help researchers to compare the relative efficacies of treatments. Neurologic Music Therapy as a discipline alleviates some of this confusion, because NMT researchers use common terms. Embedded in NMT study design is a harnessing of neurological processes to accomplish therapeutic effects, and a recording of data that allows the efficacy of NMT treatments to be more easily assessed and understood.

Case Study Results

The self-reported experience of my study participant was very positive. D. reported feeling happy, proud and competent about her musical work, and including her voice and self-described experience in this dissertation is valuable in centering the maternal experience in research about PPD. In terms of her self-reported measurement of symptoms of postpartum depression, her responses to the FACES task reflected a small quantitative improvement, but also a persistence of what could be a negative attentional bias. Her EPDS responses reflected a

significant improvement, but as this was a single-participant study, there is no way to claim that this improvement is correlated with the intervention. My study participant was very motivated to participate in the study, and while that was wonderful for me as a researcher, it may be something of a confounding factor when it comes to the results I observed. Repeating this study with a larger cohort of mothers, and implementing the study with a control group of mothers only engaging in conventional therapies, would let researchers see if these results are replicable. A longitudinal study or follow-up survey after the passage of a designated amount of time would allow researchers to see if the results were persistent.

I chose music creation for my intervention, first, because I had subjectively experienced its benefits in the form of a heightened feeling of my own self-efficacy and ability to regulate emotions and experiences, and second, because the research I encountered suggests that music creation and composition promote neural connectivity, rather than just activation (Chapter 2). The research I reviewed for this dissertation also suggests that inquiry into whether amygdala *disconnection* rather than *hypoactivation* may be a mechanism underlying symptoms in mothers who experience PPD would be a valuable research direction. For other disorders that are associated with a lack of neural connectivity, music creation could be a fruitful path for researching and designing new therapies.

Teaching, Music and Society

Powerful though it may be, music as a therapeutic tool is of no use to anyone who feels like they can't make it. In order for us to create conditions more favorable to people creating

their own music, in my opinion, we should increase awareness about how the ways in which we teach, think about, and talk about creative endeavor may negatively impact people's ability to create. If my experience and research are any guide, embedding growth mindset in an active and intentional way into our pedagogies of teaching music (and really all creative endeavors) will help to create these conditions. When people understand that music and creation are work that can be done in small steps, iterated, changed, discarded and restarted, rather than magic flights of inspiration, they are more able to create, and reap the benefits of creation. Furthermore, I think this feeling of creative agency can be deeply valuable for all domains of human endeavor. People who feel like they can change their own creative work may be more likely to feel like they can make a positive change in the wider world.

Artistic Practice as Research

Artistic practice as research offers many important contributions to the advancement of human knowledge. It illuminates things about the general culture of research that may inhibit our ability to get good information from it, like institutional or individual priorities, and how those priorities drive what is looked for, found, and known. To put it another way, domains have default points of view that are important to consider when designing and analyzing research, and APAR can shed light on those points of view. APAR generates insights, and if the art is the output, it communicates those insights in a specifically human experiential modality that may allow for the results and meaning to be absorbed in a more impactful way to the creator, listener, viewer, or experiencer of the art product. Different modes of communication work for different

people, and the type of understanding that can be generated by experiencing art can be deeply valuable, not only in an intellectual way, but also in an embodied, emotional or intuitive way.

Autoethnography similarly sheds light on the nature and culture of research by foregrounding the individual and their perspective in the research itself. This is not a small matter: the human tendency to think of practices as ‘normal’ or ‘correct,’ when they are just things we are habituated to (like lab coats) can often obscure the path to new discoveries. Furthermore, what researcher Arthur Boecher refers to as “the academic dialect,”²⁹⁶ that is, the dense and jargon-heavy style in which much research is communicated out often obscures the information being communicated. It is very unlikely that any human research or findings are fully neutral or impersonal, and so maintaining an awareness of what shapes our perspectives is probably the best we can do to make sure our research findings are as useful as possible. Thoughtful and compassionate self-reflection, on individual, institutional, and societal levels, will hopefully help us develop a better understanding of why, how and what we learn and know, in the service of helping to make the world a better place for each of us and all of us.

To end on a personal note, my process of Artistic Practice as Research over the past twenty-one years, but in particular through the arc of creating “Carrying,” was deeply meaningful and valuable to me. The process of creation allowed me to shape my own experiences with PPD as something valuable to me, but separate from myself. Symbolically, creating this music helped me to transmit tremendous compassion to my past self and her struggles in a way that was very healing. The inclusion of my children and maternal family members through symbolic compositional choices was deeply fulfilling, and listening to the

²⁹⁶ Arthur P. Bochner and Carolyn Ellis, *Evocative Autoethnography: Writing Lives and Telling Stories* (New York: Routledge, 2016), 79.

piece with them was a very resonant experience, for which I am grateful to have had the opportunity. I hope that by conducting this study and writing this dissertation that I have increased the possibility for more mothers to have similar opportunities in the future.

