ABSTRACT

Title of Dissertation: MAKING IT THROUGH: PERSISTENCE AND ATTRITION ALONG MUSIC, EDUCATION, AND MUSIC EDUCATION PATHWAYS

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In this secondary analysis of data from the High School Longitudinal Study of 2009, I examine predictive factors related to uptake, persistence, and attrition on professional and educational pathways leading individuals to careers in music, education, and music education. I investigate seven years of longitudinal data comparing persistence and attrition factors between pathways, utilizing a multiple perspectives approach to conceptualize the equity of each point along the path.

Using recently updated restricted use data from the High School Longitudinal Study of 2009, an ongoing study conducted by the National Center for Education Statistics drawing on a nationally representative sample of over 25,000 individuals, I isolated people who, during their high school or college years, indicated intentions to pursue either educational or professional pathways leading to a career in music education. Additionally, I identified individuals who either expressed intentions to pursue pathways toward teaching a non-music subject or toward becoming a professional musician.

Tracking these individuals across four sampling points over a seven year period from the beginning of high school to the end of college illuminates the entry and exit points for aspirant music educators, non-music teachers, and professional musicians. I provide a tripartite conception of equity to evaluate the pathway outcomes associated with persistence and attrition along each of these respective paths by framing each outcome phase in terms of demographics, societal influences, and individual contributions. Comparing these populations horizontally to each other provides perspective on how the music education pathway relates to and differs from these parallel trajectories. Comparing persistent to attritive populations within each stream uncovers systematically predictive factors at key junctures.

Findings show the significant influence environmental factors, demographic profile, and individual navigational contributions have on uptake into, persistence along, and attrition from the music, education, and music education pathways. Further, these results illustrate key similarities and differences between those who persist on each parallel path. By illuminating some of the systemic choke points along the progression from high school student to professionally-intent degree seeker, this study may have recruitment, matriculation, retention, and attrition implications for music teachers, music teacher educators, policy makers, gatekeepers, and advocates.

# MAKING IT THROUGH: PERSISTENCE AND ATTRITION ALONG MUSIC, EDUCATION, AND MUSIC EDUCATION PATHWAYS

by

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Dissertation submitted to the Faculty of the Graduate School of the
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# Dedication

This work is dedicated to a small friend who, in her short time, demonstrated the very paragon of courage and tenacity in the face of insurmountable challenges.

# Acknowledgements

There are many people to thank without whom I would not have reached this point. First, I would like to thank my family for making me the person I am and providing me with the continuous support and encouragement needed to complete this endeavor. To my wonderful wife Aleena, thank you for all of the love and support you've given me while working toward this goal. You have often single-handedly kept our lives together over the past five years and I can't thank you enough for that. To my son, Oscar, thank you for learning to (mostly) sleep through the night in the course of this project. I hope to someday bore you with recounts of this excursion. To my sister, thanks for cheering me on and inspiring a sense of adventure in me. To my parents, thank you for teaching me that people and ideas can make the world a better and more equitable place.

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# Chapter 1: Introduction

In 2009, roughly 25,000 ninth graders across the country were asked what they wanted to be when they grow up. More precisely, they were asked what they thought their job or occupation at age 30 would be. The question itself cut to the core of the career, educational, and life trajectories spread out before these teenagers. Some answered in broad depictions, some had clear intentions, and some were understandably entirely unsure. Over the next seven years, these same individuals were asked this question again twice more along with an array of other questions about their educational and professional goals and intentions.

## What This Is

The present study is an investigation of individuals who, during their high school or college years, expressed interest in pursuing music, teacher, or music teacher career or educational trajectories. From examining demographics, environmental characteristics, and potential motivational and agentic factors, I examine these three populations in order to determine systemic patterns associated with individuals who enter, leave, or stay on these pathways. Using six distinct points along a seven-year time period, I trace the evolution of these three populations from the cohort's ninth grade year to three years after high school, examining outcomes at key determinant points along the way.

To gain a deep and broad perspective on the populations of interest, I employ secondary analysis of a nationally-representative sample of students. The 25,000 ninth graders described above, along with their aspirations, intentions, motivations, and decisions serve as the analytic sample for this study. The data for this study were drawn primarily from the High School Longitudinal Study of 2009 (HSLS), an ongoing

longitudinal study conducted by the National Center for Education Statistics (NCES) within the U.S. Department of Education (ED) using a nationally-representative sample of individuals who were first-time ninth graders in 2009. Using unique student and school NCES identification numbers to pair individuals and institutions across datasets, I supplemented HSLS data with three additional ED data sources—the Common Core of Data (CCD), the Integrated Postsecondary Education Data System (IPEDS), and EDFacts—to construct a multidimensional set of variables delving into individual, school, and college characteristics.

From this dataset, I modeled the predictive strength of demographic, school characteristic, and individual contribution variables as arbitrators of equitable or inequitable outcomes along the paths. To make sense of the data, I use a multi-conceptual approach to social justice as a theoretical framework to examine how each determinant point in the pathway achieves or fails to achieve distinct conceptions of equity.

## What This Is Not

While a fundamental goal of the secondary analyst is to cull new meaning from extant research, secondary analytic outcomes are forever bounded by the composition of the inputs. Although these data offer a wealth of information about the populations of interest, there are certain unknowable characteristics, experiences, and individuals who have had profound impacts on these students' trajectories that are unmeasurable in this study because they are wholly absent from the data at hand. An inspiring private lesson instructor, the formative summer band or choir camp, or a seemingly unfair college audition experience are all missing faces and places from these analyses. Although this study may reveal some of the superstructure driving systemic mechanisms at work along the pathway, these analyses remain some distance from the lived experiences and subtle

but important details involved in the unplanned chain reactions that so often dictate our futures.

With a clear conception of what this study is and what it is not, I turn my attention now to the structure of this document by chapter.

## Outline of the Document

The first chapter of this document serves as a preparation for the chapters to follow. After outlining the structure of this document, I delve into the purpose of this study and the constructs I will use to meet my aims. As the most important of these constructs to these analyses are the notions of equity and social justice, I next provide a discussion of how others in the field of music education have conceived of and operationalized these concepts. In order to approach my discussions and applications of equity that will follow, I present a multi-conception framework of equity that will undergird this project. With the theoretical and conceptual tools in hand, I close this chapter with the research questions that will guide the remainder of this study.

In chapter two, I look backward into the scholarly literature to understand the prior research that supports many of the decisions I made in undertaking this study. I draw in relevant lines of research from music education and education writ large to situate this study within music educational uptake, recruitment, persistence, and attrition scholarship. I present the literature as arrayed around the pathway progression from ninth grader to professional by interweaving a fictional narrative arc of one student's experiences. After establishing what we as a field know or suspect about each phase of the progression, I delve into how the present study supports and supplements prior work.

In chapter three I present the analytic method I undertook in answering the research questions. Importantly, I describe the steps I took and decisions I made in selecting,

preparing, and analyzing the dataset. By advancing a clear rationale for each of my many determinations and strategies, I hope to provide a lucid depiction of the planning and implementation of these analyses.

In chapter four I provide results from my analyses of the three pathways under investigation. I approach each analysis longitudinally, following three theoretical perspectives of pathway outcomes, each focusing on a distinct set of predictor variables. Within each analytic section, I present descriptive statistics and bivariate comparisons for the associated independent variables followed by predictive models showing the relative strength and influence of modeled variables on sequential pathway outcomes.

In the fifth and final chapter, I draw together findings and outcomes from the previous chapter in order to synthesize how the results speak to equity and inequity along music educator and related pathways. I use discussion topics to organize the salient results of these analyses and to provide policy, research, and pedagogical implications for each topic. I conclude the chapter and the document by discussing some of the limitations of this study and my final thoughts on how this project has met the purposes I now introduce.

## A Three Dimensional Purpose

This study serves three purposes. First, the study provides a longitudinal perspective on some of the systemic processes at play in determining the shape and composition of the American music educator workforce. Examining a seven-year period from the beginning of high school to the latter part of college offers me the necessary perspective to see how the aspirant population shifts and changes over time. In this first purpose, I consider the *longitudinal dimension* of pathway outcomes. Second, I seek to understand and describe how the people pursuing a music educational pathway compare in respect to

their peers in parallel pathways in music and education. What makes an aspirant music educator a music educator and not necessarily a musician or an educator alone? What kinds of uptake and attrition challenges does the music education profession share with these closely related fields? Drawing out similarities and differences through the *juxtapositional dimension* between the people pursuing these fields may provide a holistic conception of the pathway to becoming a music teacher. Third, and finally, I will interpret how determinant points along each of these three pathways achieve or fail to achieve multiple conceptions of equitable outcomes. The *equity dimension* allows me to interrogate multiple conceptions of justice and fairness along the pathway. These three purposes provide a three-dimensional conceptual space through which to explore and understand aspirant music educators' experiences (figure 1). Below I discuss in further depth how I approach each of these dimensions.

**The longitudinal dimension.**

*Stand in the place where you live,*
*Now face north,*
*Think about direction,*
*Wonder why you haven't before*
*(Stipe et al., 1988)*

The progression from high school student to credentialed music teacher is a well-worn path. However, as will be discussed in chapter two, scholarship suggests that this path may also function as a demographic and sociocultural winnowing process. Along racial/ethnic (Gardner, 2010; Elpus, 2015a; Draves, 2016; Thornton, 2018), socioeconomic (Bates, 2012), and cultural (Emmanuel, 2006; Abril, 2009; Kruse, 2016) lines, music teacher populations do not reflect the diversity of backgrounds and experiences in the schools. Though many have called attention to demographic disparities

(Gardner, 2010; Elpus, 2015a), pipeline inequities (Koza, 2008; Palmer, 2011), and homogeneity issues (Thornton, 2016; Draves, 2016; Elpus, 2015a) within music education, the field still lacks a clear longitudinal depiction of how a multitude of factors may render these outcomes by impacting uptake, persistence, and attrition into and through the field. Investigating access, entry, and exit points along the pathway may lead to better understanding of the mechanisms driving populations into, through, and away from the music teaching profession. In order to support the longitudinal dimension of this investigation, I use two conceptual structures, determinant points and bottlenecks, outlined below.

***Determinant points.***

Each point along the pathway from aspirant to professional represents a choice, an intersection, a point of determination. In the opening stanza of Frost's renowned verse, the poet bemoaned the fact that he could not travel both of the paths lain out before him (Frost, 1916). Similarly, the pathway from aspirant to professional is delimited by determinant points. Determinant points include not only the decisions made by the individual regarding which, whether, and how to pursue an educational or career path, but these points also represent those decisions, actions, and situations external to the aspirant. Outside actors, prior circumstances, environmental conditions, and personal traits all play roles influencing how and why individuals make the choices they do, and at times influence the array of choices set before an individual (Gecas, 2003). Like the Frostian fork in the road, each point requires a determination. While the type and array of choices set out before each of us throughout the determinant points in our lives will vary, we all share the experience of having to follow a single path that will make all the difference.

In this study I focus, cross-sectionally, on six distinct determinant points over the seven year analytic frame. Each determinant point was drawn from an HSLS data collection wave in which respondents were asked to indicate either future occupational or educational intentions. These determinant points coincide with stages of longitudinal development from high school student through the transition into postsecondary degree-seeker. Each successive point offers a glimpse into how the composition of the aspirant music educator population evolves through the secondary and postsecondary years.

***Bottlenecks.***

Fishkin (2014) defined a bottleneck as "a narrow place through which one must pass in order to pursue any of the many paths that fan out on the other side and lead to a wide range of valued roles and goods" (p. 144). Once identified, Fishkin offers couple of ways a bottleneck can be resolved. A bottleneck can be alleviated or deconstructed, allowing more to pass through. Alternately, a bottleneck can be left alone and circumvented by establishing alternative pathways around the closure.

In the context of the music educator pathway, there are a number of possible places for bottlenecks to occur. Secondary music enrollment and participation challenges could preclude certain individuals from formative music educational opportunities (Elpus & Abril, 2011 & 2019; Bates, 2012). Disparately resourced schools could limit access to high quality music programs for entire populations (Costa-Giomi & Chappell, 2007; Frierson-Campbell, 2007; Elpus & Grisé, 2019). The all-important audition process guarding the gateway into most postsecondary music degree programs may filter for a narrowly-defined conception of musical potential (Bowman, 2007; Koza, 2008; Palmer, 2011). High-stakes assessment and credentialing exams such as the Praxis I and II exams

may disproportionately skew in favor of certain populations (Gitomer, Latham, & Ziomek, 1999; Elpus, 2015a). The pathway to becoming a music educator, in this regard, starts to resemble more of a gauntlet than a bucolic Frostian road through the woods.

**The juxtapositional dimension.**

*Strangers on this road we are on,*
*We are not two, we are one*
*(Davies, 1970)*

I define the juxtapositional dimension of these analyses as a process of laying two similar but distinct things side by side for sake of comparison. Identity formation literature casts the music educator as an amalgam of two vocations, one part musician and the other part educator (Froehlich & L'Roy, 1985; Mark, 1998; Isbell, 2006; Pellegrino, 2009). If the music educator straddles the educational and vocational space between musician and educator, then the two corresponding fields represent adjacent experiences. Put in music theory terms, aspirant musicians and educators are the closely related keys[1] on either side of the aspirant music educator. These nearest neighbors share common experiences and challenges with aspirant music educators while maintaining their own defining traits. Through the juxtapositional dimension, I investigate how the music education pathway expresses this in between-ness by indulging the similarities and differences between the fields. How is each half of this dualistic music educator identity realized, acted on, or bracketed in the pursuit of the pathway? How does either side of the identity factor into the many determinations made while navigating this trajectory?

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[1] The architecture of chromatic tonal harmony rests largely on the interrelationships between key areas. In tonality relationships, keys can be closely related or distantly related. Closely related keys share at least six of their seven pitches in common, creating a multitude of overlapping harmonic shapes and making navigation between two closely related keys relatively fluid (Kostka & Payne, 2000).

Which traits and characteristics are common predictors between music education and the parallel paths on either side? In what ways do these paths share or negotiate inclusive equity challenges? By examining the parallel pathways toward becoming a music educator, musician, or educator, I hope to disentangle, through juxtaposition, both the shared and unique predictive factors influencing persistence or attrition in the music educational pathway. Understanding the challenges to persistence that are shared between the parallel pathways may help draw effective strategies across disciplines. Illuminating those challenges that are unique to the music educator pathway could uncover potentially self-inflicted burdens on recruitment to the field.

**The equity dimension.**

The third and final analytic dimension of this study is the equity dimension. Because equity can be an ambiguous and, at times, divisive concept, I start with a discussion of how music education scholars have attempted to untangle this knot followed by my interpretation of where these approaches may be found lacking. I finally look outward from music education in order to adapt a more nuanced approach to equitable conceptualization for the present study.

In the prologue of *Marginalized Voices in Music Education*, Talbot (2018) described the "patterns of injustice" he hoped his book may reveal. Each author in the book thoughtfully relayed challenges and obstacles they encountered along their own music educator pathways, each challenge tied their status as a marginalized *other* in the field. Though an entirely qualitative exploration of diverse voices reflecting on their individual lived experiences and challenges faced, the collected work points to larger systemic issues, patterns, within music education. Patterns are funny things. Obscured when

viewed too closely, with enough distance they reveal systems of repetition and predictability. The patterns Talbot was talking about reveal systems built from policies, traditions, habits, and other conscious and unconscious human actions. Therefore, what Talbot calls "patterns of injustice" could be construed as systematic and predictable human actions that inhibit equitable or socially just outcomes in the field of music education.

What qualifies as an equitable or socially just outcome is a matter of some complexity and certain positionality. Below, I offer how various music educational scholars have sought to conceptualize social justice and equity within the field.

In defining equity, Frierson-Campbell (2007) asserted that "a philosophy of equity and justice is enacted in response to the sense of injustice felt by practitioners and leaders" (p. 261). I read "felt" here as the operative word, suggesting that using "macro views" alone to identify systemic patterns is insufficient for spurring action without support from "micro view" lived experiences confirming feelings of injustice (p. 255). This balance between the macro identification and micro perception structurally supports Frierson-Campbell's notion of social justice work. However, finding equitable conditions in Frierson-Campbell's conception is complicated by her notion of social consciousness. Frierson-Campbell defines social consciousness as "the awareness that there is more than one valid way to view the world" (p. 259). Therefore, equity and inequity, justice and injustice are defined by what is felt at the individual level. Accepting this position, uneven macro-level patterns could likely produce a plurality of micro-level experiences, each equally valid.

Allsup and Shieh (2012) called attention to their places as educators in the micro-level enactment of social justice, defined as "a principled, even public response to a perceived hurt or act of injustice" (p. 48). Like Frierson-Campbell, Allsup and Shieh position the practitioner's perceptions and experiences as where social justice determinations are made. Allsup and Shieh underscored the critical roles educators serve in recognizing, naming, and engaging inequities in their classroom contexts. "At the heart of teaching others," they instruct, "is the moral imperative to care. It is the imperative to perceive and act, and not look away" (p. 48).

Recognizing a self-critical turn in music educational discourse surrounding social justice issues, Bradley (2007) called on the field to "break the silence" (p. 144) on issues of racial inequality. Bradley drew on two distinct definitions in describing the "complex and multifaceted" conceptual nature of social justice (p. 135). First, she used Connell's (1989) call to "tak[e] the standpoint of the least advantaged" by "understanding the real relationships and processes that generate advantage and disadvantage" (Connell, 1989, p. 125). Bradley problematized this conception by underscoring the inherently hegemonic and situationally-specific nature of assigning positions of "least advantage." How advantage is defined and who makes the determination of "least advantage" confect decision makers' biases into the heart of this construct. Next, Bradley invoked Griffiths' (1998) "good for the common interest" as a negotiation between the "good of each" and the "good of all" (Griffiths, 1998, p. 102). Similar to what Labaree (1997) termed "public goods" and "private goods," Griffiths' definition of social justice is found in the central tension and symbiosis between individual and collective aims. Like her critique of

Connell, Bradley pointed out the requisite positionality in determining "common interest."

Bradley synthesized these two approaches in asserting the work of social justice as "develop[ing] programs that actively take the standpoint of the least advantaged, and work toward a common good that seeks to undermine hierarchies of advantage and disadvantage" (p. 137). Hess (2015) would later describe this "uproot[ing]" of hierarchies as a "rhizomatic" approach "where knowledge exists in plateaus and actively relates to all surrounding knowledge" (Hess, 2015, p. 342). Bradley ultimately arrived at open discourse as her approach to confronting social justice in music education. By "break[ing] the silence" (p. 144) on issues of racial injustice and White cultural normativity, she suggested the field may start to move forward in redressing these issues.

Social justice rhetoric in the field has certainly increased in the intervening years since Bradley's call for more vocal denunciation of inequities. However, whether or not these words have helped to build coalitions, rectify positions of least advantage, and move the field as a whole in a substantively positive and more equitable direction is, again, a matter of positionality.

Hess (2017) asserted that broad terminology such as "diversity" and "social justice" function euphemistically in the field of music education by masking what she describes as a pernicious "ideology of white supremacy" (p. 20). Taking an anti-racist approach, Hess called on those working towards social justice aims to use explicit language in describing and decrying the particularities of injustices. Allowing latent inequity to lie unnamed and unchallenged, she contended, fosters implicit support for inequitable structures.

*Words like violence,*
*Break the silence,*
*Come crashing in,*
*Into my little world*
*(Gore, 1990)*

Allsup and Sheih (2012) advised that identifying and naming inequities is a necessary starting point for social justice work. As practitioners at the micro-level, music educators are well positioned to feel and react (Frierson-Campbell, 2007) to the ripples caused by Talbot's (2018) patterns of injustice. Bradley (2007) and Hess (2017) both suggest that, once defined, enacting social justice can come about through engaging in the uncomfortable conversations surrounding issues of inequity. However salient this progression may seem, the entirety of this combined conception hinges on how a single music teacher perceives of justice, injustice, equity, or inequity. As Bradley pointed out, positionality can be the fatal flaw of a social justice determination. Therefore, I reject the notion of a single determination of equity as insufficiently nuanced.

Because a single viewpoint will be forever biased by its own contexts, values, assumptions, and beliefs, a multiple perspectives conception of equity seems a more appropriately nuanced approach to determining equitable and inequitable conditions. Eschewing a lone dichotomous distinction, I draw upon work by Jencks to establish a system for making multifaceted determinations.

***Jencks' conceptions of justice.***

In a critique of the ambiguity surrounding equality of educational opportunity discussions, Jencks (1988) argued for five distinct conceptions of equitable distribution of educational opportunities. Jencks used a fictitious teacher and third grade reading class as a case study to illustrate how each equal opportunity conception dictates the teacher's

distribution of scarce educational resources—her time and attention—among the students. Jencks suggested that his metaphorical classroom not only reflects class level educational resource distribution but scales up to reflect decision making processes among school or district administrators or other higher level policy makers.

The case presupposes that the teacher, Ms. Higgins, comes to the classroom vaguely committed to providing equal educational opportunity to her students. Jencks provided five possible conceptions of equal opportunity from which Ms. Higgins must choose when allocating her time and attention among the students. Each of Ms. Higgins' options hinges on either factors within each student's control—such as effort or performance—or factors beyond the student's influence—societal shortchanging or genetic advantage and disadvantage. Whichever choice Ms. Higgins makes is internally justified by one of Jencks' distinct conceptions of justice. Each conception has its own strengths and flaws. There is, therefore, no "best" determination for Ms. Higgins, but multiple valid perspectives of equitable decision making.

***Multiple perspective equity.***

I draw from Jencks' framework in conceiving of a multiple perspectives approach to ascribing equitable or inequitable outcomes along the pathways. For the present study, I use three perspectives, which I term *environmental*, *profile*, and *navigational*, to assess three forms of equity at each determinant point. The first perspective, *environmental*, having the most theoretical distance from the individual, considers socially created and perpetuated structural environmental factors that may influence pathway outcomes. The second perspective, *profile*, accounts for the conditions one is born into, here including individual demographics and familial factors. The third perspective I employ takes into

consideration personal agency through individuals' choices and actions in *navigating* their pathways.

A metaphor of a river, a boat, and its captain may be helpful in understanding these three perspectives. Consider the environmental perspective the river itself with currents, hazards, and nuances wholly outside the captain's influence, yet nevertheless impacting the boat's course. Along the aspirant musician, educator, and music educator pathways, the river is the geographic and population environment of the high schools these individuals attended.

The boat itself represents the profile perspective. How the boat was constructed and the cargo it carries are considered here. As the boat traverses the river, there are certain advantages and disadvantages, within the environment, directly associated with the structure and load of the craft: the boat's inherent speed and maneuverability in the river, the depth or draw the boat can handle without running aground, and how the vessel reacts to various environmental changes. Again, although the idiosyncrasies of the boat impact the captain's navigational possibilities, the preconstruction and consignment of the boat, for sake of this metaphor, are beyond the captain's direct control. Each individual is a vessel bounded, to varying extent, by immutable characteristics and family influences. When sex, race, ethnicity, or parental education influence an individual's educational and occupational opportunities and outcomes, pathway success is biased in terms of profile equity.

Finally, the captain's choices, actions, and values demonstrated in maneuvering the vessel through the environment represent the navigational perspective. Although potentially influenced by characteristics of the first two perspectives, the captain is able

to directly impact the trajectory of the craft in this perspective. The decisions people make, their commitment to educational or career aspirations and objectives, and the values they bring to making decisions along the pathway are accounted for in the navigational perspective.

As was my critique of a singular perspective, each equity determination is itself flawed as incomplete. By considering pathway determinant points from each these three perspectives, I hope this study may provide a nuanced depiction of equity along the music education pathway. These three perspectives should not be considered exhaustive, but represent three possible ways to interpret pathway uptake, persistence, and attrition.

In this study, I use each perspective in isolation as a means to reveal a facet of the complex whole, examining the same set of outcomes, but focusing on a different set of possible contributors to those outcomes. In reality, these factors undergo a great deal of reflexivity and interaction with each other. Although this investigation underscores points of inequity from all three perspectives, no single perspective should be considered as the sole determinant or explanation at any given point.

I now turn my attention to how I will operationalize each of these three forms of equity within the practical confines of this study.

*Environmental equity.*

In assessing environmental equity, I start with the supposition of public education as the "great equalizer" (Mann, 1848), regardless of which school one attends. Each of the three pathways under examination in the present study—aspirant musician, educator, and music educator—begins in high school. To conclude that a pathway is environmentally just, students from disparate high school conditions should achieve persistence along

their respective pathways at statistically equivalent rates. If, for example, these analyses were to show that during the later high school years increased school-wide poverty levels had a significant impact on whether or not students pursued music degrees, then this point in the music pathway would be inequitable from an environmental equity perspective. Failure to achieve environmental equity suggests that societally-embedded injustice through disparately resourced and structured high schools plays a significant role in persistence or attrition along a pathway.