Bibliography

- American Academy of Arts and Sciences. *Art for Life's Sake: The Case for Arts Education*. Cambridge, MA: American Academy of Arts and Sciences (2021). <https://www.amacad.org/sites/default/files/publication/downloads/2021-Art-for-Lifes-Sake.pdf>.
- Arnone, Danilo. "Functional MRI Findings, Pharmacological Treatment in Major Depression and Clinical Response." *Progress in Neuro-Psychopharmacology & Biological Psychiatry* (England) 91 (April 2019): 34. <https://doi.org/10.1016/j.pnpbp.2018.08.004>.
- Athanasopoulos, George, Tuomas Eerola, Imre Lahdelma, and Maximos Kaliakatsos-Papakostas. "Harmonic Organisation Conveys Both Universal and Culture-Specific Cues for Emotional Expression in Music." *PLOS ONE* 16, no. 1 (2021): e0244964. <https://doi.org/10.1371/journal.pone.0244964>.
- Atkinson, Lauren, Anjali Sankar, Tracey M. Adams, and Cynthia H. Y. Fu. "Recent Advances in Neuroimaging of Mood Disorders: Structural and Functional Neural Correlates of Depression, Changes with Therapy, and Potential for Clinical Biomarkers." *Current Treatment Options in Psychiatry* 1, no. 3 (2014): 278–293. <https://doi.org/10.1007/s40501-014-0022-5>.
- Banti, Susanna, Mauro Mauri, Annalisa Oppo, Chiara Borri, Cristina Rambelli, Daniele Ramacciotti, Maria S. Montagnani, Valeria Camilleri, Sonia Cortopassi, Paola Rucci, and Giovanni B. Cassano. "From the Third Month of Pregnancy to 1 Year Postpartum: Prevalence, Incidence, Recurrence, and New Onset of Depression; Results from the Perinatal Depression–Research & Screening Unit Study." *Comprehensive Psychiatry* 52, no. 4 (2011): 343–351. <https://doi.org/10.1016/j.comppsy.2010.08.003>
- Bashwiler, David M., Donna K. Bacon, Christopher J. Wertz, Ranee A. Flores, Muhammad O. Chohan, and Rex E. Jung. "Resting state functional connectivity underlying musical creativity," *NeuroImage*, Volume 218 (2020), 116940, ISSN 1053-8119, <https://doi.org/10.1016/j.neuroimage.2020.116940>.
- Bauman, Brenda L., Jean Y. Ko, Shanna Cox, et al. "Vital Signs: Postpartum Depressive Symptoms and Provider Discussions About Perinatal Depression — United States, 2018." *Morbidity and Mortality Weekly Report* 69, no. 19 (2020): 575–581. <https://doi.org/10.15585/mmwr.mm6919a2>.
- Beaty, Roger E. "The Neuroscience of Musical Improvisation." *Neuroscience & Biobehavioral Reviews* 51 (2015): 108–117. <https://doi.org/10.1016/j.neubiorev.2015.01.004>.
- Beck, Cheryl Tatano. "Postpartum Depression: It Isn't Just the Blues." *American Journal of Nursing* 106, no. 5 (2006): 40–50. <https://doi.org/10.1097/00000446-200605000-00020>.
- Beck, Judith S. *Cognitive Behavior Therapy: Basics and Beyond*. 2nd ed. New York: Guilford Press, 2011.

- Beltratti, Carola, Antonio Bertolotto, Paola Valentino, Federica Frezet, and Luca Marozio. "Post-Partum sNFL Increase Suggests Pregnancy-Induced Neuroplasticity." *European Journal of Obstetrics & Gynecology and Reproductive Biology* 313 (2025): article 114374. Conference abstract. <https://doi.org/10.1016/j.ejogrb.2025.114374>.
- Bennett, Richard, and Joseph E. Oliver. *Acceptance and Commitment Therapy: 100 Key Points and Techniques*. 1st ed. London: Routledge, 2019. <https://doi.org/10.4324/9781351056144>.
- Bochner, Arthur P., and Carolyn Ellis. *Evocative Autoethnography: Writing Lives and Telling Stories*. New York: Routledge, 2016.
- Borgdorff, Henk. *The Debate on Research in the Arts. Sensuous Knowledge* 2. Bergen: Bergen National Academy of the Arts, 2006.
- Brattico, Elvira, Brigitte Bogert, Vinoo Alluri, Mari Tervaniemi, Tuomas Eerola, and Thomas Jacobsen. "It's Sad but I Like It: The Neural Dissociation between Musical Emotions and Liking in Experts and Laypersons." *Frontiers in Human Neuroscience* 9 (2016): article 676. <https://doi.org/10.3389/fnhum.2015.00676>.
- Broadfoot, Marla. "The Mother of Depressions: Postpartum Depression Is a Leading Cause of Death among New Mothers; A New Type of Drug Offers Better, Faster Treatment." *Scientific American* 333, no. 5 (December 2025): 52. <https://doi.org/10.1038/scientificamerican122025-3eWmLIOJ0KdJcY1OF8MSRy>.
- Bauman, Brenda L. et al. "Vital Signs: Postpartum Depressive Symptoms and Provider Discussions About Perinatal Depression — United States, 2018," *Morbidity and Mortality Weekly Report* 69, no. 19 (2020): 575–581, <https://doi.org/10.15585/mmwr.mm6919a2>.
- Bukowska, Agnieszka A., Piotr Krężalek, Ewa Mirek, Piotr Bujas, and Anna Marchewka. "Neurologic Music Therapy Training for Mobility and Stability Rehabilitation with Parkinson's Disease: A Pilot Study." *Frontiers in Human Neuroscience* 9 (2016): article 710. <https://doi.org/10.3389/fnhum.2015.00710>.
- Burnette, Jeni L., Joseph Billingsley, George C. Banks, Laura E. Knouse, Crystal L. Hoyt, Jeffrey M. Pollack, and Stefanie Simon. "A Systematic Review and Meta-Analysis of Growth Mindset Interventions: For Whom, How, and Why Might Such Interventions Work?" *Psychological Bulletin* 149, nos. 3–4 (2023): 174–205. <https://doi.org/10.1037/bul0000368>.
- Carolan, Mary, Maebh Barry, Mary Gamble, Kathleen Turner, and Óscar Mascareñas. "Experiences of Pregnant Women Attending a Lullaby Programme in Limerick, Ireland: A Qualitative Study." *Midwifery* 28, no. 3 (2012): 321–328. <https://doi.org/10.1016/j.midw.2011.04.009>.
- Chabrol, Henri, Frédérique Teissedre, Jane Armitage, Marine Danel, and Vera Walburg. "Acceptability of Psychotherapy and Antidepressants for Postnatal Depression among Newly Delivered Mothers." *Journal of Reproductive and Infant Psychology* 22, no. 1 (2004): 5–12. <https://doi.org/10.1080/02646830310001643094>.

- Chenette, Timothy K. "Creativity in the College Music Classroom: Guidelines for Effective Integration." *College Music Symposium* 56 (2016). <https://www.jstor.org/stable/26574420>.
- Chin, Kathleen, Amelia Wendt, Ian M. Bennett, and Amritha Bhat. "Suicide and Maternal Mortality." *Current Psychiatry Reports* 24, no. 4 (2022): 239–275. <https://doi.org/10.1007/s11920-022-01334-3>.
- Cleveland Clinic. "Gray Matter." Last updated February 22, 2026. <https://my.clevelandclinic.org/health/body/24831-grey-matter>.
- Coessens, Kathleen, Darla Crispin, and Anne Douglas. *The Artistic Turn: A Manifesto*. Leuven University Press, 2009.
- Corey, Kristen, Ronit Fallek, and Maya Benattar. "Bedside Music Therapy for Women During Antepartum and Postpartum Hospitalization." *MCN: The American Journal of Maternal/Child Nursing* 44, no. 5 (2019): 277–283. <https://doi.org/10.1097/NMC.0000000000000557>.
- Cox, John L., Jeni M. Holden, and Ruth Sagovsky. "Detection of Postnatal Depression: Development of the 10-Item Edinburgh Postnatal Depression Scale." *British Journal of Psychiatry* 150, no. 6 (1987): 782–786. <https://doi.org/10.1192/bjp.150.6.782>.
- Crispin, Darla. "Artistic Research and Music Scholarship: Musings and Models from a Continental European Perspective." In *Artistic Practice as Research in Music: Theory, Criticism, Practice*, edited by Mine Doğanatan-Dack, 53–72. Surrey: Ashgate, 2015.
- Cutietta, Robert A. "The Musical Elements: Who Said They're Right?" *Music Educators Journal* 79, no. 9 (1993): 50–52.
- Crispin, Darla. "Artistic Research and Music Scholarship: Musings and Models from a Continental European Perspective." In *Artistic Practice as Research in Music: Theory, Criticism, Practice*, edited by Mine Doğanatan-Dack, 53–72. Farnham: Ashgate, 2015.
- Csikszentmihalyi, Mihaly. *Flow: The Psychology of Optimal Experience*. New York: Harper & Row, 1990.
- Csikszentmihalyi, Mihaly, and Rustin Wolfe. "New Conceptions and Research Approaches to Creativity: Implications of a Systems Perspective for Creativity in Education." In *The Systems Model of Creativity: The Collected Works of Mihaly Csikszentmihalyi*, edited by Mihaly Csikszentmihalyi, 161–184. Dordrecht: Springer, 2014. https://doi.org/10.1007/978-94-017-9085-7_10.
- da Mota, Pedro A., Henrique M. Fernandes, Ana T. Lourenço Queiroga, Elisabeth Stark, Jakub Vohryzek, Joana Cabral, Ole A. Heggli, Nuno Sousa, Gustavo Deco, Morten L. Kringelbach, and Peter Vuust. "Creativity in Music: The Brain Dynamics of Jazz Improvisation." *Annals of the New York Academy of Sciences* 1553 (2025): 350–362. <https://doi.org/10.1111/nyas.70042>.

- De Crescenzo, Franco, et al. "Selective Serotonin Reuptake Inhibitors (SSRIs) for Post-Partum Depression (PPD): A Systematic Review of Randomized Clinical Trials." *Journal of Affective Disorders* 152–154 (2014): 39–44. <https://doi.org/10.1016/j.jad.2013.09.019>.
- de l'Etoile, Shannon K. "The Effect of a Musical Mood Induction Procedure on Mood State-Dependent Word Retrieval." *The Journal of Music Therapy* (England) 39, no. 2 (2002): 145–60. <https://doi.org/10.1093/jmt/39.2.145>.
- de l'Etoile, Shannon K., Carolyn Dachinger, Joy Fairfield, and Linda Lathroum. "The Rational-Scientific Mediating Model (R-SMM): A Framework for Scientific Research in Music Therapy." *Music Therapy Perspectives* 30, no. 2 (2012): 130–140. <https://doi.org/10.1093/mtp/30.2.130>.
- de Oliveira, Rita F., Lysann Damisch, Ernst-Joachim Hossner, Raoul R. D. Oudejans, Markus Raab, Kirsten G. Volz, and A. Mark Williams. "The Bidirectional Links between Decision Making, Perception, and Action," in *Mind and Motion: The Bidirectional Link between Thought and Action*, ed. Markus Raab, Joseph G. Johnson, and Hauke R. Heekeren, *Progress in Brain Research* 174 (Amsterdam: Elsevier, 2009), 85–93, [https://doi.org/10.1016/S0079-6123\(09\)01308-9](https://doi.org/10.1016/S0079-6123(09)01308-9)
- Dennis, Cindy-Lee, and Ellen D. Hodnett. "Psychosocial and Psychological Interventions for Treating Postpartum Depression." *Cochrane Database of Systematic Reviews* (Chichester, UK) 2010, no. 1 (2007): CD006116. <https://doi.org/10.1002/14651858.CD006116.pub2>.
- Dimidjian, Sona, and Sherryl Goodman. "Nonpharmacologic Intervention and Prevention Strategies for Depression During Pregnancy and the Postpartum." *Clinical Obstetrics and Gynecology* 52, no. 3 (2009): 498–515. <https://doi.org/10.1097/GRF.0b013e3181b52da6>.
- Duan, Chang, Jennifer Cosgrove, and Kristina M. Deligiannidis. "Understanding Peripartum Depression through Neuroimaging: A Review of Structural and Functional Connectivity and Molecular Imaging Research." *Current Psychiatry Reports* 19, no. 10 (2017): article 70. <https://doi.org/10.1007/s11920-017-0824-4>.
- Duffy, Celia, and Stephen Broad. "Practising Research, Playing with Knowledge." In *Artistic Practice as Research in Music: Theory, Criticism, Practice*, edited by Mine Doğantan-Dack, 33–52. Farnham: Ashgate, 2015.
- Duque, Almudena, and Carmelo Vázquez. "Double Attention Bias for Positive and Negative Emotional Faces in Clinical Depression: Evidence from an Eye-Tracking Study." *Journal of Behavior Therapy and Experimental Psychiatry* 46 (2015): 107–114. <https://doi.org/10.1016/j.jbtep.2014.09.005>.
- Dweck, Carol S. *Mindset: The New Psychology of Success*. New York: Ballantine Books, 2007.
- Ebner, Natalie C., Michaela Riediger, and Ulman Lindenberger. "FACES—A Database of Facial Expressions in Young, Middle-Aged, and Older Women and Men: Development and