> Problem 1A*: If two unpowered rafts are sent from the same starting point to the same downstream port, but one is scheduled during the rising tide while the other is sent six hours later during the falling tide, which raft will take less time to complete the trip downriver?*

*Profile equity.*

In considering profile equity, I include student demographic and family characteristic variables as predictors of potential persistence or attrition. The profile perspective accounts for the familial and genetic life circumstances that are beyond the student's control. To conclude that a pathway achieves profile equity, pathway outcomes cannot be significantly associated with individual-level demographic characteristics. Similar to the example above, if an individual's family socioeconomic status were to factor significantly into their pursuit of a music degree, this point in the pathway would not satisfy profile equity.

> Problem 1B*: If two barges leave the same port at the same time traveling on the same route to the same destination but one is carrying a full load of cargo while the other is completely unencumbered, which one will have consumed more fuel if both barges arrive at the same time?*

*Navigational equity.*

With environmental and demographic factors accounted for in the first two perspectives, what remains in determining persistence or attrition are intrinsic elements such as motivation, ability, effort, desire, determination, needs, values, and attitudes. I use navigational equity to consider these individual contribution factors.

In contrast to the other two conceptions of equity, navigational equity accounts for only the individual's direct sphere of influence. Navigational equity is found in outcomes based on the individual's efforts toward achieving those outcomes—well demonstrated in *Back to the Future* by the Doc Brown philosophy that if you put your mind to it, you can accomplish anything (Gale, Canton, & Zemeckis, 1985). Absent demographic variables and high school characteristics, student persistence along a navigationally just pathway could be explained by what and how one invests in persisting.

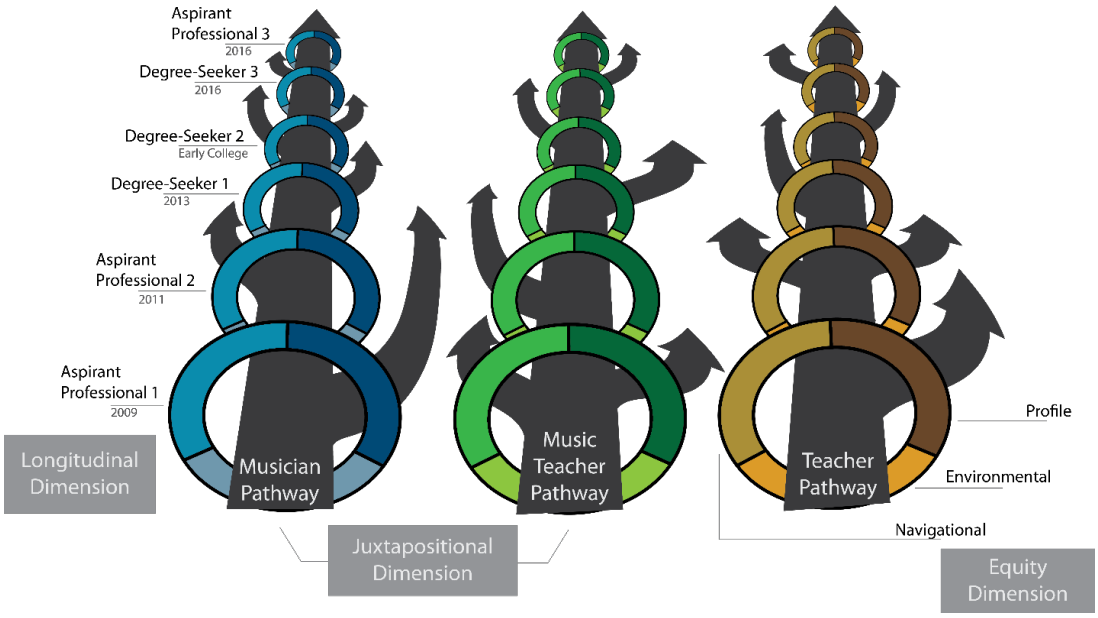
The navigational perspective is simultaneously forward and backward looking, drawing on both prior actions and future goals. Among prior effort and achievement predictors, I consider high school enrollment choices and scholastic outcomes. I examine forward-looking success indicators from individual intention and value statements regarding educational and career objectives. With the navigational predictors, I hope to capture the student's agency, free will, and intentional contribution to their own pathway outcomes. Using the navigational perspective, I seek to measure the individual's ability to reach their professional or educational goals through intention, effort, and achievement.

> Problem 1C*: If two ferries alternate on the same hourly route between two terminus ports, except for the fact that one captain chooses to stop at every intermediary port while the other only stops at every other port, assuming equal distribution of passengers, which captain will have transported more passengers by the end of the day?*

Music teacher education degree program gatekeepers would likely defend their processes as functioning within the rules of navigational equity. By investing scarce enrollment space, time, and attention in individuals who demonstrate certain characteristics through prior accomplishments, outcomes, and current dispositional or value alignment, music teacher educators intake and promote those who are most likely to succeed in the field. However, if the individuals identified as likely to succeed are also identifiable by profile or environmental predictors, the navigational equity of the pathway must be called into question. When environmental factors or demographic characteristics play significant roles in predicting pathway determinations, these elements could be considered to give certain individuals distinct advantages over others before individual contribution is taken into account.

Because the metaphorical captain's navigational options could be limited, expanded, or otherwise determined by environmental or profile conditions, the other two perspectives must be considered as contextually relevant when making navigational equity determinations. If achievement or predictive success measures are colored by or completely superseded by family inputs or school structure, the determination becomes an unequal measurement with more required from those who are situated with less profile or environmental advantage.

Figure 1. The Three Analytic Dimensions




## Research Questions

Using environmental equity, profile equity, and navigational equity, I structure my research questions as examinations of how determinant points along each of the three parallel pathways—to musician, to music educator, or to educator of another subject—achieve or fail to achieve each conception of justice.

Each research question addresses one perspective of equity. In order to assess environmental equity along the pathways, I ask the research question:

How do high school characteristics vary between students on and leaving the music education, music, and education pathways at each determinant point?

To assess profile equity, I ask the second research question:

How do student demographics vary between students on and leaving the music education, music, and education pathways at each determinant point?

In research question three, I examine each determinant point from the perspective of navigational equity—here focusing on students' past actions and future intentions:

How do student actions, choices, and expressed values regarding high school, college, and careers vary between students on and leaving the music education, music, and education pathways at each determinant point?

Answering these three research questions across six longitudinal determinant points will determine if, when, and how equity of inclusion breaks down along each of these pathways.

# Chapter 2: Literature

This chapter provides an account of the empirical research supporting this study. I have limited this review of the literature to empirical studies involving student and teacher populations in the United States. There is considerable scholarship from outside the U.S. that has investigated teacher recruitment, persistence, and attrition (Kyriacou & Coulthard, 2000; Richardson & Watt, 2006; Manuel & Hughes, 2006), however, because there are myriad sociological and historical factors that play into the unique structure of the American progression from student to music teacher, I limit this review to focus specifically on the body of knowledge concerned with the American music education pathway.

I structure this chapter in the same longitudinal manner as the study. I start by examining secondary music educational experiences including enrollment demographics, curricular factors, and other experiences that may impact pathway persistence and attrition. I next turn my attention to literature concerning secondary student career aspirations and music educator recruitment during the high school years. I then focus on scholarship regarding gateway mechanisms that influence access to post-secondary music teacher education programs. The next section is a review of literature pertaining to pre-service music education students and the experiences these individuals have during their college years. The final phase of literature covered here regards the theoretical outcome of this pathway, music teacher populations. I conclude the chapter with what I perceive as the relevant gaps in this body of knowledge and how this study will contribute to filling in the gaps.

In an effort to humanize the progression which I and these authors investigate, I have woven throughout this literature review a fictional narrative account of one aspirant music educator whom I introduce now.

## Nick's Story, Part 1

Presuppose an eager and ambitious rising ninth grader named Nicholas. Nick grew up in a White, English speaking, not recent immigrant, upper middle class, two-parent household in a well-regarded suburb about an hour from the city. Nick's father is a professor at the nearby university and his mother teaches elementary general music. His parents are both active members of the PTA and school music boosters organization. Nicholas has, for the most part, enjoyed and excelled in his public school experiences, regularly earning a place on the honor roll and playing the alto saxophone in school bands since the fifth grade.

Because he has enjoyed his primary and middle school experiences in band, when confronted with high school enrollment decisions, Nicholas opts into taking additional music class credits, adding jazz band to his schedule in addition to wind ensemble—a decision his parents and his private sax instructor both encourage and support. In a couple of years he might add choir, guitar, or AP music theory to his schedule. As roughly one out of four students in the school enrolled in music ensembles, Nick would likely find himself in demographically familiar company.

## High School Music Populations

The music educator pathway under examination in the present study starts from the students' experiences, perceptions, and intentions during their high school years. Because high school experiences play a key part in many aspirant music educators' decisions to pursue the field, as will be discussed in the next section, I begin by

establishing the setting where these early inklings of career intentions likely germinate, high school music classes. Below I review scholarly literature concerning high school music population characteristics, the factors that influence high school music programs, and the patterns associated with school music participation.

**School characteristics.**

In a study on access to secondary music education, Stewart (1991) investigated the curricular and population characteristics among the nation's high school music programs. Stewart drew data from High School & Beyond (HS&B), an NCES predecessor to HSLS, which includes a sample of over 60,000 high school sophomores and seniors from 1,000 schools across the country. This dataset is nationally representative of all American high school graduates in the class of 1982.

Stewart's study served dual purposes. First, she examined school characteristics associated with the presence and diversity of music programs. Second, she sought out the student characteristics that were associated with students who enrolled in music courses. Stewart used school-level, student-level, and transcript data to investigate the presence of school music programs and student enrollment patterns in these programs.

Stewart found that the vast majority of high schools (90%) offered some type of music class. Likelihood of offering music decreased slightly if the school was small (less than 500 students), Catholic, located in the South, included a high proportion of lower SES students, or had a low college-bound graduate rate (< 33%). Stewart did not find any significant associations between schools offering music and school urbanicity or percentage of racial/ethnic minorities (here coded as Black or Hispanic) at the school.

When examining enrollment patterns, Stewart reported that 36.5% of students overall enrolled in some type of music class during their high school careers with the majority taking either band or choir. Stewart found significant relations between school music enrollment and sex, SES, and private lesson involvement showing females, students from more affluent families, and those who participate in private lessons as more likely to be enrolled in music classes. Stewart noted that female over representation was driven primarily by choir enrollment patterns and that economic factors were most readily seen in low SES under-representation in instrumental music classes. Additionally, she found White students to have significantly higher enrollment rates in specifically band ensemble classes than racial/ethnic minority students. Although racial/ethnic minority status played no significant role when looking at whether or not students took any music classes, Stewart found that racial/ethnic minorities had significantly fewer music credits on their transcripts than their non-minority peers. Stewart also found that high achieving academic students were more likely to enroll in music than their peers.

When looking at school characteristics, Stewart found rural schools, urban schools, and smaller schools to have higher music enrollment than other types of schools. She pointed out that while larger schools tended to have more diverse music course offerings, smaller schools had higher schoolwide participation rates in music programs. Stewart pointed to an interesting contrast between the types of students who tended to enroll in music at higher rates and the types of schools that tended to have higher music enrollment. Whereas more affluent and higher academically performing students were more likely to enroll in music, schools with higher percentages of lower SES students and lower percentages of college-bound graduates showed higher music enrollment patterns.

Stewart speculated that this misalignment meant that within lower-resourced, lower-achieving schools, more affluent and higher achieving students are drawn into the music programs at higher rates while their peers in higher-resourced and higher-performing schools showed less relative interest in music classes.

While investigating the results from *Arts Education in Public Elementary and Secondary Schools*, a 2002 study from NCES, Frierson-Campbell (2007) found inequitable distributions of music and arts educational resources among the nation's schools. The study showed arts resource disparities based on school size and the percent of racial minority enrollment. Larger schools, Frierson-Campbell noted, were more likely to have greater resources and high percentage minority schools more likely to have fewer resources. Equating equity with equality, Frierson-Campbell posited that these macro-level differences point to inequitably distributed arts resources, evincing what Talbot (2018) might call a pattern of injustice.

Costa-Giomi and Chappell (2007), when investigating 25 public secondary schools in a large Texas district, found significant funding disparities to be correlated with the proportion of racial/ethnic minority students and the percentage of lower SES students at the school. Costa-Giomi and Chappell surveyed band directors at each middle or high school in the sample regarding teacher information, program information, and teacher perceptions. The authors paired survey responses with school demographic data available from the Texas Education Agency to assess relations between school demographics and program characteristics. Results showed significantly fewer students at schools with higher proportions (> 66%) of students receiving free or reduced price meals or high percentages of racial/ethnic minorities (> 50%) were involved in private lessons

whereas schools with lower proportions (< 33%) of students receiving free or reduced price meals or lower percentages of racial/ethnic minorities (< 20%) had significantly more students in private lessons. Teachers at higher income schools and low percentage racial/ethnic minority schools more frequently reported support from parents, financial aid for students, and adequate technological resources than did teachers at low or middle income schools or those at schools with higher proportions of racial/ethnic minority students. The authors relayed that at low income schools, parents were less likely to be involved in band fundraising, volunteering, and travel performances while their counterparts at high income schools were very involved in these activities. When asked about the distribution of resources between schools in the district, all of the teachers at high income schools indicated that they thought resources were equitably distributed while only two teachers at low income schools agreed with this sentiment. Costa-Giomi and Chappell's findings point to the direct and indirect impacts school wealth and racial/ethnic composition can have on music educational experiences and opportunities.

Adderly, Kennedy, and Berz (2003) explored the experiences of high school large ensemble participants. The setting for the study was a large high school in a suburban "predominantly upper-middle-class socioeconomic area" (p. 192). The school was approximately two-thirds White, one-quarter Asian, with the small remainder of students identifying as Black, Hispanic, or another racial or ethnic category. Adderly et al. depicted the music department at the school as well-resourced and supported by the administration. Approximately 17% of the student body was enrolled in either band, orchestra, or choir. The authors reported that many of the participants they spoke with were enrolled in multiple performance ensembles and/or the music theory class. Using

structured interviews with a purposive sample of 20 students from each of the three large ensembles ($N = 60$), Adderly et al. investigated the "subculture of the music classroom" (p. 192). The authors sought to uncover enrollment and persistence motivations, student perceptions of the music ensembles, and the social climate of the music classroom. Among motivational factors influencing students to enroll or persist in school music, Adderly et al. highlighted parental pressure to join, student enjoyment of music performance, the respite from academic courses music provided, and the sense of community students felt in the ensembles. One participant described the music room as a place to "break down…social barriers, and…get to know people a lot better than you would outside of the music room" (p. 195). In contrast, another participant described the largely Asian orchestra class as a place to connect and socialize specifically with other Asian students. Participants reflected on the pro-social experiences of being a part of the ensemble community or what the authors dubbed their "home away from home" (p. 190).

**Enrollment demographics.**

In a secondary analysis of the Elementary Longitudinal Study of 2002 (ELS), Elpus and Abril (2011) showed significant associations between high school music enrollment patterns and a number of demographic variables. Drawing on a nationally-representative dataset ($n = 13{,}240$), the authors determined that, in 2004, 21% of high school seniors participated in band, orchestra, or choir at their schools. Results showed significant positive associations between music enrollment and being White (65.7%), female (61%), coming from a higher socioeconomic status, being a native English speaker (90.4%), having parents with advanced degrees, and having a strong high school GPA. The study did not show a significant relation between music enrollment and

urbanicity. Elpus and Abril showed significant negative associations between music enrollment and being male (39.9%), Hispanic (10.2%), coming from low socioeconomic status, being a native Spanish speaker (4.4%), having parents with only a high school diploma or less, and having a low high school GPA. Additionally, the authors showed that students who participated in music ensembles at their schools averaged 3.95 Carnegie units of visual and performing arts credits, translating into approximately four one-year classes taken during the high school career. The authors underscored how their findings illustrate general underrepresentation in school band, choir, and orchestras among many traditionally disadvantaged populations.

Drawing on HSLS data, Elpus and Abril (2019) completed a follow-up study to their 2011 demographic profile of secondary music students. In contrast to ELS data used in their previous study, HSLS transcript data allowed the authors to disaggregate students enrolled in music ensembles by ensemble type. The authors used a combination of bivariate comparisons and multivariate logistic regression to assess the relations between and predictive strength of a number of demographic variables on ensemble enrollment. The demographic predictor variables Elpus and Abril included were sex, race/ethnicity, SES, family characteristics, and academic achievement. Among the 24% of high school students enrolled in music ensembles, results showed significant female over-representation overall in music ensembles (60%) driven primarily by choir and orchestra enrollment which were 70% and 61% female, respectively. Sex was not a significant determinant of band enrollment with a near even distribution showing slightly more males (52%) than females in band classes. Socioeconomic status results showed over-representation by the highest quintile and underrepresentation by the lowest quintile,

particularly in instrumental ensembles. While SES was a significant enrollment predictor in the aggregated dataset, when disaggregated by ensemble, SES was only a significant enrollment predictor for band enrollment. White students appear to be slightly over-represented in all types of ensembles, accounting for 58% of ensemble members but only 52% of the student population. Hispanic/Latino under-representation appears to account for most of this difference with Hispanic/Latino students making up 22% of the student population but only 17% of the students in music ensembles. Elpus and Abril reported that race/ethnicity had a limited but significant impact on music enrollment. Among choir students, however, race/ethnicity distributions were not significantly different from the population at large. Interestingly, Elpus and Abril found an inverse relationship in the interaction between academic achievement and Black/African-American students' likelihood of ensemble enrollment. Whereas, for all other racial/ethnic categories prior academic achievement was associated with an increased chance of enrolling in a music ensemble, for Black and African American students academic achievement decreased the chances of ensemble enrollment. When looking at native language, Elpus and Abril found that being a native English speaker was significantly associated with increased likelihood of music enrollment.

Engaging music educational discourse around curricular diversity, the authors discounted the limited impact small enrollment-capped alternative music class formats (e.g. music technology, songwriting, popular music) could have on increasing music enrollment diversity. It should be noted that low enrollment curricular reiterations of prevalent band, choir, or orchestra formats (show choir, chamber wind ensemble) could currently be taking up space that would otherwise be available to potentially more

inclusive offerings by claiming scarce music instructional resources. Although beyond the scope of both Elpus and Abril's study and the one at hand, a more nuanced investigation into the roles smaller music class formats play in enrollment diversity is certainly warranted.

Citing data from her local school district in Madison, Wisconsin, Bradley (2007) noted the precipitous drop-off in arts enrollment by students of color from elementary to the end of secondary school. Although White students only made up roughly half (51%) of the population during the K-5 years when music enrollment is compulsory, by high school, White students comprised nearly two-thirds (64%) of those enrolled in fine arts classes. Bradley described colonialism as "alive and well" (p. 134) in American music education pointing to the exclusionary impact prevalent Eurocentric curricula could have on influencing this trend toward racial homogeneity. While potentially troubling, these data points lack the nuance of disaggregation from the other arts subjects. Although empirical analysis hardly seems the focus of Bradley's paper, the speculative nature of her treatment of the data points she provided leaves quite a bit of room for question.

**Summary of high school music populations.**

A vast majority of American high schools offer music programs (Stewart, 1991), primarily featuring band, choir, and orchestra large ensembles (Stewart, 1991; Elpus & Abril, 2019). However, school characteristics and the student demographic composition can have significant impacts on whether or not schools offer music (Stewart, 1991) or on the quality of music programs offered (Costa-Giomi & Chappell, 2007; Frierson-Campbell, 2007). While there are mixed results on the quality of music programs at majority racial/ethnic minority schools, high proportions of students in poverty has

proven a consistent predictor of limited high school music educational opportunities. High poverty rates have been linked to low participation in private lessons and extracurricular enrichment activities (Costa-Giomi & Chappell, 2007), limited educational resource availability (Frierson-Campbell, 2007), and negative environmental perceptions from music teachers (Costa-Giomi & Chappell, 2007).

Secondary music student population demographic data suggest a fairly consistent student profile. The approximate third of all high school students who enroll in music classes are slightly more frequently female than male (Stewart, 1991; Elpus & Abril, 2011, 2019) and Whiter than the average population (Stewart, 1991; Bradley, 2007; Elpus & Abril, 2011; 2019). Additionally, high school music students are generally more affluent than their peers (Stewart, 1991; Elpus & Abril, 2011; 2019), particularly those students who enroll in instrumental music ensembles.

Nicholas, our fictitious protagonist, would be quite comfortable in his "home away from home" (Adderly, Kennedy, & Berz, 2003, p. 190), the high school band room. His shared experience of growing up White and upper-middle class is reflected by many of his bandmates. Nick is fortunate to be zoned for a school with a well-resourced and robust music program giving him access to a wide array of quality music educational experiences that will play an important part in shaping the course of his future.

## Nick's Story, Part 2

Now mid-high school, Nick is giving his first serious considerations to his college and career trajectories. Finding his place in the school band, he is somewhat enamored with the sense of community he feels in the ensembles led by the charismatic and respected band director. His parents have taken active roles in the band boosters organization, each chairing a subcommittee and regularly volunteering to chaperone for

the band's travel performances. Nick's experiences of making first the all-county and then the all-state wind ensemble coupled with his section leader status in the band give him a sense of pride and leadership within the program. When asked what occupation he thinks he sees himself in at age 30, Nick answers, "high school band director."

## Degree and Career Selection

Below I examine the research pertaining to secondary students' decisions to pursue music education degrees. The vast majority of this recruitment literature took a retrospective approach by asking current postsecondary music education majors to reflect back on the factors that led them into a music education degree or career track. Nevertheless, these studies provide a depiction of the population who goes on to pursue the degree. Although not discussed here, it should be noted that there exists a robust body of education scholarship examining similar pathway uptake and persistence characteristics leading to the pursuit of STEM fields (Heilbronner, 2011; Maltese & Tai, 2011; Wang, 2013; Cannady et al., 2014).

Through analyzing undergraduate music education majors' ($N = 90$) free written responses to a given prompt, Madsen and Kelly (2002) sought to uncover pre-service music teachers' earliest memories of considering becoming music teachers. A slight majority (56%) pinpointed their high school years as the decision point while just under a quarter (22%) indicated the decision happened in college. Around half of respondents indicated that they were in a band, orchestra, or choir ensemble room at school or with large ensemble classmates and teachers when they first considered the occupation. For respondents who more gradually arrived at the decision, findings pointed to key performance experiences accrued along the way. The authors caution that later decisions—during the college years—to pursue the profession may evidence ambivalence

toward the decision itself, although Brown and Alley (1983), found contrary evidence twenty years prior. Though Madsen and Kelly's claim appears unsupported from their findings, their suggestion could warrant further inquiry into motivations and outcomes associated with later commitment to the field.

In order to assess secondary music students' perceptions of possible music education careers, Councill (2004) surveyed 265 sixth to eleventh grade music students from urban central Ohio secondary public schools. The student population at each of the three schools included in the study was majority African-American. Free lunch participation at the three schools ranged from 28-43% of the student population. Although Councill did not provide descriptive demographic statistics for her respondent sample, she indicated that at each school, a majority of the students enrolled in music classes were female, ranging from 54.1% to 72.3%. My own secondary analysis of data in the appendix of the study suggests that Councill's sample was very likely 72.8% female. Councill asked students about their academic interests, career aspirations, perceptions of a variety of professional fields, and their opinions of their current music teachers. When asked to rank their perceptions of various educational careers, physical education teacher earned the lowest composite score while music teacher received the highest. Though Councill found variation in the underlying career ranking constructs, there were no significant differences in these composite findings by grade level or gender. Comparing music education to a variety of non-educational careers, males ranked music education seventh out of twelve career options while females ranked the field fifth. The highest ranking careers overall were lawyer among females and movie star among males. When indicating potential career aspirations, students were asked to provide both

their ideal and probable careers. Councill noted a common discrepancy between the two answers with responses to the former category often being more romanticized fields while responses to the latter category tended to be more practical aspirations. Among the responses, a handful of students indicated ideal (2.3%) or probable (2.0%) music teacher career aspirations. Although the most frequent response to the probable career question was "lawyer" among both males and females, males offered a wider variety of responses which Councill suggested as possible evidence of a gender disparity with female students perceiving fewer professional options than males. When respondents were asked what they thought the most important characteristic or quality for a music teacher to possess was, nearly two thirds (64.4%) of students indicated some form of interpersonal trait with "patience" being the most frequently listed characteristic. In all, Councill's study provided support for the notion that adolescents may develop fairly strong opinions and perceptions of prospective careers during their middle and high school years. Councill called for further investigation into the myriad factors and influences acting on secondary students' consideration of music teaching careers.