- Validation.” *Behavior Research Methods* 42, no. 1 (2010): 351–362. <https://doi.org/10.3758/BRM.42.1.351>.
- Edhborg, Maigun, Malin Friberg, Wendela Lundh, and Ann-Marie Widström. “‘Struggling with Life’: Narratives from Women with Signs of Postpartum Depression,” *Scandinavian Journal of Public Health* 33, no. 4 (2005): 261, <https://doi.org/10.1080/14034940510005725>.
- Ellis, Carolyn, Tony E. Adams, and Arthur P. Bochner, “Autoethnography: An Overview,” *Historical Social Research / Historische Sozialforschung* 36, no. 4 (138) (2011): 273–290, <http://www.jstor.org/stable/23032294>
- Faber, Adele, and Elaine Mazlish. *How to Talk So Kids Will Listen and Listen So Kids Will Talk*. 4th ed. London: Piccadilly Press, 2017.
- Fahey, Jenifer O., and Edmond Shenassa. “Understanding and Meeting the Needs of Women in the Postpartum Period: The Perinatal Maternal Health Promotion Model.” *Journal of Midwifery & Women’s Health* 58, no. 6 (2013): 613–621. <https://doi.org/10.1111/jmwh.12139>.
- Fancourt, Daisy, and Rosie Perkins. “Effect of Singing Interventions on Symptoms of Postnatal Depression: Three-Arm Randomised Controlled Trial.” *British Journal of Psychiatry* 212, no. 2 (2018): 119–121. <https://doi.org/10.1192/bjp.2017.29>.
- Frayling, Christopher. *Research in Art and Design. Royal College of Art Research Papers* 1, no. 1 (1993/94). London: Royal College of Art, 1993.
- Geddes, John R., Nick Freemantle, James Mason, Martin Eccles, and Julie Boynton. “Selective Serotonin Reuptake Inhibitors (SSRIs) versus Other Antidepressants for Depression.” *Cochrane Database of Systematic Reviews*, no. 4 (1999): CD001851. <https://doi.org/10.1002/14651858.CD001851>.
- Guille, Constance, Rachel Newman, Lisa D. Fryml, Carolyn K. Lifton, and C. Neill Epperson. “Management of Postpartum Depression.” *Journal of Midwifery & Women’s Health* 58, no. 6 (2013): 643–653. <https://doi.org/10.1111/jmwh.12104>.
- Hahn-Holbrook, Jennifer, Tia Cornwell-Hinrichs, and Itzel Anaya. “Economic and Health Predictors of National Postpartum Depression Prevalence: A Systematic Review, Meta-Analysis, and Meta-Regression of 291 Studies from 56 Countries.” *Frontiers in Psychiatry* 8 (2018): article 248. <https://doi.org/10.3389/fpsy.2017.00248>.
- Haim, Achikam, Candice Albin-Brooks, Michael Sherer, Elizabeth Mills, and Benedetta Leuner. “The Effects of Gestational Stress and Selective Serotonin Reuptake Inhibitor Antidepressant Treatment on Structural Plasticity in the Postpartum Brain: A Translational Model for Postpartum Depression.” *Hormones and Behavior* 77 (2016): 124–131. <https://doi.org/10.1016/j.yhbeh.2015.05.005>.

- Hakimi, Sevil, Khadije Hajizadeh, Robab Hasanzade, and Minoo Ranjbar. "A Systematic Review and Meta-Analysis of the Effects of Music Therapy on Postpartum Anxiety and Pain Levels." *Journal of Caring Sciences* 10, no. 4 (2021): 230–237. <https://doi.org/10.34172/jcs.2021.033>.
- Hale, Andreas. "'To Pimp A Butterfly': Kendrick Lamar Shares History." *GRAMMY.com*. May 15, 2017. <https://www.grammy.com/news/aoty-to-pimp-a-butterfly-oral-history>.
- Hamilton, Laura S., Brian M. Stecher, and Kun Yuan. *Standards-Based Reform in the United States: History, Research, and Future Directions*. Santa Monica, CA: RAND Corporation, 2008.
- Hampshire College, "What Is Research?," accessed January 10, 2026, <https://www.hampshire.edu/offices/office-dean-faculty/irb-research-human-subjects/irb-general-information/what-research>.
- Hariri, Ahmad R., Alessandro Tessitore, Venkata S. Mattay, Francesco Fera, and Daniel R. Weinberger. "The Amygdala Response to Emotional Stimuli: A Comparison of Faces and Scenes." *NeuroImage* 17, no. 1 (2002): 317–323. <https://doi.org/10.1006/nimg.2002.1179>.
- Hennessey, Sarah, Isolde Malmberg, Franz Niermann, and Adri de Vugt. "meNet and EAS Learning Outcomes: Music Teacher Training for Specialists and Generalists." *EAS Learning Outcomes Platform*, 259–281. Accessed May 2, 2026. <https://eas-music.org/wp-content/uploads/2015/07/learning-outcomes-generalists-specialists1.pdf>.
- Herbert, James. "Back on to the Agenda," in *Creating the AHRC: An Arts and Humanities Research Council for the United Kingdom in the Twenty-First Century* (London: British Academy, 2008), 8–14, <https://doi.org/10.5871/bacad/9780197264294.003.0002>.
- Higher Education Funding Council for England, *Research Excellence Framework Impact Pilot Exercise: Guidance to Expert Panels* (HEFCE, March 30, 2010), 7, https://2014.ref.ac.uk/media/ref/content/background/impact/guidance_panels.pdf
- Horáková, Anna, Hana Němcová, Pavel Mohr, and Antonín Šebela. "Structural, Functional, and Metabolic Signatures of Postpartum Depression: A Systematic Review." *Frontiers in Psychiatry* 13 (2022): article 1044995. <https://doi.org/10.3389/fpsy.2022.1044995>.
- Jones, Jonathan. "The Guardian Profile: Sir Christopher Frayling." *The Guardian*, December 12, 2003. <https://www.theguardian.com/artanddesign/2003/dec/12/artspolicy.artsfunding>.
- Kendall-Tackett, Kathleen. *Depression in New Mothers: Causes, Consequences, and Treatment Alternatives*. New York: Routledge, 2016.
- Kim, Pilyoung, Lane Strathearn, and James E. Swain. "The Maternal Brain and Its Plasticity in Humans." *Hormones and Behavior* 77 (2016): 113–123. <https://doi.org/10.1016/j.yhbeh.2015.08.001>.

- Kirkpatrick, Ciera E., and Sungkyoung Lee. "Idealized Motherhood on Social Media: Effects of Mothers' Social Comparison Orientation and Self-Esteem on Motherhood Social Comparisons." *Journal of Broadcasting & Electronic Media* 68, no. 2 (2024): 284–304. <https://doi.org/10.1080/08838151.2024.2324152>.
- Klein, Alyson. "No Child Left Behind: An Overview." *Education Week*, April 10, 2015. <https://www.edweek.org/policy-politics/no-child-left-behind-an-overview/2015/04>.
- Klug, Marie, Verena Enneking, Tabea Borgers, et al. "Persistence of Amygdala Hyperactivity to Subliminal Negative Emotion Processing in the Long-Term Course of Depression." *Molecular Psychiatry* 29 (2024): 1501–1509. <https://doi.org/10.1038/s41380-024-02429-4>.
- Knudson-Martin, Carmen, and Randi Silverstein. "Suffering in Silence: A Qualitative Meta-Data-Analysis of Postpartum Depression." *Journal of Marital and Family Therapy* 35, no. 2 (2009): 145–158. <https://doi.org/10.1111/j.1752-0606.2009.00112.x>.
- Koenigs, Michael, and Jordan Grafman. "The Functional Neuroanatomy of Depression: Distinct Roles for Ventromedial and Dorsolateral Prefrontal Cortex." *Behavioural Brain Research* 201, no. 2 (2009): 239–243. <https://doi.org/10.1016/j.bbr.2009.03.004>.
- Laor, Lia. "In Music Nothing Is Worse Than Playing Wrong Notes: Nineteenth-Century Mechanistic Paradigm of Piano Pedagogy." *Journal of Historical Research in Music Education* 38, no. 1 (2016): 5–24. <https://doi.org/10.1177/1536600616662540>.
- Lazarus, Emma. "Sympathy." In *The Poems of Emma Lazarus*, vol. 1. Originally published 1889 by Houghton, Mifflin and Company. Project Gutenberg e-book no. 3295, released June 1, 2002, updated November 20, 2024. <https://www.gutenberg.org/ebooks/3295>
- LeMieux, Sarah. "Everyone Should Feel Welcome." *Journal of the International Alliance for Women in Music*, 26, no. 2 (2020): 23.
- Leppänen, Jukka M., Maarten Milders, J. Stephen Bell, Emma Terriere, and Jari K. Hietanen. "Depression Biases the Recognition of Emotionally Neutral Faces." *Psychiatry Research* 128, no. 2 (2004): 123–133. <https://doi.org/10.1016/j.psychres.2004.05.020>.
- Libet, Benjamin, Curtis A. Gleason, Elwood W. Wright, and Dennis K. Pearl, "Time of Conscious Intention to Act in Relation to Onset of Cerebral Activity (Readiness-Potential): The Unconscious Initiation of a Freely Voluntary Act," *Brain* 106, no. 3 (1983): 623–642, <https://doi.org/10.1093/brain/106.3.623>.
- Lorenz, Tierney K., Hu Cheng, and Julia R. Heiman. "Neural Correlates of Emotion Processing Comparing Antidepressants and Exogenous Oxytocin in Postpartum Depressed Women: An Exploratory Study." *PLOS ONE* 14, no. 5 (2019): e0217764. <https://doi.org/10.1371/journal.pone.0217764>.