In a recent study, Rickels et al. (2019) examined the influences and motivations associated with secondary music students' decisions to pursue or not pursue music and music teaching professions. The investigators collected responses to a questionnaire from high school aged students attending two music summer camps ($N = 157$). Respondents were 53.5% female and 79.6% White. The mean age of respondents was 15.4 years old with approximately two-thirds of respondents (64.3%) reporting their grade as 8$^{th}$, 10$^{th}$, or 11$^{th}$ grade. The researcher-designed questionnaire covered student occupational aspirations, demographics, and attitudinal statements regarding career perceptions and

influential people and experiences. Approximately two in five respondents indicated professional music aspirations with 14.6% of the sample indicating music teaching aspirations and 27.4% expressing other professional music intentions. Rickels and colleagues used principal components analysis and discriminant analysis to isolate features predictive of selection into music, music teacher, or other professional aspirations. Rickels et al. found that the decision to pursue musical occupations was "multidimensional" (p. 13) with no single predictive factor driving the choice alone. These results showed that the confluence of influential individuals, experiences, and student values collectively impacted occupational intentions. The authors acknowledged the inferential and generalizability limitations of their relatively small and homogenous response sample and called for larger scale studies utilizing more generalizable populations.

Citing degree granting data from Arkansas public and independent postsecondary institutions, Bates (1997) called attention to the fact that only five (4%) of the 119 undergraduate music degrees awarded in the state in 1995 were given to African Americans and only three (2.5%) of those five were music education degrees. In an effort to explore factors leading to African American underrepresentation in music education degree programs, Bates surveyed 78 11th and 12th grade African-American band, choir, and orchestra students from Arkansas and Tennessee who expressed interest in majoring in music or music education about the factors leading them to choose these degrees. Around one quarter (25.6%) of participants expressed an intent to pursue music education, while the remainder of those responding (69.2%) indicated intentions to pursue a music degree other than music education. A slight majority (52.1%) of

participants reported that high school was the time they made the decision to pursue a career in music or music education; fewer indicated making this decision in middle school (35.2%) or grade school (12.7%). The most frequently reported people influencing the decision to pursue either a music or music education degree were the respondents' high school ensemble director (36.6%) or a close family member (33.3%). Nearly half (48.6%) reported that a close family member was the *most* influential person in making the degree choice with the percentage rising slightly to 50% when isolating only aspirant music educator responses. Results on the impact of race in musical teaching were mixed with a majority of participants (75.6%) agreeing that race was not an important factor in the classroom. Although Bates' study provides a great deal of descriptive data about the participants' high school experiences and perceptions about their respective degree choices, his sparing use of statistical measures limits the inferential power of his findings.

From a survey of 578 undergraduate music education majors at randomly sampled NASM-accredited schools of music, Isbell (2008) identified a number of high school socialization factors influencing individuals' choices to pursue music education degrees and music teaching careers. Around two-thirds of respondents said they made the decision to pursue the music teaching profession during their high school years while far fewer (9%) made the decision during middle school. Just under one quarter (23%) reported deciding to become a music teacher during college. Among the people who had a positive influence on respondents' decisions to pursue the music teaching profession, the most frequently reported people were the respondents' music teachers (37%), parents (33%), and private music teachers (17%). Isbell speculated on the potential role parents play in sparking interest in the profession while teachers and private instructors sustain

interest and participation, calling for deeper investigation into the interplay between parent and teacher influences during this critical decision period.

Although people played a critical role in respondents' career decisions, Isbell's results suggest that experiences—particularly high school performance experiences and postsecondary music teacher training experiences—had the strongest effect on respondents' music educator occupational identities. Isbell admitted the potential positive influence bias in his sample from including only those individuals who were pursuing music education degrees and excluding those who may have been dissuaded from the pathway.

Responding to a perceived music teacher shortage and with support from MENC, Bergee et al (2001) surveyed roughly 30% of Collegiate MENC member music education students ($N = 431$) regarding the factors influencing their decisions to pursue a music education degree. Respondents were overwhelmingly White (87.7%) and a majority were female (68.9%). Respondents from the Western and Northwestern divisions appear to have been underrepresented among respondents (5.1% & 3.5%, respectively). Findings showed a normal distribution around eleventh grade as the point at which respondents made the decision to pursue music education, although nearly a quarter of respondents made the decision to pursue the degree while in college. Among those most influential on inspiring respondents to pursue a music education degree, respondents cited high school music ensemble directors, parents/guardians, private music teachers, and higher education music professors. Among influential experiences, participants cited school music ensembles, honors/All-State/District ensembles, church ensembles, community ensembles, music camps, higher education events, competitions, and performances at

conventions. Participation in All-State ensembles was the most frequently reported (23.7%) “most influential” experience followed closely by contest/festival/solo and ensemble (20.6%). A vast majority of respondents (95.5%) indicated that being given peer teaching opportunities in their school music classes had an influence on their decision to pursue music education. Only a few respondents (5.2%) cited “anticipated salary” as a draw to the profession with majorities listing “love of music” (98.4%), “desire to work with people” (72.8%), and “felt called to teach” (67.9%). A slight majority (68.4%) of respondents indicated membership in their collegiate MENC chapter as an influence on their persistence through the program. Among the majority of respondents (68.4%) who had attended a music educator’s convention during their programs, 93.4% indicated that attending conventions was a factor in their persistence through the program. Bergee et al., in response to the number of students who are attracted to the field late in their college experiences, recommend alternative certification pathways that do not compromise teacher quality standards. Because of the heavy parental influence on music education degree pursuit, the authors suggested targeting specifically parents with music teacher recruitment materials.

Bright (2006) surveyed 580 “outstanding” collegiate band students in two states regarding the factors influencing students’ choices to either pursue or not pursue a music education career. The author defined “outstanding band students” as students who, while in high school, demonstrated high levels of musical achievement through honor bands or solo and ensemble festivals, or who held leadership positions in their bands. Just over half of the students in the sample were male (54.7%) and just under half reported that they were current music education majors (42.6%). The sample of non-music education

majors included an aggregate of other types of music majors and non-music majors. Results from a MANOVA showed significant differences within several traits with music education majors reporting higher average influences than non-music education majors in parental influence, teacher influence, ego satisfaction, confidence in talent, interest in the subject, and economic considerations. Additionally, Bright found that females were significantly underrepresented among band students pursuing careers in music education accounting for only 37% of respondents in the degree. The author found no statistically significant differences between aspirant music educators and the rest of the population among the other demographic variables he investigated including SES, high school classification, total years of band participation, total years of non-band music classes, year of entry into band program, and total years of private lesson instruction. Bright found that music education majors had significantly lower high school GPAs than non-music education majors. When examining participant agreement with a number of career-related statements, Bright found music education majors had significantly lower agreement with the statement "I feel salary is an important factor in choosing a career" than did non-music education majors, suggesting pre-service music teachers as less financially-minded than their in-service counterparts. Although Bright's study explores the motivational space between music education and non-music education students, the study neglects factors influencing movement *between* the two categories. Further, by limiting his study to students who were heavily involved and successful in their high school band programs, Bright likely limits his sample to a demographically select subset of the population as later research would suggest (Elpus & Abril, 2011 & 2019).

McClellan (2011) surveyed 148 undergraduate music education majors from North Carolina and Idaho in order to ascertain potential relations between music education degree pursuit and a variety of demographic, familial, and self-conceptual factors. The respondent sample was slightly more female (54.7%) than male, predominantly White (78%), with a majority from (83%) middle or upper class SES families. More than 60% of respondents' parents held at least a bachelor's degree. For the purposes of the study, the author developed a novel self-concept and parental influence survey instrument wherein participants were asked to reflect on their adolescent experiences and beliefs through a series of Likert-type questions. Results showed weak but significant correlations between respondents' adolescent self-concepts as music educators and a number of factors indicating parental involvement in respondents' music education. Interestingly, McClellan did not find a significant relation between parent participation in musical groups and respondents' adolescent self-concept as music educators. Responses indicated significant moderate positive correlations between respondents' adolescent self-concepts as music educators and parents' belief in their children's potential educational or professional success. McClellan indicated that demographic factors, including age, gender, ethnicity, SES, and parental education level did not account for a significant amount of variance in respondents' adolescent self-concepts as music educators, although the author acknowledge the role limited cell sizes may have played in these results. McClellan's findings lend additional support to the important part parents play in encouraging those individuals who end up in music teacher education programs. This study is limited by its retrospective nature, relying on respondents' adolescent memories of up to ten years prior to the point of survey

completion. Additionally, demographic inferences in this study are limited considerably by the demographic homogeneity of the sample.

In a 2010 pilot and 2013 expanded study, Rickels et al. investigated music educator career motivations by surveying pre-school of music acceptance undergraduate music education audition candidates. Descriptive statistics in the 2013 study showed that music education audition candidates ($N = 250$) were slightly more female than male (52.4%) and predominantly White (80.8%). The average age of audition candidates was 17.86 with a few older outliers positively skewing the mean, suggesting that most of the audition candidates were high school seniors. The candidate admission rate was 67.2%. The average grade that candidates reported deciding to major in music was ninth grade while the average grade for deciding to pursue a music education degree was eleventh grade.

Results from both Rickels and colleagues' 2010 pilot study and the 2013 study pointed toward high school musical leadership experiences as significant influences on audition candidates' decisions to pursue music education degrees. Additionally, candidates listed their high school ensemble directors and other music teachers as the most influential people in making the decision to pursue music education. Interestingly, parents were in the middle of the pack among people influencing candidates' decisions. While high school band, choir, or orchestra director (the most influential category) averaged 4.5 on a five-point Likert scale of influence, parents averaged 3.3 on the same scale.

Most audition candidates indicated intentions for teaching in like disciplinary areas as their high school ensemble experiences. Rickels et al. suggested that candidates'

"strong connection between [their] primary musical background and future teaching interest" (p. 125) may dissuade prospective music educators who do not identify with dominant high school large ensemble (band, orchestra, or choir) areas.

**Summary of degree and career selection.**

Scholarship suggests that most undergraduate music education students made their decision to pursue the field during high school, most likely in the latter half (Bates, 1997; Bergee et al., 2001; Madsen & Kelly, 2002). However, a sizable number of aspirant music educators decide to join the pathway during college, accounting for roughly one-quarter of music education students (Bergee et al., 2001; Madsen & Kelly, 2002; Isbell, 2008).

Research suggests that high school students pursue the music education pathway because of their love of music, their desire to work with people, and the calling to teach (Bergee et al., 2001; Bright, 2006). Among the external factors leading adolescents to pursue degrees or careers in music education, music teachers, parents, and other family members rank highly as key influential individuals (Bates, 1997; Rickels et al., 2010; 2013; Bright, 2006; Isbell, 2008; McClellan, 2011). Additionally, students' high school performance experiences, honor band participation, and leadership roles in their ensembles were among the influential experiences pushing students toward the field (Madsen & Kelly, 2002; Bergee et al., 2001; Isbell, 2008). It is likely that no single factor, but the combination of these influences, leads students to music education degree or occupational pursuit (Rickels et al., 2019).

Nicholas' active and involved parents provide a strong foundation for him to feel comfortable and confident in pursuing his passion. His positive experiences with his high

school band director and his feeling of accomplishment from earning section leader status and membership in honor bands reinforce his sense of musical leadership. Nick's positive support structures and sense of musical identity will serve him well as he sets his sights on pursuing a degree in music education.

## Nick's Story, Part 3

As Nicholas reaches the end of his high school years, his attention is set on college applications and audition preparations. After taking a college visit road trip with his parents during the summer of junior year and consulting with both his band director and private saxophone instructor, Nick has a shortlist of schools where he'll be auditioning during his senior year. His top choice, although out of state, has a nationally-recognized sax professor with whom Nick hopes to study. Once he reaches the college auditions, Nick is surprised by how many students he recognizes from his honor band experiences. Nick's parents and private instructor have been instrumental in helping him pull together all of the materials required for each of the applications and auditions. He has talked to his parents about the increased expense out of state college would mean and they have assured him that, absent scholarship support, they'll support him wherever he is admitted.

## Gateways and Barriers to Postsecondary Music Education

Below I discuss some of the gateways aspirant music educators must pass through in order to gain entry to a postsecondary degree program. Because music education degree programs are primarily found in schools of music, the school of music audition process features prominently in music education degree gateway literature. Although some have pointed toward alternative certification programs as a means of circumventing potential bottlenecks in the credentialing process (Asmus, 2003; Henry, 2005; Kimpton,

2005; Hellman et al., 2011), I omit alternative certification literature here because this alternate path to a career in music teaching is beyond the scope of my analyses.

Although not an empirical study, Koza (2008) explored potential inherent racial bias in gateway audition processes at postsecondary schools of music. The author recounted her personal experiences sitting in vocal auditions at her home institution, the University of Wisconsin-Madison, where she witnessed systematic culling of the populations being allowed admission to the school of music. Koza explained that, though admission performance standards remain very high insuring high caliber vocalists in the program, the standard by which audition candidates are measured is skewed in favor of affluence, Eurocentric cultural normativity, and Whiteness. The author suggested that a shift toward private instruction among high school vocalists—a nearly universal implicit prerequisite for instrumental music majors—has created an economic hurdle eliminating from the competitive pool vocal applicants whose families have not made this investment. Further, Koza asserted that the institution's strict reliance on Western Art Musics (WAM) as the only "acceptable audition music" (p. 150) subtly works to undercut racial diversity by "discount[ing] genres having deep roots in non-White musical traditions" (p. 149). Koza argued that these combined economic and cultural barriers create an audition system that predictably favors Whiteness and affluence over otherness. The author underscored the impact this systemically inequitable process could have on eliminating diverse music teacher applicants—all of whom must also clear the audition hurdle—from the pool, thus supporting a cycle of homogeneity among current and aspirant music teachers. Koza speculated that her experiences at UW-Madison are

likely reflective of the audition situations at many, if not most, of the major schools of music across the country.

In an autoethnography of his experiences as a Black man making his way through the music education progression from K-12 student to music teacher educator, Thornton (2018) called attention to the uniqueness of his place as a person of color in the upper echelons of the field by poignantly asking the question "why just me?" Thornton detailed, through a series of "epiphanies" (p. 46), the conditions and experiences that helped him gain access to, persist, and succeed in the field. Thornton pointed to the positive impact growing up in a well-resourced and racially diverse school district had on his outcomes. However, he highlighted in-school racial and socioeconomic segregation that affected many of his peers whose parents, unlike his own, lacked the "advocacy muscles" (p. 50) to get their children into the higher tracks. Thornton underscored his ability to code switch between his Black family and community and predominantly White sociocultural structures as an important tool for navigating education and society. Thornton credited his persistence in pursuing and achieving first undergraduate and then graduate degrees to the college readiness his parents, teachers, and out-of-school enrichment opportunities provided him. Thornton proposed a four stage strategy to address pipeline, access, and underrepresentation issues in music education. The first stage concerns college readiness among underrepresented groups. Thornton's college readiness program for prospective music educators includes (a) providing access to private lessons, (b) music theory classes, (c) academic tutoring, (d) college visits, (e) admissions and audition coaching, and (f) support for attending prestigious summer music programs. The next three stages of

Thornton's strategy outline steps for recruiting and grooming promising individuals from underrepresented populations for music teacher education faculty positions.

Fitzpatrick, Henninger, and Taylor (2014) used an instrumental case study to explore music education degree access and retention experiences among populations traditionally marginalized from the field. The authors interviewed six undergraduate music education students, each of whom claimed status as a person of color, identified as LGBTQ, and/or was a first-generation college student. Fitzpatrick et al. collected additional data from interviewing each participant's "favored high school music teacher" and a "university-based mentor" (p. 110). The authors identified a number of themes relating to the importance of prior experiences, access to recourses, supportive figures, and socialization on which the participants relied. Participants described both "enabling" and "inhibiting" factors that they experienced in the audition and application processes. Unfamiliarity with the application process, racially homogeneous student and faculty populations, and negative feedback from high school teachers all served as inhibiting factors for the students while parental emotional support and supportive mentors and friends served as enablers. Although the authors did not intentionally target socioeconomic status as an area of inquiry, participants expressed the challenges their lack of access to economic and cultural capital presented when pursuing the field. Participants described friends or mentors who could help navigate extracurricular experiences and the audition and college application processes as "invaluable" to their persistence and success. Findings from this study underscore the potential access barrier of being the other in the music education field and the uphill climb marginalized populations make to gain entry and persist through the degree.

**Summary of gateways and barriers.**

Individuals from outside of dominant population or cultural demographics may experience additional barriers and gateways impeding their progress into and through the music educator pathway (Fitzpatrick, Henninger, and Taylor, 2014; Thornton, 2018). Lacking familial institutional knowledge may impede navigating college application processes (Fitzpatrick, Henninger, and Taylor, 2014; Berglin, 2018), while lacking certain cultural capital may set some at a competitive disadvantage when auditioning for acceptance to schools of music (Koza, 2008). If the school of music audition process functions as a racial, cultural, and class-preferential selection tool, as Koza (2008) suggested, this process presents a barrier for those who either do not or cannot conform to the select profile. While others, in addition to Koza, have written speculatively (Bowman, 2007; Palmer, 2011) about the possible barrier auditions pose for marginalized populations, little empirical research exists showing the impact that these processes have on school of music population outcomes.

The differential and othering experiences certain populations face leading up to and through the secondary-postsecondary transition (Fitzpatrick, Henninger, & Taylor, 2014; Thornton, 2018) could play a role in bolstering racial, ethnic, socioeconomic, and cultural marginalization in the field. Thornton (2018) experienced persistent tracking mechanisms hindering his educational progression. His awareness of these systems, his parents' wherewithal to push back and supplement his education, and his ability to code switch and conform, when needed, to dominant power structures helped him persevere into his position in higher education.

Nick approached his college applications and auditions supported by his family's experiences in higher education and his private sax instructor's knowledge of what a successful college audition looks like. He was largely unaware of the tremendous challenge these processes posed for some of his peers without access to these invaluable resources.

### Nick's Story, Part 4

Although his application was rejected at his top school, Nick was accepted and is pursuing a music education degree at an in-state school a couple of hours from where he grew up. Even though it's the first time in his life that Nicholas has been the last chair in his section, he's grateful for the daily experiences he has making music at a high level. He's built a tight circle of fellow music education majors who he relies on for support through the program. His course load is seemingly double the schedule his roommate Lenny, a political science major, has. Lenny's excess of free time often keeps Nick up late as Lenny loudly plays video games in their close-quartered dorm room. By October of freshman year, Nick's grades are slipping a bit—an outcome he attributes largely to Lenny's distractions. Nicholas enjoys the music education coursework, but struggles in seeing the relevance of the music theory and music history classes to his professional ambitions. Nick dreams of landing a job directing high school band in a program similar to the one he attended. While he knows he's not going to get rich from his future career, Nick is excited about sharing his passion for music and performance with the next generation.

## Postsecondary Experiences

Here I present scholarship detailing undergraduate experiences in music education and how the experiences relate to persistence, attrition, and career expectations. Because

the undergraduate music education pathway so closely intertwines with and then often diverges from the music performance pathway during the undergraduate years, I include below some comparative literature juxtaposing these two populations.

**Music education degree-seekers.**

Brown and Alley (1983) examined degree persistence among 201 undergraduate students at a major Southeastern state university who were enrolled in a first year music education course in either the 1978 or 1979 fall semester. The authors collected demographic data, academic achievement scores, and teaching competency assessments for these students as potential predictors of persistence. At the end of the 1981 fall semester, Brown and Alley coded students into one of six possible outcomes: (a) graduated, (b) still enrolled as a music education major, (c) still enrolled as other type of music major, (d) still enrolled in major outside of music, (e) withdrew voluntarily, or (f) academically dismissed. Results showed that first year college enrollees who entered the program in 1978 had a 62% rate of attrition from the degree, while those entering as first time college students one year later had a markedly lower attrition rate (39%). Transfer students, on the other hand, showed lower attrition rates overall—37% and 31% from the 1978 and 1979 classes, respectively—suggesting that these students may have a "stronger commitment" to the degree, as Brown and Alley explained (p. 276). In both years, the entering music education students evinced higher average high school GPAs than the overall university average. The authors found moderately strong positive correlations between college GPA and persistence across both transfer and first time students who entered in both years. Stepwise multiple regression revealed college GPA as having the

greatest contribution to persistence variance with higher GPAs resulting in a greater likelihood of persistence.

Citing a perennial shortage of string teachers and an upward trend in school orchestra participation, Gillespie and Hamann (1999) sought to support string teacher recruitment efforts by gathering baseline data on students who were currently pursuing string teacher education. Drawing on a sample of 17 universities across the country, the authors surveyed 153 undergraduate and graduate music education majors whose primary instruments were orchestral strings. The survey asked the students about their career intentions and reasons for choosing string music education career trajectories. A majority (69%) of respondents indicated plans to teach immediately following graduation. Among those not pursuing teaching careers, the most frequent alternatives reported were graduate school, university positions, and professional performance aspirations. When asked about reasons for pursuing a string teacher education degree program, respondents most frequently reported they liked the teaching profession or found the work rewarding (10.8%), enjoyment of music (10.6%), desire to share music with others (9.4%), and love of children or people (9.1%). Less frequent responses included influence of an orchestra teacher (7.2%), influence of a private teacher (3.7%), and job market security (6.8%). The authors noted the importance of the K-12 string education pipeline in supplying the next generation of string educators and string education programs underscoring the important role string teachers play in recruitment to the field.

Thornton and Bergee (2008) surveyed 242 undergraduate music education majors at major schools of music in order to explore degree and career recruitment factors among this population. Using a survey derived from Gillespie and Hamann's (1999) prior

work, the authors asked respondents about career intentions, influential people in making degree and career decisions, and demographic information. Results showed nearly two-thirds of respondents were female (63%) with the sample skewed slightly toward students near the end of their undergraduate degree (*m* = 21.6 years old). Unfortunately, this study was absent any demographic information beyond sex and mean age. The vast majority of respondents (81%) reported that they began their college careers as music education majors. Among the remaining 19% who started in a different degree, nearly half switched into music education from another music degree. Seventy percent of respondents who moved into a music education degree during college did so within their first two postsecondary years. When asked about career intentions, a majority of respondents (70%) indicated that they would pursue music teaching careers after graduation. Among the other post-degree plans respondents indicated were graduate school (13%) and performance or other professional music jobs (4%). Five percent of respondents indicated their intention not to pursue any sort of music profession after completing their degree. When asked in an open response item about their influences for choosing to pursue music education the most frequent response category was "influence of important others" (24%) followed closely by "love of music (20%). As supported in prior literature, (Gillespie & Hamann, 1999; Bergee et al., 2001), music teachers made up the overwhelming majority (86%) of influential others reported. Fewer respondents (11%) reported "love of teaching" as an influence on pursuing music education while even fewer (4%) indicated pursuing the field for "job security" (p. 12). Despite the authors' proposition that this study may inform strategies toward recruiting higher quality music teacher candidates, the study itself is limited to only informing population replication strategies. By

investigating only individuals who are currently pursuing music education degrees, Thornton and Bergee's study runs the potential risk of doubling down on implicit biases in the field in favor of certain over-represented characteristic profiles.

While investigating cultural and demographic factors driving teaching placement preferences, Kelly (2003) completed a relatively large survey of 406 undergraduate music education majors at large universities in Florida, Nebraska, Ohio, and Pennsylvania. In addition to respondent demographic questions, the survey included questions about the demographics and characteristics of the primary and secondary schools that respondents attended. The respondent sample was 58.6% female and 83.7% White. Kelly reported that nearly three-fifths (59.9%) of respondents indicated that their parents' combined annual income was greater than $51,000 while only about a sixth (16.7%) reported annual family incomes less than $30,000. Unfortunately, the parental income question on Kelly's survey topped out at "$51,000 or higher" (p. 42) precluding deeper investigation into economic stratification within this population. The author indicated that "most students attended suburban public schools" (p. 45), however he did not quantify these results. Respondents self-reported that the K-12 schools they had attended were "overwhelmingly Caucasian in composition" (p. 45) with the mean estimated racial composition reported as 66% White. This finding is interesting when contextualized in the White American tendency for over-estimating racial/ethnic minority populations as discussed in demographic innumeracy literature (Nadeau, Niemi, & Levine, 1993; Siegelman & Niemi, 2001). When asked about the quality of their K-12 music programs, just over a third (36%) described their elementary programs as "Excellent" or "Superior." This number rose to just over half (51%) when respondents were asked about their

middle school programs and jumped to 70% when considering their high school music programs. In all, most respondents described their high school music programs as large (over 120 enrolled students) and well-resourced with a variety of musical enrichment activities and experiences available to them. Unsurprisingly, when asked about the types of schools in which they would like to intern, most respondents indicated similar characteristics—large, suburban, majority White, comprehensive music programs—to the schools they had attended. Only two respondents in 406 indicated that they would be interested in interning in a school that was majority racial/ethnic minority students.

In an examination of individuals taking the Praxis II music teacher licensure test between 2007 and 2012 ($N = 20{,}521$), Elpus (2015a) found systematic disparities along demographic lines among both test takers and test scores. Findings suggested that licensure candidates were predominantly White (86.02%) with people of color significantly underrepresented among test takers. Elpus demonstrated significant relations between test score and race, sex, ESL status, and high school GPA. Being White, male, a native English speaker, and having a strong high school GPA were all significantly associated with higher scores on the music teacher licensure test. Additionally, the study showed a significant impact on Praxis II scores associated with whether or not the individual had ever enrolled in a music teacher education program. Elpus' findings point to the potential bottleneck this professional gateway exam may pose for individuals who evince a different demographic profile from what Elpus described as a "highly selected subset of the population" (p. 314).

DeLorenzo and Silverman (2016) pointed out that the music education degree program at their home university failed to reflect the racial and ethnic diversity of the

state or even the rest of the university. They reported that although Black and Latino students made up 13.7% and 17.7%, respectively, of the New Jersey population and 10% and 13% of the authors' university population, these two groups comprised only 9% and 7% of the undergraduate music education majors at their institution. The vast majority (84%) of the 182 music education majors were White. In an effort to explain some of the racial and ethnic underrepresentation they saw in the field of music education at large, DeLorenzo and Silverman investigated the experiences of three current undergraduate music education students and four alumni of their institution who were current public school music teachers. All seven participants identified as Black, African American, Latino, or Hispanic. From surveys and interviews, the authors created a profile of each participant's experiences entering and persisting in the field. Participants reported the sense of "culture shock" they felt making the transition from majority racial/ethnic minority urban high schools to the "predominantly White college climate" (p. 12). In interviews, participants described this otherness as a sense of feeling "left out" from the field (p. 13). The participants pointed to salary considerations as a key factor driving high school students of color away from relatively low-paying music education career tracks. As the expected future breadwinners in their families, participants relayed pressure from their families to pursue more lucrative careers. Within the music education degree program, DeLorenzo and Silverman relayed that participants disparaged the lack of course materials that were directly relevant to their urban school experiences. Participants cited the "disconnect" between what their White peers knew and learned in the degree program and "what the inner city kid experiences" (p. 18). The authors suggested that music education in many urban schools is devalued by a lack of investment in critical

resources such as materials, facilities, and private instruction. This under-investment, DeLorenzo and Silverman posited, creates an "impossibly rugged terraine [sic]" urban students must traverse "just to open the door let alone successfully complete a degree program" (p. 19). While DeLorenzo and Silverman's study is limited by the scope of their sample, the work brings an important critique to the field from all too commonly missing voices.

Berglin (2018) focused his dissertation on comparing the lived undergraduate music education experiences between under-represented racial/ethnic minorities ($n$ = 8) and their well-represented peers ($n$ = 8). Using a multiple-case study, Berglin paired each racial/ethnic minority participant with a well-represented peer from the same university in order to juxtapose how each participant navigated their pursuit of the music education pathway. While participants from both under-represented and well-represented groups shared some similarities in their educational trajectories and daily experiences as music education students, Berglin found key differences relating to race and social class identity in the ways students approached and experienced the degree program. In addition to themes associated with race and class, Berglin found intersectional themes in the relationship between these two facets. Berglin reported the contrasting ways participants from different backgrounds discussed the roles family, religion, and financial resources played in their pursuit of a music education degree. Berglin described the often contrasting challenges to persistence participants faced dependent on their racial or class status. Berglin noted that lower SES participants, particularly first generation college goers, emphasized the substantial challenges posed by college admission and audition processes without parental experiences to guide them. Racial/ethnic minority participants

relayed a greater sense of racial awareness than their White peers describing formative experiences with "racial disharmony" stemming at least as far back as their secondary school experiences. Berglin underscored the importance of considering the intersectional nature of race and class when interrogating factors influencing underrepresentation in the field.

**Juxtapositional literature.**

In order to better understand the career motivations among music majors, Parkes and Jones (2011) surveyed 270 undergraduate music and music education students at seven schools of music around the country. Approximately one-third of respondents ($n$ = 91, 33.7%) identified as aspirant performers while the other two-thirds planned to teach music. This particular iteration of the study focused exclusively on the former group of aspirant performers. Just over half of the performance major sample was male (51.4%) and a vast majority were White (82.4%). Respondents completed an online questionnaire which included an open response item asking students what their main reasons were for considering a career in music performance. The entirety of this iteration of the authors' study is based on responses to this open response item. Parkes and Jones generatively assigned thirteen codes to responses which they grouped into one of four themes: enjoyment of musical performance, musical ability or lack of teaching ability, usefulness to the community or the art form, and identity as a musician. Enjoyment was the most frequently occurring response code accounting for nearly three-quarters of responses (71.2%). Responses relating to performance ability made up 16.7% of the coded responses while those responses coded as usefulness and identity each accounted for about 6%. The authors contrasted the responses they received with prior literature

regarding music education career choices finding that while both aspirant performers and educators enjoy sharing music with others, aspirant performers appear to be less concerned than aspirant educators with making a difference in other people's lives. Broadly cast, these results paint performance majors as largely hedonistic and self-indulgent with a minority considering the practicality or utility of their craft. This study is quite obviously extremely limited by the authors' sole reliance on a single question to explore the many factors influencing music performance career selection.

In work reminiscent of their prior two collaborative studies, Parkes and Jones (2012) looked into motivational predictors of undergraduates' pursuit of either a music education or music performance degree. Parkes and Jones collected survey responses from 270 undergraduate music students enrolled at one of seven universities. The combined sample was just over half female (55.4%) and overwhelmingly White (88.1%). The authors examined music education majors ($n$ = 143) and music performance majors ($n$ = 91) from the perspective of expectancy-value theory in order to understand which motivational constructs were at work in determining pursuit of one of the two majors. Although the students were sorted by major, Parkes and Jones used participant-reported likelihood of pursuing a music teaching job and reported likelihood of pursuing professional performance to assign students into aspirant music teacher and aspirant performer groups by degree of likelihood. The authors reported a moderately weak negative correlation between the likelihood of teaching music and the likelihood of becoming a performer. Results showed attainment value as responsible for the most variance (69%) in the likelihood to pursue a music teaching career while expectancy predicted the most variance (54%) in likelihood of pursuing a performance career. Parkes

and Jones pointed out that consistently high average ratings from both groups for the social utility value of teaching music suggest both aspiring performers' and music educators recognize the "important service to society" (p. 113) that music teachers provide. High ratings for intrinsic interest value for performance suggested enjoyment of the craft as a primary motivator toward pursuing a performance career.

Allen (2003), using a small convenience sample ($N = 30$) of undergraduate music education and music performance majors, explored vocational identity formation and stability among the two populations over the course of their first three years of college. Allen employed the *My Vocational Situation* diagnostic test, developed by Holland, Daiger, and Power (1980), to assess vocational identity at five times over the course of the three year period. The diagnostic test rated students' sense of concordance between their identity and their occupational tracks on an 18 point scale, 18 being the strongest sense of vocational identity. Results showed music performance majors with a higher average vocational identity (14.6) than music education majors (12.8) at the start of college. However, over the course of three years, music educator vocational identity steadily rose while performance major identity steadily declined. By the end of the students' third spring semester, music educators had an average vocational identity score of 15.7 while performance majors averaged 9.3. Additionally, the performance major group had nearly 50% attrition from the study in contrast to 20% attrition by music education majors. However, it is unclear whether or not these results evidenced any larger patterns among the majors. Allen posited that the inverse relationship between music majors' and performance majors' sense of vocational identity could stem from a growing sense of employment realities as students progress through college. He

suggested that, while music education majors can rely on relatively stable job prospects, performance majors may face a great deal of employment uncertainty once they graduate.

In an investigation of racial/ethnic and gender diversity within Big Ten schools of music, Grisé (2019) found significant disparities between some subsets of school of music and university populations. Grisé drew on a convenient sample of five Big Ten institutions using school of music demographic data from the Higher Education Arts Data Services (HEADS) paired with university demographics from IPEDS. Findings showed undergraduate populations at these schools of music were, in terms of race/ethnicity, either more diverse than or statistically representative of their university populations while school of music faculty populations were consistently less racially and ethnically diverse than their colleagues in the rest of the university. Males outnumbered females nearly universally among undergraduate, graduate student, and faculty school of music populations. While aggregated data from twelve Big Ten schools of music showed significant male over-representation at all three levels, most of the individual school results suggesting female under-representation failed to reach statistical significance. Although there was certainly potential selection bias from the schools of music who opted to participate in the study, Grisé's findings, at the undergraduate level, run counter to the supposition that schools of music are racially or ethnically less diverse than universities at large.

Using a subsample of data from the National Longitudinal Survey of Youth, Montmarquette, Cannings, and Mahseredjian (2002) investigated the likelihood of degree selection and completion between business, liberal arts, science, and education majors ($n$ = 562). The authors explored the roles demographic, socioeconomic, educational, and

regional characteristics played in selection into and completion of the four degree areas. The subsample was just over half male (54%) and predominantly White (85%). Within education degrees, the authors found gender, vocabulary test scores, and region to be significant predictors of successfully completing the degree program. Being female, scoring higher on a vocabulary test, and living in the South were all significant predictors of completing an education degree. The authors determined living in a metropolitan statistical area and having attended public K-12 school as significant predictors of successfully completing a liberal arts degree. There were no other significant predictors associated with completing either of these degree areas. Of the four degree areas, individuals in education and liberal arts degrees reported the lowest and second lowest expected earnings, respectively. Men reported consistently higher expected earnings in all four degree areas. The authors suggested that young people likely weigh perceived completion likelihood against expected earnings when making postsecondary degree pursuit decisions.

**Summary of postsecondary experiences.**

Similar to the reported reasons undergraduate music education students entered the degree, research suggests many of these students persist supported by their love of music and desire to share it with others (Gillespie & Hamann, 1999; Thornton & Bergee, 2008; Parkes & Jones, 2011). The music education student identity profile contrasts somewhat with that of music performance majors with research suggesting the former group gives more consideration to how they will contribute to society while the latter group focuses more attention on personal need fulfillment (Parkes & Jones, 2011; Jones & Parkes, 2012). Allen's (2003) work juxtaposing performance major and music

education major vocational identity alignment further supports the notion that individuals on either side of the performer/educator dichotomy view their future careers with differing expectations. As could be inferred from Montmarquette, Cannings, and Mahseredjian's (2002) research, music education majors with clearer earnings prospects facing them post-graduation could have stronger persistence motivation than their less economically certain performance major peers.

As previously discussed, roughly a quarter of undergraduate music education students join the degree during college, most of whom join sometime in the first two years (Thornton & Bergee, 2019). There is some evidence to suggest that these late joiners may have a lower rate of attrition than those who start the degree during their first year of college (Brown & Alley, 1983), although others have expressed skepticism of later commitments to the field (Madsen & Kelly, 2002).

Similar to the access gateways and barriers discussed above, marginalized populations may encounter barriers to persistence during the music education degree program (DeLorenzo & Silverman, 2016; Berglin, 2018). A sense of otherness within racially, ethnically, or culturally homogeneous schools of music may strain and isolate degree-seekers from under-represented groups. Despite evidence to suggest undergraduate music major populations may be more diverse than previously assumed, entrenched faculty racial and ethnic homogeneity could dictate assimilationist norms over diversity ideals (Grisé, 2019). Furthermore, Elpus' (2015) profile of music teacher licensure candidates could suggest that predominantly White undergraduate music education populations contribute little to school of music racial diversity.

Although Nicholas has encountered some setbacks and challenges throughout his music education degree, he has never doubted his place in the program. Nick relies on strong support networks made up of his family and his peers to negotiate the challenges he encounters. His strong sense of future occupational identity is rooted in his clear sense of what his probable job will be upon graduation.

### Nick's Story, Part 5

Nicholas graduates with a Bachelor's degree in music education and earns his teaching credential from the state. Despite being certified to teach music at any level, Nick still considers himself a secondary band guy. He was hoping for a high school teaching job, but he lands a pretty good position as the instrumental music specialist at a middle school a couple towns over from where he grew up. Now a professional in the field of his dreams, Nicholas reflects back on all of the hard work and good fortune that have brought him to where he is.

## Professional Populations

Literature detailing the demographic profile of K-12 music teacher populations is limited. The few studies discussed below suggest that the end point of the pathway processes previously presented is a predominantly White and female music teacher population profile. In addition to music education teacher population research, I include a brief discussion of some of the scholarly discourse around this topic concerning professional performer populations and educator population research at large.

Hancock (2008) used data from the 1999-2000 Schools and Staffing Survey (SASS) to investigate attritive and migrational risk factors among practicing music teachers ($N$ = 1,931). This dataset is nationally representative of the 130,675 individuals who were K-12 school music teachers during the 1999-2000 school year. In describing

the population of interest, Hancock reported that roughly three-fifths of music teachers (60.9%) were women. The most frequently reported age group among this population, accounting for about a third of music teachers (33.6%), was 40-49 years old. Just over one half (51.5%) of the music teachers worked in suburban schools while about a quarter worked in either urban (25.3%) or rural (23.2%) settings. Hancock did not report race/ethnicity frequencies in descriptive statistics. Using sequential logistic regression, Hancock found a number of significant predictors leading to attrition or migration including issues with low salary, limited support from administrators or parents, and being younger than the modal age of the population. Additionally, Hancock showed that, when controlling for school factors and teacher efficacy, females and racial/ethnic minorities were at a higher risk for attrition or migration than their White male colleagues. Hancock's findings provide some explanation of the systems at play in thinning the diversity of the field after the point of teacher credentialing.

Gardner (2010) investigated the teacher attributes, perceptions, job attributes, and school characteristics that contribute to K-12 music teacher attrition and migration. Using data from the 1999-2000 *Schools and Staffing Survey* (SASS) and the 2000-2001 *Teacher Followup Survey* (TFS), Gardner compared music teacher ($n$ = 1,903; 4%) conditions and characteristics to those of non-music teachers ($n$ = 45,954). Descriptive statistics in the study revealed that music teachers were less frequently female (61%) than other types of teachers (75.7%) and more frequently White (89.6%) than other types of teachers (84.9%). While findings showed that music teachers have comparable retention, attrition, and turnover rates to other kinds of teachers, Gardner pointed to a key difference between the populations. Gardner's findings revealed that music teachers were significantly more

likely than their non-music colleagues to hold part time or itinerant positions, teaching between multiples schools which the author suggested could lead to higher levels of teacher burnout. Additionally, these results underscored the important role administrative support plays in music teacher retention.

**Performer populations.**

In a practitioner-focused think piece, DeLorenzo (2012) called attention to the racial and ethnic homogeneity within American orchestras. Pointing out the "missing faces" from these ensembles from schools to professionals, DeLorenzo underscored the implicit challenge to social justice neglecting under-served Black, Latino, or lower socioeconomic populations poses for the field. Calling for "equal opportunities" for students of any race "to make [the] choice" to pursue professions in Western Art Music (p. 42), the author decried the gap in scholarly understanding of the mechanisms at play keeping people of color out. She suggested the roles music educators, arts supervisors, and teacher educators play in recruitment of diverse populations as pivotal to stemming the tide of underrepresentation in the field.

**Teacher populations.**

Guarino et al. (2006) conducted a systematic review of teacher recruitment literature including 46 empirical studies concerned with U.S. teacher labor markets between 1990 and 2004. The authors found a "fairly consistent" demographic profile of the types of people who pursue the teaching profession (p. 179). As of the mid-1990s, women (73%) outnumbered men among those graduating college and pursuing the teaching profession, although research suggested a slight downward trend in the number of women entering the profession (Broughman & Rollefson, 2000). Guarino et al. found

that, despite the rise in racial/ethnic minority student populations in the country in the 1980s and 1990s, the entering teacher workforce "did not keep pace" in reflecting this diversity (p. 180). Data from the 1993-1994 Schools and Staffing Survey (SASS) showed that 84% of new teacher hires were White non-Hispanic (Broughman & Rollefson, 2000). Research investigating Praxis I outcomes in the mid-1990s (Gitomer, Latham, & Ziomek, 1999) showed that White candidates passed at the highest rate (87%) while Black candidates passed at the lowest (53%). Praxis II scores showed a similar trend with White candidates passing at the highest rate (92%) while Black candidates, again, passed at the lowest (65%). Qualitative data (Gordon, 1994) suggested that racial/ethnic minority teachers believed students of color were discouraged from the field by a negative perception of the profession or an incompatible racial image of who becomes a teacher. Guarino et al. pointed to multiple studies suggesting that higher academic achievement translated to lower likelihood of pursuing the teaching profession. The authors found a trend in the research suggesting that individuals either in or pursuing the teaching profession tended to value their potential contribution to society higher than non-teachers did. Similarly, Guarino et al. pointed to research (King, 1993; Shipp, 1999) that showed salary was a lower priority job consideration among the teaching population, suggesting that teachers and prospective teachers may tend toward altruism over more self-serving pursuits.

Reininger (2012) used data from the National Educational Longitudinal Study (NELS) to examine teacher sorting as determined by educators' geographic mobility. Using professional preferences individuals expressed during their high school years regarding proximity to home, earning potential, and altruism, Reininger was able to

profile the predictive role geography may play in who pursues teaching careers. The author showed that the geographic mobility patterns among young teachers were different from other college graduates. By examining a subset of the NELS cohort made up of college graduates, high school graduates, and teachers, Reininger showed that teachers, while seeking employment, tended to stay geographically closer to the secondary schools they attended than did other types of college graduates. Reininger suggested that young teachers' proclivity to seek employment near where they grew up could be playing a systematic role in exacerbating and perpetuating staffing challenges at chronically difficult to staff schools. Reininger defined "hard-to-staff schools" as those with at least 75% racial/ethnic minority enrollment or 50% of students receiving free or reduced price lunch (p. 131). Reininger's findings regarding teacher immobility provide some explanation of the difficulty of staffing schools that may produce aspirant teachers at lower rates.

**Summary of professional populations.**

Research indicates a few frequently shared traits among music teacher populations. Professional K-12 music educators are more likely to be female than male, with women outnumbering men in the profession roughly three to two (Hancock, 2008; Gardner, 2010). However, female over-representation in the field is slightly lower than in teacher populations overall (Guarino et al., 2006; Gardner, 2010)—an outcome possibly driven by the high proportion of men likely to be holding band director jobs (Bright, 2006; Elpus & Abril, 2019). Empirical evidence suggests that music teachers are even Whiter than the already predominantly White K-12 teacher population (Gardner, 2010). In addition to the pipeline mechanisms outlined in previous sections, the higher

professional attrition risk experienced by women and people of color in music teaching jobs (Hancock, 2008) may play a part in explaining these demographic profiles. There is some evidence to support the notion that many of the access issues music educators face are shared by those on the professional musician pathway (DeLorenzo, 2012), particularly in sub-disciplines moving through school of music gateways. However, further inquiry into the factors shaping the professional musician workforce would be needed to more fully characterize this particular population.

## Nick's Story, Conclusion

Nick made it through. His story serves as an archetype for an aspirant music educator. His progression from high school music student to undergraduate music education student to credentialed and employed music teacher serves to illustrate many of the variables involved in persistence through the pathway. Were there some ideal school characteristics and personal supports along the way—advantages not afforded to some of his peers—that helped to keep Nick on the pathway? Could he attribute much of his success to the hard work he's put into persisting and reaching his educational and professional goals? Were there very real unobserved challenges Nick had to face and overcome that go unaccounted in the scholarly literature? Will Nicholas likely make a good band director? The answer to all of these questions is likely "yes." Nick's story is complex and cannot be distilled down to a few key characteristics or circumstances. An explanation for his persistence along the pathway is multifaceted, relying on intermingled demographics, environmental influences, Nick's own contribution to his success, and the myriad unobserved factors that served as supports for and challenges to his pursuit of the music teaching profession.

## Summary of the Literature

This literature review has outlined the scholarly body of knowledge regarding the progression from high school student to professional music teacher. When viewed overall, the progression from aspirant to professional music educator appears to favor certain characteristics while inhibiting others. People of color and individuals from lower socioeconomic strata are underrepresented among participants in, and may have limited access to, formative secondary music experiences—demographic trends that continue into postsecondary populations. The importance of parental support in making degree and career decisions and navigating the application and audition processes features prominently in the literature. Those pursuing the music educator pathway are passionate about their craft, their impact on others, and their contribution to society. The population who makes it through to become K-12 music teachers resembles the predominantly White female teacher population at large, but is slightly Whiter and slightly less female. Table 2.1 below summarizes gender and race demographics found in the scholarship above. While slight female majorities remain relatively stable along the music education pathway, these accumulated results suggest Whiteness gradually increases at each stage from high school music student, to degree seeker, to professional.

Table 2.1
*Racial and gender music education pathway population demographics as reported in prior research.*

| Study by stage | Percent White | Percent Female | *N* | Data Source |
|---|---|---|---|---|
| **High school music students** | | | | |
| Stewart (1991)* | 78.6 | 61.4 | ~60,000 | HS&B |
| Rickels et al. (2019) | 79.6 | 53.5 | 157 | 2 music summer camps |
| Elpus & Abril (2019) | 58.0 | 60.0 | ~25,000 | HSLS |
| Elpus & Abril (2011)† | 65.7 | 61.0 | ~13,420 | ELS |
| **Music education audition candidates** | | | | |
| Rickels et al. (2013) | 80.8 | 52.4 | 250 | 8 university survey |

| | | | | |
|---|---|---|---|---|
| **Music education undergrad students** | | | | |
| Bergee et al. (2001)‡ | 87.7 | 68.9 | 431 | MENC member survey |
| Kelly (2003) | 83.7 | 58.6 | 406 | 4 university survey |
| Parkes & Jones (2010) | 90.2 | 56.6 | 143 | 6 university survey |
| McClellan (2011) | 78.0 | 54.7 | 148 | 2 university survey |
| DeLorenzo & Silverman (2016) | 84.0 | - | 182 | 1 university count |
| **Music teacher licensure candidates** | | | | |
| Elpus (2015a) | 86.0 | 56.0 | 20,521 | Praxis II data |
| **K-12 music teachers** | | | | |
| Gardner (2010) & Hancock (2008) | 89.6 | 61.0 | 1,903 | 1999-00 SASS & 2000-01 TFS |

*Note*. *White (non-minority) in this study included Asian; †Only includes HS seniors; ‡6.3% of the sample was graduate music education students.

## Gap in the Literature

Research points to systemic patterns of inclusion and exclusion from the music educator pathway. At each stage of the progression from aspirant to professional music teacher there are predictive demographic, environmental, and value structures associated with persistence through and attrition from the pathway. While qualitative research has given voice to the lived experiences of those traveling this path, and small-scale quantitative research has pointed to particular imbalances among pockets of populations seeking careers in music education, there does not exist a large-scale longitudinal investigation into persistence through and attrition from the pathway. Through examining longitudinal variance within music educator and parallel pathways by demographics and educational characteristics while accounting for the individual contributions motivating persistence, the present study may contribute to this body of knowledge by revealing a holistic depiction of the systematic mechanisms at work in deciding who makes it through.

# Chapter 3: Methods

In this chapter I discuss my analytic approach to answering the three research questions. I start the chapter with an explanation of how I arrived at secondary analysis as a chosen method of inquiry. Next, I explain my rationale for choosing the High School Longitudinal Study of 2009 for this study and the processes involved in preparing these data for analysis. Finally, I discuss my overall analytic design and how this approach will answer my research questions.

## Rationale for Secondary Analysis

Interrogating potentially systemic patterns in the pathways from high school student to postsecondary degree seeker required my use of a data-rich, nationally representative, longitudinal dataset. Because of the resource-intensive nature of collecting and maintaining this type of data, collecting novel data for this study was beyond my resource capacity. I opted, therefore, to approach my research questions from a secondary analysis of a pre-existing dataset. A fundamental challenge of secondary analysis is that the secondary analyst generally has no role in defining which data are collected or how those data are collected. Although secondary analysis precludes me, as the researcher, from having any say in data collection, the resource-efficiency of this approach enables me to make reasonable inferences at a scope and scale that would otherwise be beyond my means.

## Rationale for Using HSLS

The U.S. Department of Education has, for the past nearly 50 years, maintained ongoing longitudinal studies documenting the status of education in this country. At the time of this writing, the most recent of these studies is the High School Longitudinal Study of 2009 (HSLS). HSLS, as will be described in further detail below, has been

tracking a nationally representative cohort of roughly 25,000 individuals since their ninth grade year in 2009. To date, this still ongoing study includes four data collection waves spanning a seven-year time period. The most recent data collection wave ended in 2016 and the National Center for Education Statistics (NCES) was able to supply restricted-use data files including the recent data wave in early 2018. The relative novelty of these data make HSLS the ideal dataset for my investigation into the current conditions along the pathways of interest.