- Lu, Jie, Hua Yang, Xiaoyu Zhang, et al. “The Brain Functional State of Music Creation: An fMRI Study of Composers.” *Scientific Reports* 5 (2015): article 12277. <https://doi.org/10.1038/srep12277>.
- Ma, Rui, Lin Feng, Xiaoli Guo, Shanshan Guo, Shuyu Long, Hua Yang, and Jing Lu. “Effects of Music Composition on Structural and Functional Connectivity in the Orbitofrontal Cortex.” *Brain-Apparatus Communication: A Journal of Bacomics* 3, no. 1 (2024): article 2346498. <https://doi.org/10.1080/27706710.2024.2346498>.
- Mastnak, Wolfgang. “Perinatal Music Therapy and Antenatal Music Classes: Principles, Mechanisms, and Benefits.” *Journal of Perinatal Education* 25, no. 3 (2016): 184–192. <https://doi.org/10.1891/1058-1243.25.3.184>.
- McDonagh, Marian S., Annette Matthews, Carrie Phillipi, Jillian Romm, Kim Peterson, Sujata Thakurta, and Jeanne-Marie Guise. “Depression Drug Treatment Outcomes in Pregnancy and the Postpartum Period: A Systematic Review and Meta-Analysis.” *Obstetrics & Gynecology* 124, no. 3 (2014): 526–534. <https://doi.org/10.1097/AOG.0000000000000410>.
- Melón, Laverne C., Ryan Hammond, Megan Lewis, and Jamie Maguire. “A Novel, Synthetic, Neuroactive Steroid Is Effective at Decreasing Depression-Like Behaviors and Improving Maternal Care in Preclinical Models of Postpartum Depression.” *Frontiers in Endocrinology* 9 (2018): article 703. <https://doi.org/10.3389/fendo.2018.00703>.
- Meltzer-Brody, Samantha, Helen Colquhoun, Robert Riesenber, et al. “Brexanolone Injection in Post-Partum Depression: Two Multicentre, Double-Blind, Randomised, Placebo-Controlled, Phase 3 Trials.” *The Lancet* 392, no. 10152 (2018): 1058–1070. [https://doi.org/10.1016/S0140-6736\(18\)31551-4](https://doi.org/10.1016/S0140-6736(18)31551-4).
- Mennen, Anne C., Kenneth A. Norman, and Nicholas B. Turk-Browne. “Attentional Bias in Depression: Understanding Mechanisms to Improve Training and Treatment.” *Current Opinion in Psychology* 29 (2019): 266–273. <https://doi.org/10.1016/j.copsyc.2019.07.036>.
- Merkatz, Ruth B., Robert Temple, Solomon Sobel, Karyn Feiden, David A. Kessler, and the Working Group on Women in Clinical Trials. “Women in Clinical Trials of New Drugs: A Change in Food and Drug Administration Policy.” *New England Journal of Medicine* 329, no. 4 (1993): 292–296. <https://doi.org/10.1056/NEJM199307223290429>.
- Miller, Sammy. “We’re Teaching Music to Kids All Wrong.” *New York Times*, September 23, 2023. <https://www.nytimes.com/2023/09/23/opinion/teach-music-better.html>.
- Nash, Graham. *Off the Record: Songwriters on Songwriting*. Kansas City: Andrews McMeel Publishing, 2002.
- National Coalition for Core Arts Standards. *2014 Music Standards: Composition/Theory Strand*. Reston, VA: National Association for Music Education, 2014. <https://nafme.org/wp-content/uploads/2023/04/2014-Music-Standards-Composition-Theory-Strand.pdf>.

- Nonacs, Ruta. “Maternal Self-Efficacy as a Risk Factor for Postpartum Depression and Anxiety.” *MGH Center for Women’s Mental Health*. April 13, 2021. <https://womensmentalhealth.org/posts/maternal-self-efficacy-as-a-risk-factor-for-postpartum-depression-and-anxiety/>.
- November, Nancy. “Phenomenology, Practice-Led Research, and Applied Musicology.” In *The Routledge Companion to Applied Musicology*, edited by Chris Dromey, 55–62. Routledge, 2023. <https://doi.org/10.4324/9781003042983>.
- Osborne, Lauren M. “Recognizing and Managing Postpartum Psychosis: A Clinical Guide for Obstetric Providers.” *Obstetrics and Gynecology Clinics of North America* 45, no. 3 (2018): 455–468. <https://doi.org/10.1016/j.ogc.2018.04.005>.
- Pando-Naude, Victor, Agata Patyczek, Leonardo Bonetti, and Peter Vuust. “An ALE Meta-Analytic Review of Top-Down and Bottom-Up Processing of Music in the Brain.” *Scientific Reports* 11, no. 1 (2021): 20813. <https://doi.org/10.1038/s41598-021-00139-3>
- Parmer, Dillon. “Defying the Conventional: Musical Performance, Embodied Cognition, and the Reconfiguration of Institutional Discourse.” *Music & Musical Performance: An International Journal* 1, no. 2 (November 2022): 1–36. <https://doi.org/10.34051/j/2026.17>.
- Parmer, Dillon. “Musicology, Performance, Slavery: Intellectual Despotism and the Politics of Musical Understanding.” *Intersections: Canadian Journal of Music* 34, nos. 1–2 (2014): 59–90. <https://doi.org/10.7202/1030870ar>.
- Pattison, Pat. “Developing Verse Ideas.” *Pat Pattison*. Accessed March 15, 2026. <https://www.patpattison.com/developing-verse-ideas>.
- Pattison, Pat. “Language and Songwriting.” *Pat Pattison*. Accessed March 16, 2026. <https://www.patpattison.com/language-and-songwriting>.
- Pattison, Pat. “Structure Creates Expectations.” *Pat Pattison*. Accessed March 15, 2026. <https://www.patpattison.com/structure-creates-expectations>.
- Peckham, Andrew D., R. Kathryn McHugh, and Michael W. Otto. “A Meta-Analysis of the Magnitude of Biased Attention in Depression.” *Depression and Anxiety* 27, no. 12 (2010): 1135–1142. <https://doi.org/10.1002/da.20755>.
- Pilote, Louise, and Valeria Raparelli. “Participation of Women in Clinical Trials: Not Yet Time to Rest on Our Laurels.” *Journal of the American College of Cardiology* 71, no. 18 (2018): 1970–1972. <https://doi.org/10.1016/j.jacc.2018.02.069>.
- Prieto Álvarez, Leticia. “Neurologic Music Therapy with a Habilitative Approach for Older Adults with Dementia: A Feasibility Study.” *Music Therapy Perspectives (US)* 40, no. 1 (2022): 76–83. <https://doi.org/10.1093/mtp/miab021>.
- Public Health Nursing Practice, Education and Research Program. *Administration, Scoring & Interpretation of the Edinburgh Postnatal Depression Scale (EPDS)*. Accessed April 25, 2026.