## HSLS Background

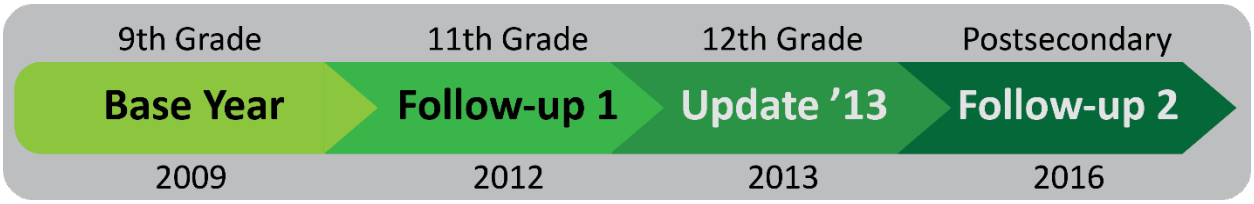
The High School Longitudinal Study of 2009 (HSLS) is a project of the National Center for Education Statistics (NCES), a center within the United States Department of Education. This multi-wave study comprises a nationally-representative sample of individuals ($N \approx 25{,}000$) who were first time ninth graders in 2009. Although the study is geared toward collecting data related to the pathways toward STEM fields, the depth and richness of the data set provides ample opportunity for secondary analyses beyond STEM-focused inquiry (Elpus, 2017; Elpus & Abril, 2019).

From a probabilistic national sample of approximately 940 public and private high schools that include both 9th and 11th grades, students were randomly sampled within each school for inclusion in HSLS. In an effort to maximize coverage, the school sample was derived by accounting for public/private designation, geographic region, urbanicity, and enrollment population. The student random sample of approximately 30 students per school was drawn from each high school using a stratified approach that took into account student race/ethnicity (Ingels et al., 2014). This complex survey design necessitates the use of prescribed survey weights in order to maintain national representativity and counteract the effects of clustering and over- and under-sampling

strategies (Miksza & Elpus, 2018; Heeringa, West, & Berglund, 2017). I discuss below in further detail how survey weights factored into my analytic design.

In addition to the base-year 9th-grade data collection in 2009, data were gathered in an 11th-grade first follow-up in 2012, a brief 12th-grade update in 2013, and a recently released 2016 second follow-up three years after anticipated high school graduation. During the base-year data collection and in each follow-up, individuals responded to a variety of questions covering demographic information, educational habits and perceptions, and professional intentions. These primary data collection waves also include parent, teacher, counselor, and administrator responses as well as high school characteristics. The 2013 update added complete high school transcripts to the dataset.

Figure 3.1. HSLS Data Collection Waves




NCES provides both public-use and restricted-use versions of HSLS. For this study, I used the restricted-use version of the dataset which comes with a plethora of federally-mandated caveats. The analytic dataset was required to be on an air-gapped and secured hard drive—at no time connected to any other systems via either the internet or any internal network. This study and all subsequent dissemination of this research must exclude exact counts and any individually identifiable information. Finally, all publications resulting from this research, including this document, require non-disclosure review by NCES prior to distribution to insure proper de-identification of restricted personal data.

## Dependent Variables

I constructed a database of novel dependent variables needed for my analyses in Google Sheets. Within this spreadsheet software, I was able to generate the hundreds of lines of Stata code needed to create each iteration and permutation of music, educator, and music educator pathway outcomes while maintaining uniformity of syntax. Below I describe how I created occupational or degree flag variables from each data collection wave.

### Occupational outcomes.

In the base-year, first follow-up, and second follow-up HSLS data collection waves, students were asked in an open response item what job or occupation they expected or planned to have at age 30 (Ingels et al., 2014, A-52). From these expressed occupational intentions, I needed to create dichotomous variables for aspirant music teachers, aspirant professional musicians, and aspirant non-music teachers at each data collection point. Although HSLS contains coded occupational intention variables using the U.S. Department of Labor, Employment & Training Administration's Occupational Information Network (ONET), ONET codes do not provide the level of specificity required to parse out music educators from other types of musicians, other types of arts educators, or educators in general. Because it was necessary for me to use the verbatim occupations as collected in the open response items, simple code matching would not suffice for identifying the populations of interest. I therefore created three automated search tools to identify within verbatim responses individuals whose self-described future occupations matched one of the three professional outcomes.

Each distinct search tool used regular expression search logic (Thompson, 1968) to identify prospective members of the respective pathways. Knowing I would manually

review the responses for all flagged members in each category, I erred on the side of inclusivity in the logic of each search tool. To account for potential conflicts between regular expression case sensitivity and capitalization variation in open responses, I converted all responses to capital letters. The structure of each search varied slightly by pathway type in accordance with the diversity of ways people describe professions within each field.

Drawing on my own previous research with this dataset (Grisé, 2018), the aspirant musician search tool included 157 keywords and likely (mis)spelled variants of those keywords (full list of keywords available in Appendix A). For music indicator words made up of common letter combinations that occur in non-music related words (e.g. "RAP" in "THE*RAP*IST" and "PHOTOG*RAP*HER"; "HARP" in "S*HARP*SHOOTER"), I created counter flags in order to isolate only occurrences of the intended musical words. I generated the original list of keywords in consultation with a number of fellow music education and music graduate students. I refined and expanded the list by cross-referencing the keywords with HSLS occupational intention responses expressed by individuals who would end up as music majors.

I employed a similar search technique as above using dyads of the words "MUSIC, BAND, CHOIR, CHORUS, ORCHESTRA" and "TEACHER, DIRECTOR, EDUCATOR" to identify aspirant music educators. Aspirant non-music teachers were identified using the search terms, "TEACH" and "EDUCAT." To capture school athletic coaches within the non-music teacher category, I also included the dyad "SCHOOL, COACH." Only individuals who responded to the occupational intentions question during each wave were included in these variables.

Using intended occupational response data found in the appendix of Councill's (2004) career perceptions study, I was able to test my three search tools on occupational intention responses from 6th to11th-grade music students. In 513 distinct responses to Councill's study, 40 responses were flagged as aspirant musicians, 11 were flagged as aspirant music teachers, and 44 were flagged as aspirant teachers. No flags were the result of a false positive match, lending credence to the reliability of the search tools.

**Degree outcomes.**

To identify postsecondary aspirations and degree involvement, I used HSLS-provided six-digit classification of instructional program (CIP) codes. Music education degrees conveniently fall entirely within the CIP code 13.1312. A keyword search for the term "music" in the CIP code search engine within the Integrated Postsecondary Education Data System (IPEDS) website yields 23 results. Among these 23, I identified 20 degrees to be valid music degree programs. One of those degrees was Music Teacher Education which I excluded from this set for the analytic purposes of this study. The other three degrees I excluded due to being out of scope were Digital Arts, Humanities/Humanistic Studies, and Medieval and Renaissance Studies. In an effort to represent the breadth of ways people contribute to a musical society (Small, 1998), I opted to include non-performance focused musical degree programs such as "Music Instrument Fabrication and Repair" (47.0404) and "Recording Arts Technology/Technician" (10.0203).

To isolate teacher education degrees, I performed two separate searches in the CIP code search engine for the words "teacher" and "education," respectively. The union of the two search results yielded 181 degree programs. In order to parallel music teacher education programs as closely as possible, I chose to bind the education category to

include only teacher education programs, excluding administrative or supportive educational degrees. From the initial 181, I determined 73 CIP codes to be valid teacher education programs. For a full list of included music and teacher education degrees, see Appendix B.

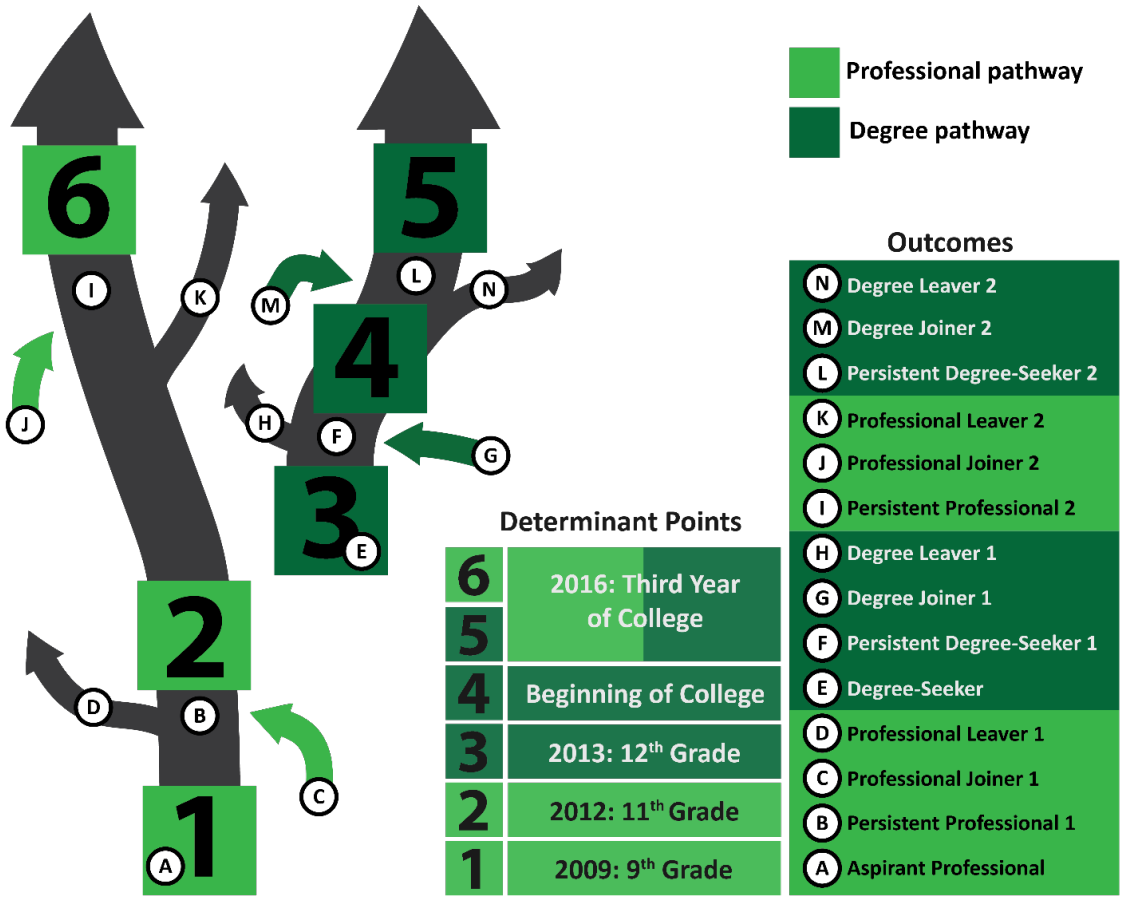
From the compiled list of music education, music, and education degree CIP codes, I flagged individuals in the dataset who indicated intentions to pursue one of the three degree tracks during either the 2013 update or the second follow-up data collection waves. During the second follow-up, collected during the third year of college, students were asked which major they were initially considering when they started college. Although this data-point is admittedly a potentially unreliable proxy, it is the closest estimation of early college degree intentions available within the dataset. Additionally, I flagged individuals who indicated that they were currently pursuing one of the degree tracks as either their primary or secondary major.

In order to make comparisons between the parallel fields, music educational career or degree intentions were treated as exclusive subsets of both the music and education tracks. However, individuals who expressed multiple career or degree intentions that aligned with more than a single pathway (e.g., “I want to teach high school chemistry or play in a band,” or a student who double majored in music education and music performance) were flagged for inclusion in each of the pathways to which they aspired.

Assembling the three occupational aspiration data points and the three degree pursuit data points across the three pathways allowed me to construct 14 distinct outcome variables within each pathway derived from entry to, persistence through, or attrition

from professional or degree program trajectories, as illustrated in figure 3.2 and described in more depth in the next section.

Figure 3.2. Possible Outcomes by Determinant Point




## Determinant Points

The goal of this analysis is to test three conceptions of justice at various points along the pathway from high school student to degree-seeker and/or professional. I used six determinant points (outlined below) along three parallel (music, education, and music education) pathways for a total of 18 longitudinal outcome determinations. I derive each

determinant point from either student-expressed occupational intentions or degree pursuit.

The first determinant point comes from students' responses in their ninth grade year to a question asking what occupation they would have when they turned 30. In the present analysis, students' responses to this question sorted them into one of four possible outcome categories: aspirant musician, aspirant educator, aspirant music educator, none of the above. This first determinant point serves as a baseline for career aspirations at the beginning of the high school experience.

The second determinant point reflects student occupational thinking three years later in their high school career and allows comparison with the first determinant point. This determinant point is based on students' responses to the same occupational question asked again in the first follow-up data collection wave during the third year of high school. Because I hope to understand persistence and attrition from each pathway, the outcomes in each successive determinant point are derived from students' outcomes in the previous determinant point. Therefore, there are three possible outcomes along each pathway in the second determinant point: 1) students who reiterated their intentions to pursue the occupation, who I call "persistent aspirant professionals;" 2) students who changed their occupational intentions from one of the pathways of interest to something else, termed "aspirant professional leavers;" and 3) "aspirant professional joiners," i.e., students who indicated pursuing the occupational pathway during the first follow-up data collection wave but had not done so in the previous base-year data collection two years prior.

The third determinant point, after the cohorts' modal twelfth grade year, mirrors the first determinant point in that this is when the cohort first indicated their college degree intentions. Therefore, there are only four possible outcomes at this determinant point: aspirant music major, aspirant music education major, aspirant education major, and degree-seeker in another field. The fourth category only includes college-bound students who indicated an intended degree program (including "undecided") and excludes non-postsecondary degree-seeking members of the HSLS cohort. I use this fourth category of other types of degree seekers as a point of comparison with the degree-seeking populations of interest in the analyses to follow.

The fourth determinant point comes from the second follow-up data collection wave, three years after high school graduation. However, in the timeline, this point is retrospective of when these data were collected. This point is derived from a question asking students to think back to the beginning of their college career and to indicate what their intended major was at that point, two years prior for most. I treat the outcomes for this determinant point in the same fashion as I did for determinant point two: persistent degree-seeker, degree-leaver, and degree-joiner.

The fifth and final determinant point in the degree-seeker side of the pathway comes from the second follow-up data collection wave during the third year after high school. At this point, HSLS data indicate students' currently enrolled (as of 2016) primary and, when available, secondary degree programs. Again, there were three possible outcomes per pathway at this point consisting of persistent degree-seekers, degree-joiners, and degree-leavers.

The sixth and final determinant point in the aspirant professional side of the pathway also comes from the second follow-up data collection wave. Here, students were asked once again about their intended occupation at the age of 30. As was the case in the second determinant point, there are three dispositions along each pathway comprised of 1) persistent aspirant professionals, 2) aspirant professional leavers, and 3) aspirant professional joiners.

With the aim of maximizing cell sizes for the sake of statistical power, at each determinant point I collapsed the persistent and joiner categories into a single "on pathway" category. At each determinant point, I make a binary cross-sectional comparison between those on and those leaving their respective pathways. Although only "on pathway" and "leaving pathway" are included in my analyses, the full breakdown of persisters, joiners, leavers, and those outside the scope of inquiry is provided in descriptive statistics (tables 4.1 and 4.2).

## Survey Weights

HSLS used a stratified, two-stage random sample design. The primary sampling units (PSUs) were a probabilistic selection from a known population of approximately 940 public and private schools. The second stage was students randomly sampled from selected and participating schools. The logic of this design is that the first sample of schools is drawn from a known population thus limiting the second random sample of students from a new known, nationally representative population. Heeringa, West, and Berglund (2017) suggest that such stratified designs increase both the "statistical and administrative efficiency of the sample" by drawing from "naturally occurring clusters of elements" (p. 23). To account for expected over- and under-representation from population demographics and response patterns, differential multiplier "weights" are

assigned to each individual in the sample making each respondent a weighted representative for a number of students in the total population. With weights applied, the sample is nationally representative and generalizable out to the entire population of American high school students in the 2009 ninth grade cohort (graduating class of 2013), estimated at approximately 4.1 million individuals.

When working with disparate HSLS sampling waves, it is generally advisable to use a single weight across an entire project in order to keep discussion bounded to the same selection of individuals (E. Christopher, personal communication, 4/30/19). The independent variables at each determinant point beyond the first draw from multiple data collection waves and thus best practices would call for factoring each of these weights into the analyses. However, because these analyses rely on such a small subset of the sample, applying an omnibus weight across all analyses would result in some individuals' weights being zeroed out due to non-response at a particular wave of data collection. Any decrease in the already limited sub-sample would result in decreased statistical power for the present analyses. To maximize inclusion in the available sample for each analysis, I chose to vary sample weights at each analytic point to account for only the sampling wave from which the dependent variable in question was derived. Therefore, for all determinant point one analyses I used only base-year sampling weights, whereas for determinant point two analyses I only applied sampling weights associated with the first follow-up data collection wave. The resultant decreased precision of standard errors is an acceptable cost for the increased statistical power gained from larger cell sizes.

Although HSLS documentation recommends using balanced repeated replication (BRR) for variance estimation (Ingels & Dalton, 2013), the seemingly unrelated

regression estimation I employ (as described below) does not support BRR. I therefore use the Stata-default Taylor-series linearized variance estimator. This compromise results in a slight, but acceptable, decrease in the precision of standard error estimates (Heeringa, West, & Berglund, 2013).

## Independent Variables

Below I discuss the independent variables I use to address each of the three research questions and each of the three forms of justice discussed in chapter one. For a complete list of independent variables and the source data from which the variables were derived, refer to table 3.1.

### Environmental predictor variables.

Research question 1: How do high school characteristics vary between students on and leaving the music education, music, and education pathways at each determinant point?

To answer research question one, I use the following high school environmental characteristics as potential predictors of persistence or attrition from a pathway. These key high school characteristics approximate the societally-created factors determining environmental equity along the pathways. At determinant points one and two, during the high school years, school characteristics reflect data from the academic year of each data collection wave, 2009-10 and 2011-12 respectively. For determinant points three and beyond, I use high school characteristics from the student's final high school attended. For the modal student, this was their fourth year of high school, 2012-13. School characteristics are comprised of two categories: school population and geographic situation.

***School population.***

The school population variables include the percentage of students at the school who were eligible for the National School Lunch Program, the percentage of the student body who were classified as English language learners (ELL) or limited English proficient (LEP), and the percentage of the school's population who identified as non-White racial or ethnic minorities. As Condron & Roscigno (2013) suggested, school population variables may be predictive of intra-district school funding disparities with fewer resources flowing to schools with higher percentages of racial/ethnic minorities and lower wealth profiles. Lower resource investment in certain types of schools could spell disaster for resource-intensive music programs and those students whose future ambitions rely on these programs.

*National School Lunch Program.*

As used in prior research (Fitzpatrick, 2006; Abril & Gault, 2008; Kinney, 2008), student eligibility for the national free and reduced price lunch program serves as a reasonable, albeit contested, proxy for school poverty. The National School Lunch Program, administered by the U.S. Department of Agriculture, provides free or reduced price meals to students based on annually-updated family income eligibility guidelines (USDA, 2018). Some have pointed out that using this proxy variable may overly-simplify wealth and class disparities by isolating only the lowest income group (e.g., Elpus & Abril, 2011) or muddle SES distinctions entirely by focusing on an income only determination as a stand-in for the variety of factors that play into socioeconomic status (e.g., Harwell & LeBeau, 2010). Additionally, because eligibility guidelines do not account for local cost of living, the universal income benchmarks established by the

National School Lunch Program may skew depictions of localized poverty. However, used in conjunction with the other class and poverty variables in these analyses, free and reduced price lunch participation is a reasonably valid construct for the percentage of the school experiencing poverty. I collected data for the percentage of the school eligible for free or reduced price lunch from each school's entry in the Common Core of Data (CCD).

*ELL percentage.*

I drew high school ELL percentage data from the school administrator surveys from the HSLS base-year and first follow-up data collection waves. These data only reflect the percentage of English language learners or limited English proficient students enrolled in the school during the cohort's ninth grade and eleventh grade years when the administrator surveys were completed. In order to collect twelfth grade ELL data to use in later determinant points, I next turned to CCD. Unfortunately, CCD school level entries omit ELL/LEP data despite the fact that NCES has, at least in the past, collected these data as part of the EDFacts initiative, an NCES data collection project wholly separate from CCD. Thanks to a contact within NCES, I was able to locate an EDFacts data file that included 2012-2013 school level LEP counts. Because the EDFacts data suppressed school LEP student counts that were less than five (zero inclusive), I converted all suppressed values to a probable average value of two. I merged these data into my analytic data set using unique NCES School IDs found in both HSLS and the EDFacts data file. I computed the percentage of ELL students at the school by dividing the LEP student count by the total student enrollment.

*Minority percentage.*

I used the Common Core of Data to collect racial/ethnic data for each school represented in my analytic dataset for the three academic years in question. For the purposes of these analyses, I determine racial/ethnic "minority" as anyone who does *not* identify as White non-Hispanic. I calculated the percentage of each school that was racial/ethnic minority for the year by subtracting the White non-Hispanic student count from the student total and then dividing this number by the total student count.

***Geographic situation.***

Geographic situation variables are the school's urbanicity and the distance between students' last high school attended and their most current postsecondary institution of record.

*School urbanicity.*

School urbanicity has received quite a bit of attention in music educational scholarly work. Fitzpatrick's (2015) volume on the subject explored many of the intrinsic or implicit challenges music educators and music students face in these often under- or mis-resourced settings (Henig et al., 2001). Additionally, Reininger's (2012) and Kelly's (2003) work investigating geographic and demographic teacher sorting underscores the need to investigate where pre-service teachers are and are not coming from. School urbanicity, referred to within HSLS as "locale," is coded as one of four categorical conditions: city, suburb, town, or rural. NCES's locale code system is derived from population and proximity to an urbanized area (Ingels et al., 2014, C-12). Because urbanicity in and of itself fails to capture the complexity of these challenges, I include a

number of factors, as discussed in this chapter, that are often implicitly linked with discussions of urban education.

*Distance to college.*

As Reininger (2012) suggested, the distance between secondary schools and the jobs teachers take may play significant roles in teacher sorting and factor into the challenges associated with staffing certain types of schools. Similarly, understanding the mobility patterns evinced by prospective musicians, educators, and music educators when choosing postsecondary institutions may reflect on potential localism in these fields. School-college proximity is determined here as the distance, in miles, between the student's last attended high school and their current postsecondary institution at the determinant point. I calculated these data points using the GPS coordinates provided for each high school in CCD and for each college in IPEDS.

**Profile predictor variables.**

Research question 2: How do student demographics vary between students on and leaving the music education, music, and education pathways at each determinant point?

In answering research question two, I address the profile equity of pathway determinant points. In profile equity, outcomes should be unbiased in regards to factors that are outside the individual's control and result solely from the conditions of birth. The demographic variables I chose to include in this analysis to represent profile equity are race and ethnicity, sex, socioeconomic status, and parental education.

***Race & ethnicity.***

Many have pointed to the roles race and ethnicity play in influencing music educational involvement (Koza, 2008; Draves, 2016; Thornton, 2016 & 2018; Elpus, 2015a; Elpus & Abril, 2011 & 2019). Broadly put, music education has a racial and ethnic "homogeneity problem" (Thornton, 2016) with people of color underrepresented among secondary music students (Elpus & Abril, 2011, 2019), pre-service music teacher candidates (Elpus, 2015a), music teachers (Gardner, 2010), and music teacher educators (Hewitt & Thompson, 2006, 2016).

HSLS includes eight racial and ethnic categories: American Indian/Alaskan Native, Asian, Black/African-American, Hispanic (no race specified), Hispanic (race specified), Native Hawaiian/Pacific Islander, White, and more than one race. In these analyses, I use all eight racial and ethnic categories for descriptive statistics. However, due to small racial and ethnic minority cell sizes among the populations of interest, in predictive statistics I use a dichotomous White/non-White independent variable. While I would much prefer to employ a full range of racial and ethnic categories in these analyses, the confluence of statistical issues from a small sample of aspirant music educators and the general racial/ethnic homogeneity of this population preclude a more nuanced approach. I find support for using simple whiteness as a predictive measure from Thornton (2017) who described racial influence in music education—and society at large—as boiling down to a dichotomous distinction between passing or not passing in a society predominated by White normative cultural and value structures.

***Sex & gender.***

Though birth-assigned sex has been a commonly investigated and discussed variable in music educational population research (Stewart, 1991; Elpus & Abril, 2011; 2019; Elpus, 2015ab; Gardner, 2010), pluralistic conceptions of gender have only recently entered scholarly dialog in the field. Further, the secondary analyst's ability to include anything beyond dichotomous biological sex categories has remained dependent on these categories' inclusion in study design. Not until the most recent HSLS data collection wave did sexual orientation and gender identity (SOGI) data become available. Although I examined SOGI data in my exploratory analyses, the scarce number of individuals within my populations of interest who reported non-binary gender identity limit my ability to make any meaningful statistical comparisons with anything but biological sex categories. Therefore, I include only the independent variable self-reported binary sex in these analyses.

***Socioeconomic status.***

Bates (2012) and others (Elpus & Abril, 2011; 2019) have pointed to the powerful effects class status can have on music education participation. Economic resource availability can function as a barrier to inclusion in music education by limiting access to quality instruments, private instruction, travel opportunities, and after-school commitments.