<https://phnprep.ca/wp-content/uploads/2025/07/Administration-Scoring-Interpretation-of-the-Edinburgh-Postnatal-Depression-Scale-EPDS.pdf>.

Puntarello, Maria, Giuseppe Davide Albano, Stefania Zerbo, Ginevra Malta, and Antonina Argo. “Sex Differences in Psychotropic Drug Exposure and Safety: A Systematic Review Toward Personalized Dosing Strategies.” *Journal of Personalized Medicine* 16, no. 4 (2026): article 189. <https://doi.org/10.3390/jpm16040189>.

Registered Nurses’ Association of Ontario. *Interventions for Postpartum Depression*. Toronto: Registered Nurses’ Association of Ontario, 2011.

Reich, Steve, and Paul Hillier. *Writings on Music, 1965-2000*. Oxford University Press, 2002.

Ruhé, Henricus G., Jan Booij, Dick J. Veltman, Martin C. Michel, and Aart H. Schene. “Successful Pharmacologic Treatment of Major Depressive Disorder Attenuates Amygdala Activation to Negative Facial Expressions: A Functional Magnetic Resonance Imaging Study.” *Journal of Clinical Psychiatry* 73, no. 4 (2012): 451–459. <https://doi.org/10.4088/JCP.10m06584>.

Schaeffer, Pierre. *À la recherche d’une musique concrète*. Paris: Éditions du Seuil, 1952.

Sapolsky, Robert M. *Behave: The Biology of Humans at Our Best and Worst* (Penguin Press, 2017).

Schurger, Aaron, Pengbo “Ben” Hu, Joanna Pak, and Adina L. Roskies, “What Is the Readiness Potential?,” *Trends in Cognitive Sciences* 25, no. 7 (2021): 558–570, <https://doi.org/10.1016/j.tics.2021.04.001>

Seth, Anil K. “Preface: The Brain as a Prediction Machine,” in *The Philosophy and Science of Predictive Processing*, ed. Dina Mendonça, Manuel Curado, and Steven S. Gouveia (London: Bloomsbury Academic, 2020).

Sheffield, Jeanne S., David Siegel, Mark Mirochnick, R. Phillips Heine, Christine Nguyen, Kimberly L. Bergman, Rada M. Savic, Jill Long, Kelly E. Dooley, and Mirjana Nesin. “Designing Drug Trials: Considerations for Pregnant Women.” *Clinical Infectious Diseases* 59, suppl. 7 (2014): S437–S444. <https://doi.org/10.1093/cid/ciu709>.

Shoemark, Helen, Marie Dahlstrøm, Oscar Bedford, and Lauren Stewart. “The Effect of a Voice-Centered Psycho-Educational Program on Maternal Self-Efficacy: A Feasibility Study.” *International Journal of Environmental Research and Public Health* 18, no. 5 (2021): article 2537. <https://doi.org/10.3390/ijerph18052537>.

Shorey, Shefaly, Cornelia Yin Ing Chee, Esperanza Debby Ng, Yiong Huak Chan, Wilson Wai San Tam, and Yap Seng Chong. “Prevalence and Incidence of Postpartum Depression among Healthy Mothers: A Systematic Review and Meta-Analysis.” *Journal of Psychiatric Research* (England) 104 (September 2018): 235–48. <https://doi.org/10.1016/j.jpsychires.2018.08.001>.

- Silverman, Marni E., Heather Loudon, Miriam Safier, Xenia Protopopescu, Gerald Leiter, Xun Liu, et al. "Neural Dysfunction in Postpartum Depression: An fMRI Pilot Study." *CNS Spectrums* 12, no. 11 (2007): 853–862. <https://doi.org/10.1017/S1092852900015595>.
- Šimić, Goran, Mladenka Tkalčić, Vedrana Vukić, Dora Mulc, Ena Španić, Marina Šagud, Fernando E. Olucha-Bordonau, Mihovil Vukšić, and Patrick R. Hof. "Understanding Emotions: Origins and Roles of the Amygdala." *Biomolecules* 11, no. 6 (2021): article 823. <https://doi.org/10.3390/biom11060823>.
- Stévance, Sophie, and Serge Lacasse. *Research-Creation in Music and the Arts: Towards a Collaborative Interdiscipline*. 1st ed. New York: Routledge, 2018.
- Stickel, Susanne, Lisa Wagels, Olga Wudarczyk, Sara Jaffee, Ute Habel, Frank Schneider, and Natalia Chechko. "Neural Correlates of Depression in Women across the Reproductive Lifespan: An fMRI Review." *Journal of Affective Disorders* 246 (2019): 556–570. <https://doi.org/10.1016/j.jad.2018.12.133>.
- Sultan, Pervez, Kazuo Ando, Rania Elkhateb, Ronald B. George, Grace Lim, Brendan Carvalho, et al. "Assessment of Patient-Reported Outcome Measures for Maternal Postpartum Depression Using the Consensus-Based Standards for the Selection of Health Measurement Instruments Guideline: A Systematic Review." *JAMA Network Open* 5, no. 6 (2022): e2214885. <https://doi.org/10.1001/jamanetworkopen.2022.14885>.
- Sun, Xiaoqing, Rui Wang, Shengnan Cong, Xuemei Fan, Lijuan Sha, Jingyi Feng, et al. "Effect of Music Intervention on Perinatal Depressive Symptoms: A Meta-Analysis." *Journal of Psychiatric Research* 178 (October 2024): 78–87. <https://doi.org/10.1016/j.jpsychires.2024.08.004>.
- The Vienna Declaration on Artistic Research* (Vienna, June 2020), <https://cdn.ymaws.com/elia-artschools.org/resource/resmgr/files/vienna-declaration-on-ar24-j.pdf>
- Thaut, Michael H. "Music Therapy as a Treatment Tool for Autistic Children." Master's thesis, Michigan State University, 1980.
- Thaut, Michael H., and Shannon K. de l'Etoile. "The Effects of Music on Mood State-Dependent Recall." *Journal of Music Therapy* 30, no. 2 (1993): 70–80. <https://doi.org/10.1093/jmt/30.2.70>.
- Thaut, Michael H., and Volker Hoemberg, eds. *Handbook of Neurologic Music Therapy*. 1st ed. Oxford: Oxford University Press, 2014.
- Tottenham, Nim. "Human Amygdala Development in the Absence of Species-Expected Caregiving." *Developmental Psychobiology* 54, no. 6 (2012): 598–611. <https://doi.org/10.1002/dev.20531>.