HSLS includes socioeconomic status in two composite variables derived from parents' education, parents' occupation, and family income. The first version of the SES variable is comparable to earlier NCES longitudinal data collections; the second version, newly revised for the most recent HSLS data release, also factors urbanicity in to adjust

for the effects of geographic variation in the "cost of living." I opted to use the HSLS SES variables that also factor urbanicity into the equation in order to capture the localized effects these variables may have.

***Parent education.***

As has been suggested by prior research (Fitzpatrick, Henninger, & Taylor, 2014; Thornton, 2018), the institutional knowledge college graduate parents provide their children could play an influential role in admission, persistence, or attrition outcomes. To investigate the potential pathway impact of not having a parent with a college degree, I used the parents' highest degree reported to isolate individuals who did not have at least one parent with a postsecondary degree.

Because the SES and parent education variables draw from the same source data, these variables present the possibility of violating a logistic regression assumption by introducing multicollinearity into the model. In addition to the violated regression assumption, increased multicollinearity in the model increases the chances of making a Type II error. For each model that includes these variables, I checked the collinearity of these predictors using a variance-covariance estimators (VCE) matrix postestimation command in Stata (`estat vce, corr`). I used .80 as the correlation threshold for indicating collinearity.

**Navigational predictor variables.**

Research question 3: How do student actions, choices, and expressed values regarding high school, college, and careers vary between students on and leaving the music education, music, and education pathways at each determinant point?

I use the following independent variables to answer research questions three, regarding the student's individual contribution to persistence or attrition. As discussed above, the individual contribution construct considers the student's actions, choices, values, and intentions that contribute to their own outcomes. By looking backward at prior effort and achievement and forward at expressed intentions and value statements, I examine the roles the individual's choices, actions, and intentions play in their own persistence along or attrition from a pathway.

***High school classes.***

Students' choices to enroll and degree of enrollment in high school music courses serves as an indicator of student effort through time investment in music education. Data for music enrollment by each student throughout their high school career were compiled from HSLS transcript data by Elpus & Abril (2019). I used annual dichotomous music (non-)enrollment flags to construct an accrued enrollment variable reflecting the number of years, to date, that each student was enrolled in at least one music class at their school. For example, if a student took music classes in their ninth grade and eleventh grade years only, their total years in high school music would be two, whereas a student who was enrolled in at least one music class each year of high school would have a total of four. The music enrollment variable ranges in whole numbers from zero (never enrolled in high school music) to four (enrolled in high school music all four years). These data were only available for students with high school transcript data in HSLS.

High school GPA, measured on a standard 4.0 scale, relays students' scholastic efforts at large. It should be noted that GPA possibly represents a socially mediated measure of academic achievement due to the occasional subjective nature of grade

assignment and the advantage afforded to students whose soft skills can earn them higher marks (Noble & Sawyer, 2004).

***Aspirations.***

Degree aspirations and professional aspirations serve as direct indicators of student intention to persist along a pathway. Because prior intentions along a career or degree track are used to derive the dependent variables at four of the six determinant points, I cannot use career-career or degree-degree pairings as predictive variables. However, because the career and degree tracks are derived independently, I am able to use most recently expressed career intentions as predictors at degree determinant points (three, four, and six). Likewise, I employ degree enrollment as a career predictor at determinant point five.

In addition to field aspirations, I include, when available, the amount of thought students have invested in these decisions (determinant points one and two) and their certainty of intended outcomes (determinant points two and five). How much respondents thought about their chosen career intentions was collected as one of four options: (1) not at all, (2) a little, (3) somewhat, or (4) a lot. Respondents' certainty of the occupational intentions was collected as one of three options: very certain, fairly certain, not certain.

***Reasons & preferences.***

I use students' statements about reasons for choosing or changing their major and their preferences for certain job characteristics to round out the student value profile.

During the second follow-up HSLS data collection wave, respondents were asked a number of questions about their choice of major and job intentions. When asked their main reason for choosing their primary major, respondents were offered one of seven

options to answer this question: (1) enjoys courses in major, (2) does well in courses, (3) graduates of major have high earning potential, (4) graduates of major have jobs with a good work/life balance, (5) availability of jobs for graduates of this major, (6) jobs in this field tend to contribute to society, or (7) because someone else encouraged this major. Since this question only applied to the primary major, when using this variable, I exclude individuals whose secondary major flagged them for inclusion in these analyses.

Students who indicated that they changed their major from what it was at the start of college were asked to select one of 12 options as the main reason for the change[2]. Because this variable only applies to those who left one major for another, I include this variable in the descriptive statistics for individuals who indicated one of the degrees of interest early in their college careers but did not end up in the respective degree.

In respect to their views on occupations, respondents were asked to compare the importance of six job aspects in relation to salary. Among these job characteristics, I am primarily interested in the comparison between how the populations of interest compare salary and the societal contribution of their anticipated job. Additionally, using the same salary comparison questions, I created an index of the remaining five job characteristics in order to measure the relative weight respondents' will give to salary when making their occupational determinations.

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[2] The possible reasons for changing majors were: (1) major was not available, (2) did not enjoy courses, (3) was not doing well in courses, (4) low earning potential for graduates, (5) hard work/life balance for graduates, (6) jobs don't contribute to society, (7) not enough jobs available, (8) someone discouraged degree pursuit, (9) did not fit in with people in courses, (10) course schedule interfered with other responsibilities, (11) became more interested in another degree, and (12) liked job opportunities in another degree.

Table 3.1

*Independent Variables, Data sources, and Determinant Points (DP) Where Used*

| Variable | HSLS source | Description | DP |
|---|---|---|---|
| Urbanicity | X1LOCALE, X2LOCALE, X3LOCALE, X4LOCALE | High school locale (city, suburb, town, rural) | ALL |
| Lunch | Free Lunch Eligible*, Reduced-price Lunch Eligible Students*, Total Students* | Percentage of high school eligible for free/reduced price meals | ALL |
| ELL | A1ELL, A2ELL, § | Percentage of high school that is English language learners or limited English proficient | ALL |
| Minority | White Students*, Total Students* | Percentage of high school that does *not* identify as White non-Hispanic | ALL |
| Distance | Longitude*, Latitude*, Longitude†, Latitude† | Miles between graduating high school and most recent college | 4, 5 |
| Whiteness | X1RACE, X2RACE | Self-identified White non-Hispanic | ALL |
| Sex | X1SEX, X2SEX | Birth-assigned sex (male, female) | ALL |
| SES | X1SES_U, X4X2SES_U | Socioeconomic status | ALL |
| FirstGen | P1HIDEG1, P1HIDEG2, P2HIDEG1, P2HIDEG2 | Neither parent holds a postsecondary degree | ALL |
| MusicEnrollment | ‡ | Number of high school years enrolled in music classes | ALL |
| GPA | X3TGPA9TH, X3TGPA10TH, X3TGPA11TH, X3TGPA12TH, X3TGPATOT | Cumulative high school grade point average | ALL |
| JobThought | S1OCC30THINK, S2OCC30THINK | The amount of thought individual has given to response to aspirant occupation question | 1, 2 |
| JobCertainty | S2OCC30CERTAIN, S4OCC30CERTAIN | How certain individual is that they will achieve aspirant occupation | 2, 6 |
| Aspiration | S1OCC30, S2OCC30, S4OCC30, S3FIELD6, S4FIELD6, X4RFDGMJ16, X4RFDGMJ26 | Individual's most recent occupational/educational aspiration | 3, 4, 5, 6 |
| MainReason | S4MAJMAINRSN | The main reason for choosing postsecondary degree program | 4, 5 |
| Contribution | S4JOBCONTRIB | Individual favors contribution to society over salary when choosing a job | 6 |
| SalaryIndex | S4JOBBALANCE, S4JOBDECISION, S4JOBSECURE, S4JOBLOCATION, S4JOBTEAMWRK | Relative importance of salary when choosing a job | 6 |

*Note.* * CCD, † IPEDS, ‡ Elpus & Abril (2019), § EDFacts. HSLS Variables begin with a 2-character code indicating the precise source of the information. The first character indicates the informant (S = Student, P = Parent, A = School Administrator, X = composite calculated or imputed by NCES from one or more sources). The second character indicates the data collection wave (1 = Base-year, 2 = First follow-up, 3 = 2013 Update, 4 = Second follow-up).

## Data Cleaning

Drawing in the variables outlined above, I used a combination of Stata 15.1, Microsoft Excel 2013, and Google Sheets to transform, recode, and clean the analytic dataset. In preparing the dataset for analyses, first, I converted all variable names from the HSLS default full capitalization to lower case for convenience and personal coding preference. Next, I converted missing values, coded in HSLS syntax as negative numbers, to a Stata-usable format.

Using student music enrollment information compiled by Elpus and Abril's (2019) work with the HSLS student transcript data, I merged music enrollment flags and music credit counts into my working analytic dataset.

As has been done in prior research (Reininger, 2012), I employed additional NCES datasets to supplement the information available in HSLS. I merged high school data for each respondent by pairing their school's NCES ID with school data from the Elementary and Secondary Information System (ElSi) Common Core of Data (CCD)—a database of primary and secondary school information also maintained by NCES. These analyses require annual school data from three different years across the analytic time-frame. From work on an unrelated project as a part of the University of Maryland Music & Arts Education Data Lab (MADLab), I assembled a dataset including eleven years (2005-2015) of CCD data. Using the MADLab CCD file, I paired each student with their reported high school's data for the 2009-10, 2011-12, and 2012-13 academic years. For college geographic data, I relied on another NCES data source, the Integrated Postsecondary Education Data System (IPEDS). I paired students with their respective postsecondary institutions using unique postsecondary identification numbers found in both HSLS and IPEDS.

## Analyses

The first and third determinant points serve as first measurement points of the career and degree pathways. At these points, I use logistic regression to model selection into the musician, educator, or music educator pathway against the rest of the population. At the first point, I compare selection into the three career pathways against the rest of the HSLS cohort. At the third determinant point, I compare selection into the three degree pathways against the rest of the college-bound cohort. Establishing these two points as baseline measurements at the outset of these tracks allows me to situate the subsequent outcomes within the context of the full cohort.

For the second, fourth, fifth, and sixth determinant points, outcomes were based on an individual's inclusion within a group (i.e., pathway persisters and joiners) or exit from that group (i.e., pathway leavers). For these dichotomous outcomes, I used logistic regression to model the significance and predictive strength of each set of variables.

As discussed above, I grouped predictor variables of interest into three categories: environmental, profile, and navigational. Environmental predictors are represented by high school characteristics. Profile variables include student and family demographics. Navigational variables include student choices and expressed intentions regarding school, degree programs, and prospective careers.

At each determinant point, in accordance with my three research questions, I used the three groups of independent variables to model how each outcome achieved or failed to achieve each conception of equity at that specific point in the pathway. Research question one, concerning the variance of high school characteristics, addresses environmental equity. This construct considers how societal structures around individuals influence their outcomes. In order to achieve environmental equity, high school characteristics cannot

play a significant role in determining outcomes. Statistical significance of individual high school characteristics or the model overall would suggest that environmental factors influence whether individuals are on or leaving the pathway.

The second research question, concerning demographic variance between the populations, addresses the concept of profile equity. Profile equity calls into account an individual's demographic profile. To achieve profile equity at a determinant point, demographic variables cannot be significant outcome predictors.

For the third research question, I consider the individual's contribution to their own persistence or attrition by how they navigate their pathway. Navigational equity examines the fairness of the pathway measured at the student contribution level. Unlike either environmental or profile equity, the individual's choices and actions are central to this construct. Achieving navigational equity is demonstrated by significant positive influences on outcomes by variables associated with student intentions and efforts to persist along the pathway.

Using Stata 15.1, I employed logistic regression to determine the significance and effect size of each model and each independent variable within the model. For each model, Stata returns an *F*-statistic and measure of significance. I set an alpha of .05 as the threshold for statistical significance.

As shown below, the independent variables in the environmental equity model (model 1) and profile equity model (model 2) remain, for the most part, constant through all six determinant points. The navigational model (3) changes over the course of the six determinant points to incorporate independent variables as they become available. See below for the formulas used at each determinant point.

**Analytic models by determinant point.**

## Model 1: Environmental Variables

$$\ln\left[\frac{P(On\ Pathway)}{P(Off\ Pathway)}\right] = \alpha + \beta_1 Urbanicity_j + \beta_2 Lunch_j + \beta_3 ELL_j + \beta_4 Minority_j\ (+\ \beta_5 Distance_i) + \varepsilon$$

## Model 2: Profile Variables

$$\ln\left[\frac{P(On\ Pathway)}{P(Off\ Pathway)}\right] = \alpha + \beta_1 Whiteness_i + \beta_2 Sex_i + \beta_3 SES_i + \beta_4 FirstGen_i + \beta_5 ParentField_i + \varepsilon$$

## Model 3: Navigational Variables

### Determinant Point 1

$$\ln\left[\frac{P(On\ Pathway)}{P(Off\ Pathway)}\right] = \alpha + \beta_1 MusicEnrollment_i + \beta_2 GPA_i + \beta_3 JobThought_i + \varepsilon$$

### Determinant Point 2

$$\ln\left[\frac{P(On\ Pathway)}{P(Off\ Pathway)}\right] = \alpha + \beta_1 MusicEnrollment_i + \beta_2 GPA_i + \beta_3 JobThought_i +$$

$$\beta_4 JobCertainty_I + \varepsilon$$

### Determinant Point 3

$$\ln\left[\frac{P(On\ Pathway)}{P(Off\ Pathway)}\right] = \alpha + \beta_1 MusicEnrollment_i + \beta_2 GPA_i + \beta_3 Aspiration_i + \varepsilon$$

### Determinant Point 4

$$\ln\left[\frac{P(On\ Pathway)}{P(Off\ Pathway)}\right] = \alpha + \beta_1 MusicEnrollment_i + \beta_2 GPA_i + \beta_3 Aspiration_i + \varepsilon$$

### Determinant Point 5

$$\ln\left[\frac{P(On\ Pathway)}{P(Off\ Pathway)}\right] = \alpha + \beta_1 MusicEnrollment_i + \beta_2 GPA_i + \beta_3 Aspiration_i + \beta_4 MainReason_i + \varepsilon$$

### Determinant Point 6

$$\ln\left[\frac{P(On\ Pathway)}{P(Off\ Pathway)}\right] = \alpha + \beta_1 MusicEnrollment_i + \beta_2 GPA_i + \beta_3 Aspiration_i + \beta_4 JobCertainty_i +$$

$$\beta_5 Contribution_i + \beta_6 SalaryIndex_i + \varepsilon$$

**Seemingly unrelated regression.**

A key facet of this analysis hinges on my ability to compare the magnitude, sign, and statistical significance of estimated coefficients associated with persistence and attrition variables across the music education, music, and education pathway models. Comparing the significance and coefficient of each variable within the music educator pathway to its relative predictive power in the other two parallel paths allows me to pinpoint areas of commonality and particularity along the music educator pathway. Pairing each music educator model (MUED) with its corresponding musician (MUSC) or educator (EDUC) model presents an analytic challenge because of the disjunct nature of the three populations. As discussed above, at each determinant point except for determinant points one and three, I model a dichotomous outcome between those either on or leaving one of the three paths. As each path is a distinct dependent variable requiring its own model to be estimated, I need to make inter-model comparisons of the coefficients estimated at each determinant point among the MUED model, the MUSC model, and the EDUC model. To accomplish this end, I turn to seemingly unrelated regression estimation (SURE).

SURE (Zellner, 1962) is a method for making simultaneous regression estimations on models with distinct dependent variables. This approach provides a method of comparing coefficients from disparate but characteristically similar models, thus seemingly unrelated. Seemingly unrelated estimations hold an edge over other forms of simultaneous estimation in the method's treatment of cross-equation correlation. This analytic advantage is critical to the present study. As both Zellner (1963) and Washington, Karlaftis, and Mannering (2011) explained, the seemingly unrelated

equation approach is particularly suitable in situations where error terms are likely to be highly correlated. Because the unobserved characteristics relating to persistence or attrition from any pairing of MUED-MUSC, or MUED-EDUC pathway models are likely to be highly correlated, SURE is an ideal method for making inter-model comparisons. Importantly, and in contrast to other forms of simultaneous estimation, seemingly unrelated estimations do not require direct interaction between equations (Washington, Karlaftis, & Mannering, 2011). In other words, seemingly unrelated estimations do not require that success (i.e., being "on pathway") in one pathway model be indicative of failure (i.e., being "off pathway") in the model for another pathway. This point is important in these analyses because of the potentially overlapping assignment of individuals between pathways. For example, if an individual indicated that at age 30 they intend to "either teach physics or be a band director," then this individual would be considered "on pathway" in *both* the educator model and the music educator model.

I use the seemingly unrelated postestimation command in Stata (`suest`) to estimate a simultaneous covariance matrix between each pair of models (MUED-EDUC & MUED-MUSC). From the estimated results of each pair of models, I use a linear combination (`lincom`) postestimation to perform an adjusted Wald test of difference between independent variable coefficients. The linear combination command in Stata returns the difference in the variable's coefficients between the two models, the standard error of the estimation, a *t*-statistic with a test of significance, and a 95% confidence interval for the difference between the coefficients. I assign an alpha of .05 for achieving statistical significance on the adjusted Wald test. A significant result on an adjusted Wald test would indicate that the two coefficients being compared across models are

significantly different from each other—in other words, that one effect is significantly larger than the other.

Being able to compare coefficients in this way allows me to draw conclusions about the relative strength of a predictor's statistical association with being "on pathway" across the different outcome models. For example, using seemingly unrelated regression and the linear combination postestimation, I could draw a reasonable conclusion about whether a certain high school characteristic (say, the percentage of ELL students in the high school) was more or less predictive of an individual being "on pathway" as a musician than it was predictive of an individual being "on pathway" as a music educator.

## Chapter Conclusion

Using the methods outlined above to address my three research questions, these analyses may shed light on key demographic, environmental, or self-determined bottlenecks along the longitudinal progression from aspirant high school student to credentialed professional. Ascribing the nature of equitable or inequitable outcomes using three conceptions of justice may help to characterize potential bottlenecks from multiple perspectives and multiple understandings of equity. By juxtaposing the significant predictors and outcomes among the three parallel music, education, and music education pathways, I hope to construct a multi-dimensional perspective of the music education pathway as situated between these parallel fields. Understanding the common and unique challenges prospective music educators face along the pathway may help move the field toward achieving more inclusive diversity through equitable outcomes.

# Chapter 4: Results

In this chapter, I present findings from each set of analyses. The chapter is structured as three longitudinal examinations of the pathways, each focusing on a distinct perspective. In the first perspective, in accordance with research question one, I follow the music, education, and music education pathways from ninth grade to the third year after high school focusing on how high school environmental factors contributed to persistence or attrition along each respective pathway. Next, I follow the same three trajectories, but this time considering the roles students' demographic profiles played in uptake, persistence, and attrition. Finally, I trace the three parallel pathways, once more, to examine them from the perspective of how individual choices, actions, and values worked in the navigation of each pathway.

Each section begins with descriptive statistics including bivariate analyses of how pathway members vary in comparison to the rest of the HSLS cohort along the independent variables included in the model at hand. For continuous variables, I used an Adjusted Wald test of significance to compare significant difference at an alpha of .05. For categorical variables, I used a weighted Pearson chi-squared statistic with a Rao-Scott correction (1984) to handle sampling weights, again employing an alpha of .05 for significant difference.

I then present the logistic regression model results in table format followed by a brief discussion of the results. As discussed in the previous chapter, logistic regressions at the first and third determinant points model selection into the aspirant professional or aspirant degree-seeker pathways, respectively, against the rest of the HSLS cohort. At the other four determinant points, logistic models measure the predictive significance and

strength of the independent variables in determining either on-pathway or pathway leaving status. For statistically significant models, I present an *F*-statistic and relative *p* value. At each determinant point, I highlight key significant findings and some interesting non-significant results.

All standard errors in both bivariate comparisons and the logistic models are robust to the complex sampling design of HSLS. In accordance with restricted-use data confidentiality agreements, all exact counts, including those included in *F* statistic results have been rounded to the nearest ten. I have rounded all weighted population estimates to the nearest hundred.

Due to low observed music educator population counts across the scope of inquiry, the music education models rely, in part, on an out-of-scope subset of the of the sample for structural stability. For this reason, I omit analytic sample counts for all six MUED models. While all reported odds ratios are robust to this adjustment, music education model *F* statistics, *p* values, and standard errors should be interpreted with caution.

At points where two pathways share a significant predictor, I include the results from a SURE postestimation comparing the predictor between the two pathways. In SURE comparison postestimations, *t* statistics express the difference in effect size between the variable of interest in the music educator model and the parallel juxtapositional model. Positive *t* values indicate that the predictive variable is stronger in the music educator model while negative *t* values point to more strength in the parallel model.

I conclude the chapter with a brief synopsis of these results, underscoring how each perspective of equity functions in each pathway across the six determinant points.

## Population Counts

Weighted population estimations and actual observation counts from the HSLS dataset of individuals who were "on pathway" at each of the six determinant points can be seen in table 4.1. Although I discuss the three aspirant populations as stable entities unto themselves, a relatively high amount of churn between pathway leavers—as can be seen in table 4.2 and will be discussed below—and pathway joiners means that the aspirant group at each successive determinant point often represents a somewhat different group of individuals.

Table 4.1
*On Pathway Population Estimates by Determinant Point, Pathway, and Pathway Intersection*

| **Determinant Point** | **MUSC** | ∩ | **MUED** | ∩ | **EDUC** |
|---|---|---|---|---|---|
| DP1 | 59,000 (350) | 1,900 | 9,900 (50) | 900 | 157,600 (780) |
| DP2 | 61,600 (300) | 1,300 | 9,500 (60) | 200 | 159,700 (810) |
| DP3 | 29,200 (150) | - | 10,000 (50) | - | 150,000 (700) |
| DP4 | 27,000 (120) | - | 12,400 (60) | - | 153,800 (700) |
| DP5 | 29,800 (120) | 900 | 10,100 (40) | 1,000 | 148,700 (640) |
| DP6 | 22,900 (120) | 1,000 | 9,700 (40) | 200 | 144,100 (660) |

*Note.* All weighted population estimates are rounded to the hundreds place. All actual counts (in parentheses) are rounded to the tens place. All intersectional actual counts were ten or fewer and are therefore omitted.

Table 4.2
*Leaving Pathway Population Estimates and Attrition by Determinant Point and Pathway*

| | MUSC | | MUED | | EDUC | |
|---|---|---|---|---|---|---|
| **Determinant Point** | **Leavers** | **Attrition** | **Leavers** | **Attrition** | **Leavers** | **Attrition** |
| DP2 | 34,300 (180) | .58 | 3,900 (20) | .39 | 78,800 (350) | .50 |
| DP4 | 9,600 (40) | .33 | 900 (< 10) | .09 | 35,100 (160) | .23 |
| DP5 | 4,700 (30) | .18 | 3,700 (20) | .30 | 33,900 (180) | .22 |
| DP6 | 54,400 (190) | .88 | 6,600 (40) | .70 | 106,200 (450) | .67 |

Note. All weighted population estimates are rounded to the hundreds place. All actual counts (in parentheses) are rounded to the tens place. Estimated attrition was calculated by dividing the weighted count of individuals leaving the pathway by the weighted count of on pathway individuals in the previous corresponding occupational or degree determinant point. Because determinant point six is derived from occupational intentions, attrition at this point was calculated from the "on occupational pathway" population at determinant point two.

Weighted population estimates suggest that, overall, the total number of people on the music education pathway stayed relatively stable between high school and college at around 10,000 aspirant music educators. There were an estimated 9,900 ninth graders in 2009 who said they intended to be teaching music at age 30. This number fell slightly in eleventh grade to 9,500 individuals. Just after high school, approximately 10,000 people planned to pursue a music education degree in college while 12,400 people were strongly considering a music education degree at the beginning of college. Three years into college, there were 10,100 people with music education as either their first or second degree. Slightly fewer (9,700) at this postsecondary data collection point intended to be teaching music in approximately ten years at the age of 30.

The overall population stability of the aspirant music educator pool contrasts with the marked declines seen among the larger aspirant musician and aspirant educator populations. While around 60,000 people in the first two high school data collection waves planned to work in a music profession at age 30, this number cut in half for people pursuing non-education music degrees and fell to just over a third of the original total when respondents were asked about age 30 occupational intentions three years after high school. Contrast between the music pathway population decline and the other two pathways can be seen in figures 4.3a-c As can be seen in table 4.1, aspirant educator populations show a less pronounced, but still apparent decline over the course of high school and postsecondary aspirations.

In all, aspirant music educators accounted for about three in every thousand high school students while music education majors made up approximately four per mill of third year college students.

As shown in table 4.1, there were a relative handful of individuals who were concurrently considering a music pathway or an education pathway along with the music education pathway with the former intersection of music and music education slightly more common than the latter music education and education pairing.