- University of Kansas. “Chapter 5: Intonation and Prosody.” *American English Pronunciation*. Accessed April 25, 2026. https://opentext.ku.edu/amenglishpronunciation/chapter/intonation_prosody/.
- U.S. Department of Health and Human Services, Office of Research Integrity. “Definitions.” *ORI Introduction to RCR: Chapter 3. The Protection of Human Subjects*. Accessed January 10, 2026. <https://ori.hhs.gov/content/chapter-3-The-Protection-of-Human-Subjects-Definitions>.
- U.S. Department of Health and Human Services, Office of Research Integrity. “Module 1: Introduction: What Is Research?” Accessed January 10, 2026. <https://ori.hhs.gov/module-1-introduction-what-research>.
- Van Meter, Jonathan. “Lady Gaga: Our Lady of Pop.” *Vogue*, February 2011. <https://www.vogue.com/article/lady-gaga-our-lady-of-pop>.
- Wang, Yang, Hui Li, Wei Peng, Yalin Chen, Mimi Qiu, Jun Wang, Qinghong Hao, Yang Tu, Yunlu Liu, and Tianmin Zhu. “Non-Pharmacological Interventions for Postpartum Depression: A Protocol for Systematic Review and Network Meta-Analysis.” *Medicine* 99, no. 31 (2020): e21496. <https://doi.org/10.1097/MD.00000000000021496>.
- Webster, Keith. “The Evolving Role of Libraries in the Scholarly Ecosystem.” In *Academic and Professional Publishing*, edited by Robert Campbell, Ed Pentz, and Ian Borthwick, 315–336. Oxford: Chandos Publishing, 2012. <https://doi.org/10.1016/B978-1-84334-669-2.50013-5>.
- Webster, Vicki, Paula Brough, and Kathleen Daly. “Fight, Flight or Freeze: Common Responses for Follower Coping with Toxic Leadership.” *Stress and Health* 32, no. 4 (2016): 346–54. <https://doi.org/10.1002/smi.2626>.
- Winans, Elizabeth. “Antidepressant Use During Lactation.” *Journal of Human Lactation* 17, no. 3 (2001): 256. <https://doi.org/10.1177/089033440101700309>.
- Wisner, Katherine L., Eydie L. Moses-Kolko, and Dorothy K. Y. Sit. “Postpartum Depression: A Disorder in Search of a Definition.” *Archives of Women’s Mental Health* 13, no. 1 (2010): 37–40. <https://doi.org/10.1007/s00737-009-0119-9>.
- Wonch, Kelly E., Christina B. de Medeiros, Jennifer A. Barrett, Alexandra Dudin, William A. Cunningham, Geoffrey B. Hall, Meir Steiner, and Alison S. Fleming. “Postpartum Depression and Brain Response to Infants: Differential Amygdala Response and Connectivity.” *Social Neuroscience* 11, no. 6 (2016): 600–617. <https://doi.org/10.1080/17470919.2015.1131193>.
- World Health Organization. “International Classification of Diseases 11th Revision.” Accessed April 29, 2026. <https://icd.who.int>.
- World Health Organization. “6E20 Mental or Behavioural Disorders Associated with Pregnancy, Childbirth or the Puerperium, without Psychotic Symptoms.” *ICD-11 for Mortality and Morbidity Statistics*. 2026-01 release. Accessed May 13, 2026. <https://icd.who.int/browse/2026-01/mms/en#1124422593>.

Wu, Qi, Zhijian Liu, Xiaoli Pang, and Ling Cheng. “Efficacy of Five-Element Music Interventions in Perinatal Mental Health and Labor Pain: A Meta-Analysis.” *Complementary Therapies in Clinical Practice* 40 (2020): article 101217. <https://doi.org/10.1016/j.ctcp.2020.101217>.

Wulff, Verena, Philip Hepp, Oliver T. Wolf, Tanja Fehm, and Nora K. Schaal. “The Influence of Maternal Singing on Well-Being, Postpartum Depression and Bonding: A Randomised, Controlled Trial.” *BMC Pregnancy and Childbirth* 21, no. 1 (2021): article 501. <https://doi.org/10.1186/s12884-021-03933-z>.

Zhu, Yue, et al. “Comparative Effectiveness of Non-Pharmacological Interventions for Postpartum Depression and Anxiety: A Network Meta-Analysis,” *Neuropsychiatric Disease and Treatment* 21 (2025): 2817–2834, <https://doi.org/10.2147/NDT.S549504>.