The number of people who expressed intentions to teach music or pursue a music education degree and then changed their occupational or degree intentions in the next corresponding data collection wave—here described as pathway leavers—can be seen in table 4.2. In the second data collection wave, during the third year of high school, approximately 3,900 individuals who said in ninth grade that they planned to teach music at age 30 expressed a different occupational intention when asked again. This number

equates to 39% attrition from the ninth grade aspirant music educator population. Between end of high school degree intentions and what third year college students described as their most seriously considered field at the beginning of college, the aspirant music educator population drops by about 900 individuals or 9%. From the beginning of college, as retrospectively described in determinant point four, and three years later, roughly 3,700 individuals who were pursuing a music education degree at the beginning of college changed to a different major. This amounts to three in ten music education majors leaving the degree program in the first three years of college. This number is in line with the approximate third of the overall degree-seeking cohort who changed their major at least once. When asked about age 30 occupational intentions three years after high school, 70% of the people who indicated intentions to teach music during the eleventh grade data collection (determinant point two) no longer planned to teach music at age 30.

As discussed above, and can be seen in the relative population stability across the aspirant music educator determinant points in table 4.1 despite high rates of pathway leavers shown in table 4.2, attrition at each determinant point is supplemented by pathway joiners.

Attrition patterns among aspirant musicians and aspirant educators, as shown in table 4.2, were fairly similar to those among aspirant music educators. Music education major populations may experience slightly higher attrition than the other two fields, however this population loss is likely mitigated by slightly higher mid-college uptake among music education degree programs.

## Environmental Equity

My first research question, 'how do high school characteristics vary between students on and leaving the music education, music, and education pathways at each determinant point?,' addresses the potential influence of environmental variables on pathway uptake, persistence, and attrition.

Below, I present my findings from examining how five high school characteristics predict selection into, persistence along, or attrition from each of the three pathways across the scope of the seven year analytic time frame. The variables under examination are 1) high school urbanicity, 2) the percentage of the school that is eligible for the National School Lunch Program (NSLP), 3) the percentage of the school that is English Language Learners (ELL) or Limited English Proficient (LEP), 4) the percentage of the school population that is non-White racial/ethnic minority students, and 5) the distance between students' high schools and postsecondary institutions.

The results below indicate how each of the three pathways and determinant points measures in terms of environmental equity as determined by variance and influence of high school characteristics.

### Environmental descriptive statistics.

Below, I discuss sample frequency along the three pathways of interest in regards to environmental predictors. I use bivariate statistics to describe how high school characteristics among on-pathway individuals compare to the rest of the HSLS cohort at each determinant point. For occupational determinant points (one, two, and six), all bivariate comparisons are in relationship to the full HSLS cohort. For determinant points three through five, the aspirant degree track, all comparisons are in relationship to only the college-bound or college attending subset of the HSLS cohort.

Table 4.3

*School Population Environmental Frequency Statistics by Pathway and Determinant Point*

| Variable by DP | Pathway | | | |
|---|---|---|---|---|
| **Percent NSLP** | **MUSC** | **MUED** | **EDUC** | **HSLS Total** |
| 1 | 31.32***<br>$F(1, 410) = 21.46$ | 32.75*<br>$F(1, 410) = 4.48$ | 34.55**<br>$F(1, 410) = 7.72$ | 39.29 |
| 2 | 42.61 | 34.23**<br>$F(1, 490) = 7.62$ | 39.74 | 42.91 |
| 3 | 27.21**<br>$F(1, 490) = 10.24$ | 29.70 | 32.26 | 33.46 |
| 4 | 28.95 | 29.18 | 32.58 | 33.77 |
| 5 | 29.01 | 28.92 | 32.18 | 33.07 |
| 6 | 31.94 | 37.75 | 32.54**<br>F(1, 490) = 10.21 | 37.24 |
| **Percent ELL** | | | | |
| 1 | 4.67**<br>$F(1, 420) = 6.81$ | 3.90*<br>$F(1, 420) = 6.11$ | 4.91*<br>$F(1, 420) = 5.18$ | 6.27 |
| 2 | 5.69 | 4.99 | 5.98 | 6.79 |
| 3 | 4.37 | 2.56***<br>$F(1, 490) = 11.13$ | 3.53*<br>$F(1, 490) = 5.83$ | 4.72 |
| 4 | 5.82 | 2.23***<br>$F(1, 490) = 21.51$ | 4.65 | 4.94 |
| 5 | 6.88 | 1.87***<br>$F(1, 490) = 26.11$ | 4.59 | 4.85 |
| 6 | 3.90 | 5.65 | 4.50 | 5.20 |
| **Percent Minority** | | | | |
| 1 | 36.27*<br>$F(1, 470) = 4.88$ | 29.01**<br>$F(1, 470) = 8.94$ | 32.53***<br>$F(1, 470) = 18.26$ | 41.25 |
| 2 | 46.59 | 36.40 | 35.74**<br>$F(1, 490) = 9.40$ | 43.68 |
| 3 | 37.86 | 29.15**<br>$F(1, 490) = 7.41$ | 31.58***<br>F(1, 490) = 29.09 | 41.91 |
| 4 | 42.93 | 29.24***<br>$F(1, 490) = 16.56$ | 34.65***<br>$F(1, 490) = 15.72$ | 42.76 |
| 5 | 44.75 | 29.14**<br>$F(1, 490) = 8.73$ | 35.39**<br>$F(1, 490) = 8.58$ | 42.24 |
| 6 | 40.48 | 42.91 | 37.64**<br>$F(1, 490) = 8.34$ | 44.35 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. Determinant points three through five include only college-bound or college attending students for point of comparison. Urbanicity distribution is presented as proportion City/Suburb/Town/Rural (C/S/T/R). Stars denote significant difference on Adjusted Wald

test between pathway subpopulation and the rest of the cohort at that determinant point; * $p < .05$, ** $p < .01$, *** $p < .001$.

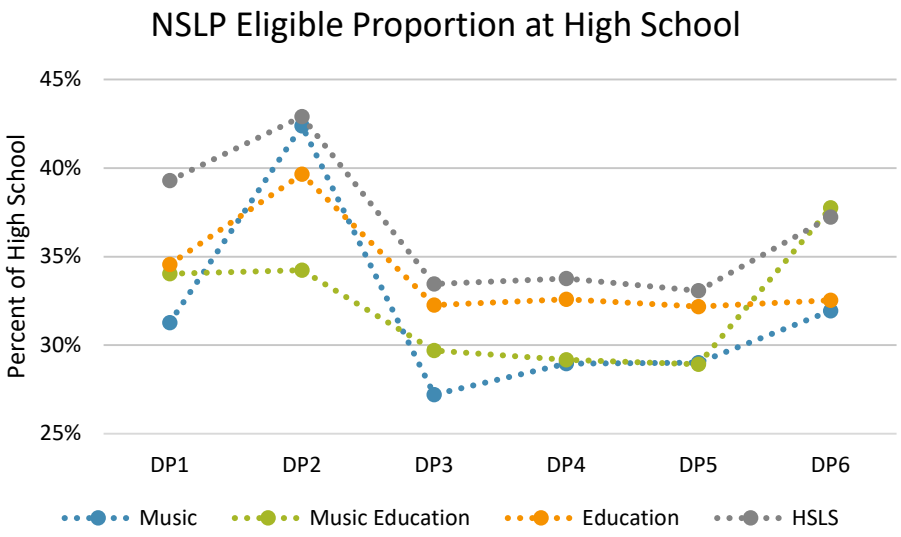
***NSLP.***

Aspirant music educators tended to come from schools with lower than average proportions of students who were eligible for the National School Lunch Program (NSLP) at all six points along the pathway. The difference between aspirant music educator schools and the rest of the cohort was significant at the first and second determinant points. The difference was most apparent in the cohort's third year of high school (as can be seen in figure 4.1) when aspirant music educators' high schools averaged nine percentage points fewer students eligible for the NSLP than the cohort overall. This was the largest pathway to cohort difference among all three pathways. As shown in table 4.3, the schools supplying students to the music educator pathway maintained an average four to five percent deficit of NSLP eligible students in the first, third, fourth, and fifth determinant points.

Along the aspirant musician pathway, high schools with aspirant musicians averaged significantly fewer NSLP-eligible students than the rest of the cohort at the first and third determinant points. High schools with individuals on the educator pathway had significantly lower percentages of students eligible for NSLP at the first and sixth determinant points, with roughly five percent fewer NSLP eligible students at each point.

Past the initial determinant point, the three pathways did not align by determinant point in significant differences from the rest of the cohort. Nonetheless, all three pathways suggest under-representation of students from high schools with higher proportions of NSLP-eligible students.

Figure 4.1




***English language learners.***

The percentage of English language learners (ELL) or limited English proficient (LEP) students at a high school appears to have had subtle but significant relations with the music, education, and music education pathways. At the first determinant point, ninth grade aspirant musicians, educators, and music educators all had significantly fewer ELL students at their schools than the rest of the cohort. Although this difference was significant in each case, the difference only amounted to a one to two percent difference, as shown in table 4.3.

At the third through fifth determinant points, the average percentage of ELL students in the high schools degree-seeking music educators attended was significantly lower than the rest of the cohort. This trend bottomed out at determinant point five where ELL students made up 4.85% of the college bound cohort's high school population, while only accounting for 1.87% of the music education majors' high school population. With the exception of the last determinant point, students on all points of the music education

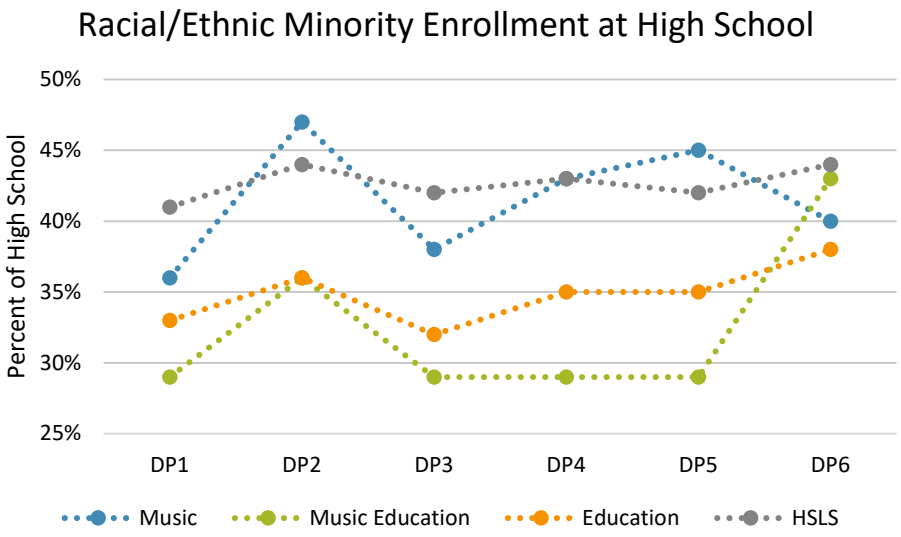
pathway appear to have attended high schools with lower populations of ELL students than the other two pathways and the rest of the cohort at large.

***Percent racial/ethnic minority.***

The percentage of racial ethnic minority students at a student's high school, as can be seen in table 4.3, was significantly associated with all three pathways. Along the music education pathway all but the second and sixth determinant points showed aspirant music educators to come from high schools with significantly lower percentages of racial/ethnic minority students than the national averages. As figure 4.2 shows, aspirant music educators had the lowest average percentages of racial/ethnic minorities at their high schools, hovering just below the 30% mark at the first, third, fourth, and fifth determinant points.

Similarly, aspirant non-music teachers had significantly lower percentages of racial/ethnic minorities at their schools than the rest of the cohort at all six determinant points. The aspirant musician determinant points, on the other hand, suggested a slightly different school profile than the other two pathways. While ninth grade aspirant musicians, as shown in the first determinant point in table 4.3, had significantly fewer racial/ethnic minorities at their schools than the rest of the cohort, the high schools from which aspirant musicians at the rest of the determinant points hailed were not significantly different from the rest of the cohort in terms of racial/ethnic minority proportion.

Figure 4.2




***Urbanicity.***

High schools located in urban areas may tend to have fewer students pursuing the music education pathway than the cohort average while high schools located in towns or rural areas may produce aspirant music educators at higher than average rates. As shown in table 4.4, the percentage of students from urban schools represented in the aspirant music educator pathway was lower than the HSLS average at the first five determinant points. Only three years after high school graduation did individuals from urban high schools express higher than average interest in pursuing the music teaching profession. As can also be seen in this table, the proportion of aspirant educators from either rural or exurban town schools was either at or above average in all six determinant points.

The fifth determinant point was the only time that the music educator pathway reached statistically significant difference from the rest of the HSLS cohort in terms of high school urbanicity. At this point nearly half (47%) of music education majors came from rural high schools. This proportion was twenty percentage points higher than the

national average among degree-seeking students. This surprising outcome, however, could be an artifact of sampling or cohort effect from HSLS design and should be interpreted with caution. Students from urban and suburban high schools, at this point, were roughly half as frequently represented among music education majors as they were within other types of degree programs.

The aspirant educator pathway showed patterns similar to the music educator pathway with individuals from urban and suburban high schools underrepresented among aspirant educators while those from rural high schools tended to be overrepresented along the pathway. Although the high school urbanicity distribution within the education major population was not significantly different from the rest of the cohort at determinant point five, as it was in the music education pathway, aspirant educators appear to be significantly different from the rest of their degree-seeking peers at the two prior college major determinant points.

In contrast to the other two pathways, aspirant musicians appear to have come from suburban high schools at higher rates than the rest of the cohort. While ninth grade was the only point that aspirant musicians were significantly different from the rest of the cohort in terms of high school urbanicity, the aspirant musician population had higher than average proportions of individuals from suburban high schools at all six determinant points.

Table 4.4

*Geographic Situation Environmental Descriptive Statistics by Pathway and Determinant Point*

| **Urbanicity Distribution** (C/S/T/R) | **MUSC** | **MUED** | **EDUC** | **HSLS Total** |
|---|---|---|---|---|
| 1 | .25/.42/.08/.25 * $F(2.93, 1450) = 3.28$ | .15/.37/.19/.29 | .28/.34/.12/.26 | .32/.33/.12/.23 |
| 2 | .32/.34/.12/.23 | .21/.33/.17/.30 | .29/.26/.13/.32 | .31/.27/.12/.30 |
| 3 | .30/.41/.11/.18 | .21/.29/.22/.28 | .23/.26/.14/.38*** $F(2.88, 1410) = 8.01$ | .31/.30/.11/.28 |
| 4 | .38/.38/.09/.14 | .21/.25/.15/.39 | .26/.29/.11/.34* $F(2.74, 1350) = 2.90$ | .31/.30/.11/.28 |
| 5 | .38/.34/.13/.16 | .14/.17/.22/.47** $F(2.23, 1100) = 1.80$ | .25/.30/.11/.33 | .31/.31/.11/.27 |
| 6 | .31/.40/.04/.27 | .41/.17/.18/.25 | .27/.28/.11/.33 | .31/.29/.12/.27 |
| **Median Miles to College** | | | | |
| 4 | 59.57*** $t = 3.81$ | 50.78 | 29.18 | 35.76 |
| 5 | 59.57* $t = 2.14$ | 53.17*** $t = 5.59$ | 26.77 | 32.79 |
| 6 | 47.55 | 38.66 | 27.38 | 27.91 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. Determinant points three through five include only college-bound or college attending students for point of comparison. Urbanicity differences were tested using a Pearson chi-squared test with Rao-Scott adjustment. For the median distance variable, I used a quantile regression *t*-statistic for test of significant difference. Stars denote significant difference between pathway subpopulation and the rest of the cohort at that determinant point; * $p < .05$, ** $p < .01$, *** $p < .001$.

***Distance to college.***

In terms of the distance between students' high schools and their postsecondary institutions, aspirant music educators and aspirant musicians may tend to travel farther from home to attend college than the rest of the cohort. At determinant point four, in the college-attending subset of the cohort's early college experiences, the median distance

between music majors' high schools and postsecondary institutions was 59.57 miles. This was significantly further ($t = 3.81$, $p < .001$) than the median distance (35.76 miles) for the rest of the college-attending cohort. Like music majors, music education majors also appear to have traveled father (50.78 miles) than the rest of the cohort, however, this distance was not significantly different from the overall median distance. At the fifth determinant point, three years into college, both music majors and music education majors were significantly farther (59.57 and 53.17 miles, respectively) from the high schools from which they graduated than were the rest of the degree-seeking HSLS cohort (32.79 miles). While education majors were not significantly different from the rest of the college-attending cohort along this metric, this group did have shorter median distances between their high schools and colleges at all three determinant points, as shown in table 4.4.

**Environmental models.**

Below are the results from logistic regressions modeling the effects of high school characteristics on selection into, persistence along, or attrition from each pathway presented by determinant point. For the school urbanicity variables in all six models, I used "suburban" as the reference group. Because there were no occurrences of pathways sharing significant predictors at the same determinant point in the following models, I did not include any inter-pathway comparisons in the environmental analyses.

***Environmental determinant point 1.***

Table 4.5
*Environmental Logistic Models for Being On Pathway at Determinant Point 1*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| Urbanicity | | | |
| City | 0.69 | 0.53 | 1.04 |
| | (0.17) | (0.26) | (0.16) |
| Suburb | Reference | Reference | Reference |
| Town | 0.52* | 1.43 | 0.86 |
| | (0.16) | (0.77) | (0.19) |
| Rural | 0.89 | 1.09 | 1.04 |
| | (0.19) | (0.47) | (0.20) |
| NSLP | 0.99** | 0.99 | 1.00 |
| | (0.004) | (0.01) | (0.004) |
| ELL | 0.99 | 0.98 | 1.00 |
| | (0.01) | (0.02) | (0.01) |
| Minority | 1.00 | 1.00 | 0.99* |
| | (0.004) | (0.01) | (0.004) |
| *N* | 18,780 | - | 18,780 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; Urbanicity results are in comparison to the reference category, "suburb;" * $p < .05$, ** $p < .01$, *** $p < .001$.

At the first determinant point, the combined high school environmental factors examined did not significantly influence individuals' intentions to pursue the music education pathway. Environment factors did contribute to the likelihood of ninth graders indicating intentions to pursue either a teaching or musical profession. Both the aspirant musician ($F[6, 390] = 4.84$, $p < .001$) and the aspirant teacher ($F[6, 390] = 2.37$, $p < .05$) models were significant at the first determinant point suggesting the importance of school

environmental factors in determining who does or does not enter these pathways at the beginning of high school.

There were two predictive variables in the music pathway at this first point. Students attending high schools located in exurban towns were 48% less likely to express the intention to be in a music occupation at age 30. Each percentage point increase in the number of students at a high school eligible for the National School Lunch Program was associated with a two percent decrease in the likelihood of entering the musician pathway in ninth grade.

In addition to the significant EDUC model overall, there was one predictor that achieved statistical significance at the first determinant point. The percentage of racial/ethnic minority students at a high school had a subtle but significantly negative influence on students indicating their intentions to teach at age 30. Each percentage point increase in the number of racial/ethnic minority students at a school was associated with a .8% decrease in the likelihood of pursuing the aspirant educator pathway.

***Environmental determinant point 2.***

Table 4.6
*Environmental Logistic Models for Being On Pathway at Determinant Point 2*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| Urbanicity | | | |
| City | 0.83 | 1.28 | 1.30 |
| | (0.20) | (0.84) | (0.32) |
| Suburb | Reference | Reference | Reference |
| Town | 1.57 | 1.60 | 0.93 |
| | (1.01) | (1.60) | (0.33) |

| | | | |
|---|---|---|---|
| Rural | 0.77 | 0.70 | 1.12 |
| | (0.30) | (0.53) | (0.29) |
| NSLP | 1.00 | 0.98 | 1.00 |
| | (0.01) | (0.02) | (0.01) |
| ELL | 0.99 | 1.07 | 0.98 |
| | (0.03) | (0.05) | (0.02) |
| Minority | 1.01 | 1.01 | 1.00 |
| | (0.01) | (0.01) | (0.005) |
| *N* | 420 | - | 1,080 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; Urbanicity results are in comparison to the reference category, "suburb." $^{*}$ $p < .05$, $^{**}$ $p < .01$, $^{***}$ $p < .001$.

At the second determinant point, three years into high school, none of the environmental predictors reached statistical significance at an alpha of .05 in any of the three environmental models. This finding suggests that high school environmental factors did little to influence students' attrition from music, education, or music education occupation intentions during the first few years of high school.

***Environmental determinant point 3.***

Table 4.7
*Environmental Logistic Models for Being On Pathway at Determinant Point 3*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| Urbanicity | | | |
| City | 0.50$^{*}$ | 0.98 | 1.10 |
| | (0.15) | (0.59) | (0.18) |
| Suburb | Reference | Reference | Reference |
| Town | 0.69 | 1.67 | 1.16 |
| | (0.28) | (1.14) | (0.24) |
| Rural | 0.46$^{*}$ | 0.97 | 1.31 |
| | (0.15) | (0.64) | (0.18) |

| | | | |
|---|---|---|---|
| NSLP | 0.99* | 1.01 | 1.01** |
| | (0.01) | (0.01) | (0.003) |
| ELL | 1.00 | 0.96 | 1.00 |
| | (0.02) | (0.03) | (0.02) |
| Minority | 1.00 | 0.99 | 0.99*** |
| | (0.01) | (0.01) | (0.003) |
| *N* | 9,350 | - | 9,350 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; Urbanicity results are in comparison to the reference category, "suburb." * $p < .05$, ** $p < .01$, *** $p < .001$.

At determinant point three, just after high school, when the college-bound subset of the cohort was asked about their degree intentions, high school environmental factors played a significant predictive role for aspirant music majors ($F[6, 480] = 3.28$, $p < .01$) and aspirant education majors ($F[6, 480] = 7.06$, $p < .001$), but not for aspirant music educators.

Among individuals who said they planned on pursuing a music degree, high school urbanicity was a key determinant. When controlling for all other environmental factors, coming from an urban high school was associated with a 50% lower likelihood of being an aspirant music major while coming from a rural high school was associated with a 54% lower likelihood of pursuing the degree. Additionally, the percentage of NSLP eligible students at the high school had a subtle, but significant impact on pursuing a music degree at this point. Each percentage point increase in NSLP eligible students was associated with about a one percent decrease in the likelihood of indicating music degree intentions.

On the aspirant educator pathway, school population variables were predictive of education degree pursuit. The percentage of students at the high school who were eligible

for the National School Lunch Program was associated with a significant but small effect on the likelihood of pursuing an education degree. A one percentage point increase in NSLP resulted in a one percent increase in the probability of pursuing an education degree. The percentage of racial/ethnic minority students at the high school had a similarly small but negative effect on the likelihood of education degree pursuit. For each percentage point increase in racial/ethnic minority students at a high school the likelihood of pursuing an education degree decreased by approximately one percent.

***Environmental determinant point 4.***

Table 4.8
*Environmental Logistic Models for Being On Pathway at Determinant Point 4*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| Urbanicity | | | |
| City | 1.44 | 2.59 | 0.64 |
| | (1.17) | (6.96) | (0.28) |
| Suburb | Reference | Reference | Reference |
| Town | 0.33 | PS | 0.33* |
| | (0.45) | | (0.17) |
| Rural | 0.40 | 2.19 | 0.58 |
| | (0.24) | (2.92) | (0.24) |
| NSLP | 1.02 | 1.06 | 1.01 |
| | (0.02) | (0.06) | (0.01) |
| ELL | 0.94* | 0.88 | 1.02 |
| | (0.03) | (0.18) | (0.02) |
| Minority | 1.00 | 0.90** | 0.99 |
| | (0.01) | (0.04) | (0.01) |
| Distance | 1.00 | 1.00 | 1.00 |
| | (0.001) | (0.01) | (0.0003) |

| | | | |
|---|---|---|---|
| *N* | 130 | - | 690 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; Urbanicity results are in comparison to the reference category, "suburb." PS denotes perfect success. $^{*}$ $p < .05$, $^{**}$ $p < .01$, $^{***}$ $p < .001$.

At the fourth determinant point, only the music major model proved statistically significant ($F[7, 10] = 24.21$, $p < .001$) overall. Each of the three models had one significantly predictive variable.

Among individuals who indicated that they planned to pursue a music education degree just after high school in determinant point three, but when asked three years later said they were not seriously considering music education at the beginning of college, the percent of minority students at their high school was significantly associated with their likelihood of leaving the degree pathway. A one percentage point increase in the population of racial/ethnic minority students at the high school was associated with a ten percent decrease in the likelihood of staying on the degree path. Additionally, graduating from a high school in an exurban town was a perfect predictor of not leaving the pathway, both of these findings should be taken with cautious skepticism due to the extremely small pathway leaver cell size at this determinant point.

The percentage of ELL students at a high school was significantly associated with music degree attrition at this determinant point. Each percentage point increase in the number of ELL students at the school from which students graduated was associated with a six percent increase in the likelihood of leaving the pathway between determinant points three and four.

High school urbanicity was a significant predictor at this postsecondary determinant point on the aspirant educator pathway. Controlling for all other environmental variables,

individuals who graduated from high schools in exurban towns were three times as likely to leave the educator pathway between post high school intentions and early college.

***Environmental determinant point 5.***

Table 4.9
*Environmental Logistic Models for Being On Pathway at Determinant Point 5*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| Urbanicity | | | |
| City | 0.86 | 1.31 | 0.74 |
| | (0.87) | (1.17) | (0.31) |
| Suburb | Reference | Reference | Reference |
| Town | 3.84 | PS | 0.73 |
| | (2.88) | | (0.35) |
| Rural | 0.35 | 11.69* | 0.64 |
| | (0.20) | (12.12) | (0.24) |
| NSLP | 0.98 | 0.96 | 1.01 |
| | (0.02) | (0.02) | (0.01) |
| ELL | 1.06 | 1.02 | 1.02 |
| | (0.06) | (0.11) | (0.02) |
| Minority | 1.01 | 1.04* | 1.00 |
| | (0.02) | (0.02) | (0.01) |
| Distance | 1.00 | 1.00 | 1.00 |
| | (0.0005) | (0.003) | (0.0004) |
| *N* | 140 | - | 750 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; Urbanicity results are in comparison to the reference category, "suburb." PS denotes perfect success. * $p < .05$, ** $p < .01$, *** $p < .001$.

While none of the three environmental models were significant at the fifth determinant point, there were two significant predictors in the music education model. Graduating from a rural high school was associated with being roughly twelve times as

likely not to leave a music education degree within the first three years of college. As was the case in the prior determinant point, graduating from an exurban school was perfectly predictive of *not* leaving a music education degree by the third year of college. The percentage of racial/ethnic minority students at the high school from which degree-seeking music educators graduated also played a significant role in degree persistence at this point. Each percentage point increase in the number of racial/ethnic minority students at music education majors' former high school was associated with a four percent increase in the likelihood of staying on the degree path.

***Environmental determinant point 6.***

Table 4.10
*Environmental Logistic Models for Being On Pathway at Determinant Point 6*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| Urbanicity | | | |
| City | 1.12 | 4.77 | 0.93 |
| | (0.50) | (5.00) | (0.30) |
| Suburb | Reference | Reference | Reference |
| Town | 0.30 | 9.61 | 1.11 |
| | (0.22) | (12.42) | (0.46) |
| Rural | 0.54 | 4.30 | 1.06 |
| | (0.47) | (3.71) | (0.33) |
| NSLP | 0.99 | 0.99 | 0.99 |
| | (0.02) | (0.02) | (0.01) |
| ELL | 1.00 | 1.13 | 0.99 |
| | (0.05) | (0.14) | (0.01) |
| Minority | 0.99 | 1.01 | 1.00 |
| | (0.02) | (0.02) | (0.01) |

| | | | |
|---|---|---|---|
| Distance | 1.00 (0.0005) | 1.00 (0.001) | 1.00 (0.0002) |
| *N* | 210 | - | 890 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; Urbanicity results are in comparison to the reference category, "suburb." $^{*}$ $p < .05$, $^{**}$ $p < .01$, $^{***}$ $p < .001$.

At the final environmental determinant point, none of the three models were statistically significant at an alpha of .05. These results suggest that three years after high school when individuals are asked about their future career intentions, high school factors that may have been influential in prior years no longer seem to play an important part in aspirant musicians', music educators', or educators' professional ambitions.

**Environmental summary.**

Where students attended high school played an important part in shaping the occupational and educational decisions they made. High school environmental characteristics significantly influenced all three pathways to varying degrees at varying points. On the music and education pathways, environmental factors were predictive of selection into both professional aspirations and degree pursuit.

Attending high schools in exurban towns and schools with high levels of poverty (as measured by NSLP eligibility) were statistically significant deterrents to indicating a future music profession. Attending urban or rural high schools or schools with higher levels of poverty, as reflected by the proportion of NSLP-eligible students, impeded students from pursuing postsecondary music degrees. A higher percentage of ELL students at a high school was linked to higher rates of attrition from the music degree pathway.

Attending a high school with a high percentage of racial/ethnic minority students served as a deterrent to pursuing the teaching profession and to entering an education

degree program. Graduating from high school in the exurbs caused higher rates of attrition from education degrees. Increased levels of school poverty, however, were associated with increased pursuit of education degrees.

On the music education pathway, graduating from a school attended by a high percentage of racial/ethnic minority students resulted in a lower likelihood of starting college as a music education major, but a higher likelihood of being in the degree program three years later.

Schools matter. These results could suggest that American high school students experience differential professional and educational opportunities based on the location and population composition of their schools.

## Profile Equity

With the second research question, 'How do student demographics vary between students on and leaving the music education, music, and education pathways at each determinant point?,' I seek to understand how people's family and demographic profiles impact their chances on each of the three pathways.

In order to address this question, I used a handful of key demographic variables to construct demographic profile models examining how 1) gender, 2) sex, 3) race, 4) ethnicity, 5) socioeconomic status, and 6) parental education interplayed with uptake, persistence, and attrition on the three pathways.

The descriptive results below outline how pathway participants varied from the rest of the cohort along these metrics. The following logistic regression models help to describe how each variable contributed to uptake, persistence, or attrition while controlling for the other predictors.

**Profile descriptive statistics.**

Here I present frequency statistics for the demographic profile variables included in these analyses. As was the case in the preceding section, I use bivariate comparisons to describe how demographic characteristics vary among on-pathway individuals and the rest of the HSLS cohort at each determinant point. In the first, second, and sixth (occupational) determinant points, all bivariate comparisons are in relationship to the full HSLS cohort. For the other determinant points, related to postsecondary degree pursuit, all comparisons are in relationship to only the college-bound or college attending subset of the HSLS cohort.

***Race and ethnicity.***

Race and ethnicity appear to have played significant roles throughout most of the educator pathway. As shown in table 4.11, the aspirant teacher and education major populations were significantly different from the rest of the HSLS population at all determinant points. At each determinant point of the education pathway, White individuals were over-represented while Black students, Hispanic students, and students of more than one race were under-represented. White over-representation among aspirant teachers was evident from ninth grade when White students made up two-thirds (67%) of the group as opposed to just over half (52%) of the cohort. This trend peaked just after high school graduation at the third determinant point where White students made up 74% of the individuals planning to pursue education degrees while accounting for only 56% of the college-bound population.

Table 4.11

*Race and Ethnicity by Pathway and Determinant Point with Bivariate Comparisons*

| Determinant Point 1 | | | | |
|---|---|---|---|---|
| **Race/Ethnicity** | **MUSC** | **MUED** | **EDUC**** $F(3.19, 1570) = 4.97$ | **HSLS Total** |
| American Indian | < 0.01 | 0.00 | < 0.01 | 0.01 |
| Asian | 0.03 | 0.01 | 0.02 | 0.03 |
| Black | 0.11 | 0.08 | 0.08 | 0.13 |
| Hispanic | 0.18 | 0.25 | 0.17 | 0.22 |
| Two or more | 0.08 | 0.08 | 0.05 | 0.08 |
| Hawaiian/Pac. Isl. | < 0.01 | 0.00 | < 0.01 | 0.01 |
| White | 0.60 | 0.57 | 0.67 | 0.52 |
| **Determinant Point 2** | | | | |
| **Race/Ethnicity** | **MUSC** | **MUED** | **EDUC**** $F(3.35, 1660) = 4.85$ | **HSLS Total** |
| American Indian | 0.01 | 0.01 | 0.00 | 0.01 |
| Asian | 0.01 | 0.01 | 0.02 | 0.03 |
| Black | 0.23 | 0.08 | 0.11 | 0.15 |
| Hispanic | 0.17 | 0.20 | 0.14 | 0.21 |
| Two or more | 0.11 | 0.07 | 0.04 | 0.08 |
| Hawaiian/Pac. Isl. | < 0.01 | 0.00 | < 0.01 | 0.01 |
| White | 0.47 | 0.63 | 0.69 | 0.52 |
| **Determinant Point 3** | | | | |
| **Race/Ethnicity** | **MUSC** | **MUED** | **EDUC***** $F(4.69, 2300) = 9.28$ | **HSLS Total** |
| American Indian | 0.00 | 0.01 | < 0.01 | 0.01 |
| Asian | 0.01 | 0.01 | 0.01 | 0.04 |
| Black | 0.09 | 0.01 | 0.08 | 0.12 |
| Hispanic | 0.27 | 0.13 | 0.13 | 0.19 |
| Two or more | 0.11 | 0.05 | 0.04 | 0.07 |
| Hawaiian/Pac. Isl. | 0.00 | 0.00 | < 0.01 | < 0.01 |
| White | 0.51 | 0.78 | 0.74 | 0.56 |

| Determinant Point 4 | | | | |
|---|---|---|---|---|
| **Race/Ethnicity** | **MUSC** | **MUED** | **EDUC*** *F*(4.49, 2210) = 6.37 | **HSLS Total** |
| American Indian | 0.00 | 0.01 | 0.00 | 0.01 |
| Asian | 0.01 | 0.01 | 0.01 | 0.04 |
| Black | 0.10 | 0.08 | 0.09 | 0.12 |
| Hispanic | 0.34 | 0.08 | 0.15 | 0.20 |
| Two or more | 0.07 | 0.05 | 0.04 | 0.08 |
| Hawaiian/Pac. Isl. | 0.00 | 0.00 | < 0.01 | < 0.01 |
| White | 0.47 | 0.78 | 0.71 | 0.54 |

| Determinant Point 5 | | | | |
|---|---|---|---|---|
| **Race/Ethnicity** | **MUSC** | **MUED** | **EDUC*** *F*(3.10, 1530) = 3.20 | **HSLS Total** |
| American Indian | 0.00 | 0.01 | < 0.01 | 0.01 |
| Asian | 0.02 | 0.01 | 0.01 | 0.04 |
| Black | 0.10 | 0.10 | 0.09 | 0.12 |
| Hispanic | 0.40 | 0.13 | 0.18 | 0.20 |
| Two or more | 0.06 | 0.05 | 0.04 | 0.07 |
| Hawaiian/Pac. Isl. | 0.00 | 0.00 | 0.01 | < 0.01 |
| White | 0.42 | 0.70 | 0.67 | 0.55 |

| Determinant Point 6 | | | | |
|---|---|---|---|---|
| **Race/Ethnicity** | **MUSC** | **MUED** | **EDUC*** *F*(4.57, 2260) = 4.91 | **HSLS Total** |
| American Indian | < 0.01 | 0.00 | < 0.01 | 0.01 |
| Asian | 0.03 | 0.01 | 0.02 | 0.04 |
| Black | 0.23 | 0.01 | 0.07 | 0.14 |
| Hispanic | 0.13 | 0.39 | 0.17 | 0.22 |
| Two or more | 0.13 | 0.02 | 0.06 | 0.08 |
| Hawaiian/Pac. Isl. | 0.00 | < 0.01 | < 0.01 | < 0.01 |
| White | 0.47 | 0.58 | 0.67 | 0.52 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. Determinant points three through five include only college-bound or college attending students for point of comparison. Hispanic category includes individuals of any racial category, all other categories exclude Hispanic. Stars denote significant difference on adjusted chi-squared test between pathway racial/ethnic distribution and the rest of the cohort at that determinant point; * $p < .05$, ** $p < .01$, *** $p < .001$.

While not significantly different from the HSLS population at an alpha of .05 at any determinant point, the music education pathway population appears to closely resemble the racial/ethnic makeup of the education pathway. White over-representation among

aspirant music educators peaked at 78% at determinant points three and four in the early college phase. These data may suggest possible underrepresentation by Black students and Asian students throughout the pathway, and underrepresentation among Hispanic students within postsecondary music education degree pursuit. As figure 4.3b shows, Black underrepresentation reached a pathway low at determinant point three with Black students accounting for only one percent of recent high school graduates who planned to pursue music education degrees.

Among aspirant musicians, race did not appear to play a major determinant role in either professional aspiration or degree pursuit. Although, not statistically different from the rest of the HSLS population at any determinant point, as shown in table 4.11, Hispanic students appear to have been over-represented among aspirant musicians along most of the pathway. Additionally, as can be seen in figure 4.3a, Black students dropped from the music pathway for the duration of degree pursuit in determinant points three through five. Although, again these results were not statistically significant.

At the sixth determinant point, when individuals were asked, three years after high school what their anticipated occupation at 30 would be, race and ethnicity do not appear to have been significantly associated with intended pursuit of music or music education.

Figure 4.3a

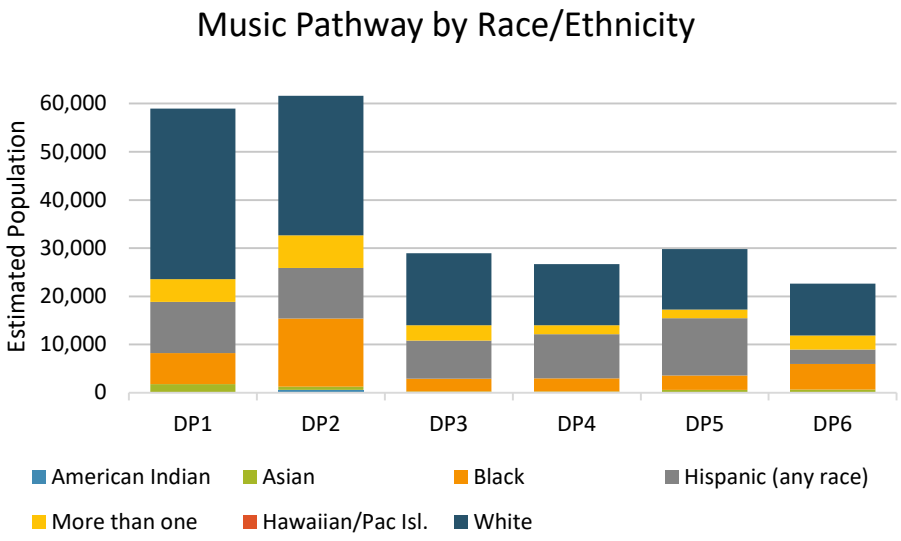



Figure 4.3b

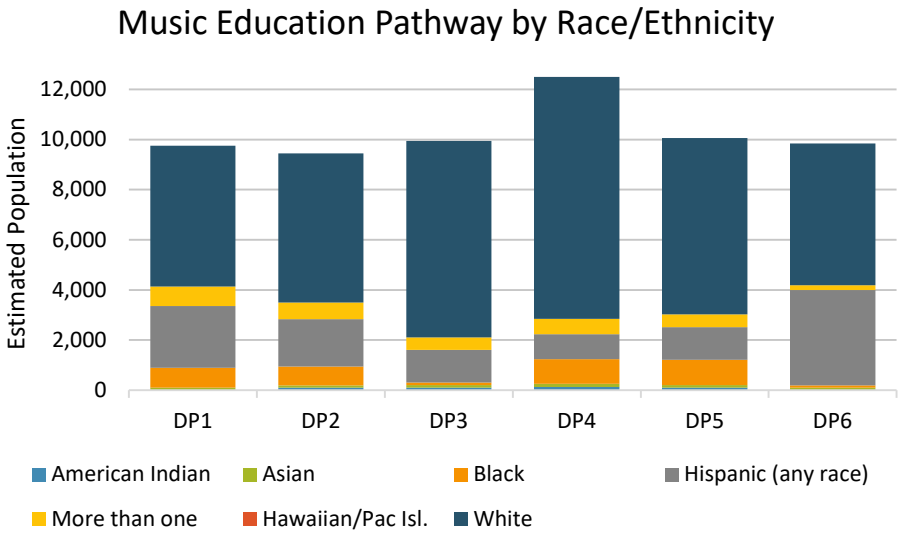
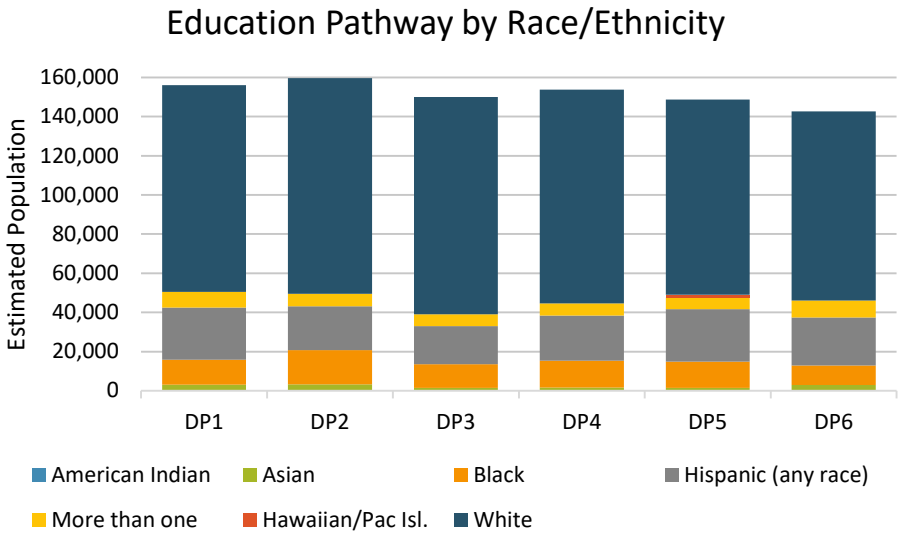


Figure 4.3c




***Socioeconomic status.***

Among aspirant music educators, socioeconomic status appears to have been an important determinant along the pathway. As shown in figure 4.4b and table 4.12, the upper three socioeconomic quintiles accounted for the vast majority of individuals pursuing the music education pathway. This point is most apparent at determinant point five, three years into college, where individuals from the lower two quintiles accounted for only 6% of music education degree seekers. Interestingly, the upper two quintiles show a decline in the final determinant point among individuals who intended to teach music at age 30.

While less drastic than the socioeconomic pattern shown along the music education pathway, the aspirant musician pathway followed a similar shape (figure 4.4a). Although relatively balanced during the high school years, the upper socioeconomic strata appeared to predominate among aspirant musicians in the postsecondary years.

The music and educator pathways were significantly different from the HSLS population only in the final determinant point with both pathways showing under-representation from the lower two socioeconomic quintiles.

Table 4.12
*Socioeconomic Quintile Distribution by Pathway and Determinant Point*

| **HSLS Cohort** | | | | | | |
|---|---|---|---|---|---|---|
| **SES Quintile** | **DP1** | **DP2** | **DP3** | **DP4** | **DP5** | **DP6** |
| 1st (lowest) | 0.19 | 0.19 | 0.13 | 0.14 | 0.13 | 0.19 |
| 2nd | 0.20 | 0.20 | 0.17 | 0.17 | 0.17 | 0.20 |
| 3rd | 0.20 | 0.20 | 0.19 | 0.19 | 0.19 | 0.20 |
| 4th | 0.20 | 0.20 | 0.23 | 0.23 | 0.23 | 0.20 |
| 5th (highest) | 0.20 | 0.20 | 0.28 | 0.26 | 0.28 | 0.20 |
| **Music Pathway** | | | | | | |
| **SES Quintile** | **DP1** | **DP2** | **DP3** | **DP4** | **DP5** | **DP6*** $F(3.49, 1720) = 3.32$ |
| 1st (lowest) | 0.17 | 0.23 | 0.15 | 0.12 | 0.13 | 0.08 |
| 2nd | 0.18 | 0.14 | 0.16 | 0.10 | 0.11 | 0.09 |
| 3rd | 0.18 | 0.24 | 0.17 | 0.25 | 0.18 | 0.25 |
| 4th | 0.21 | 0.17 | 0.22 | 0.18 | 0.26 | 0.30 |
| 5th (highest) | 0.26 | 0.21 | 0.30 | 0.34 | 0.32 | 0.29 |
| **Music Education Pathway** | | | | | | |
| **SES Quintile** | **DP1** | **DP2*** $F(3.61, 1780) = 2.56$ | **DP3** | **DP4** | **DP5*** $F(3.47, 1710) = 2.74$ | **DP6*** $F(2.76, 1370) = 3.01$ |
| 1st (lowest) | 0.07 | 0.07 | 0.12 | 0.14 | 0.03 | 0.04 |
| 2nd | 0.14 | 0.10 | 0.11 | 0.09 | 0.03 | 0.05 |
| 3rd | 0.29 | 0.25 | 0.22 | 0.20 | 0.26 | 0.42 |
| 4th | 0.25 | 0.22 | 0.14 | 0.18 | 0.27 | 0.18 |
| 5th (highest) | 0.26 | 0.35 | 0.41 | 0.40 | 0.41 | 0.31 |
| **Education Pathway** | | | | | | |
| **SES Quintile** | **DP1** | **DP2** | **DP3** | **DP4** | **DP5** | **DP6*** $F(3.18, 1570) = 2.98$ |
| 1st (lowest) | 0.15 | 0.18 | 0.11 | 0.13 | 0.13 | 0.14 |
| 2nd | 0.16 | 0.19 | 0.17 | 0.15 | 0.14 | 0.16 |
| 3rd | 0.20 | 0.18 | 0.20 | 0.18 | 0.19 | 0.19 |
| 4th | 0.22 | 0.22 | 0.24 | 0.24 | 0.26 | 0.26 |
| 5th (highest) | 0.27 | 0.24 | 0.28 | 0.29 | 0.28 | 0.25 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. Determinant points three through five include only college-bound or college attending students for point of comparison. Stars denote significant difference on adjusted chi-squared test between pathway socioeconomic distribution and the rest of the cohort at that determinant point; * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 4.4a

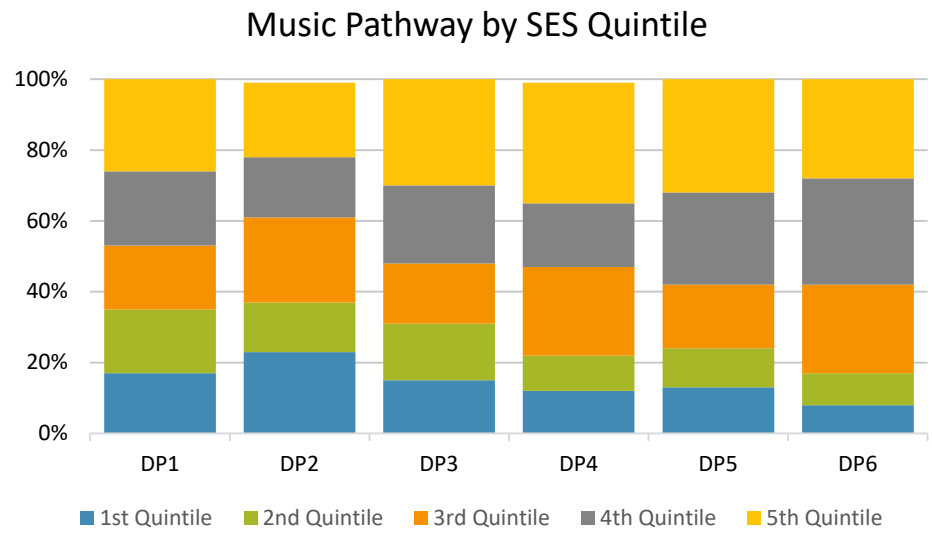



Figure 4.4b

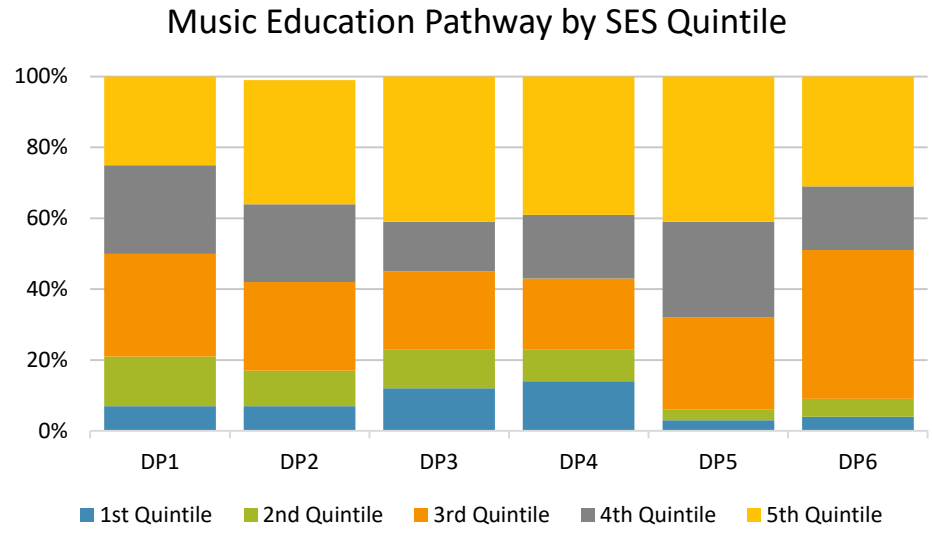
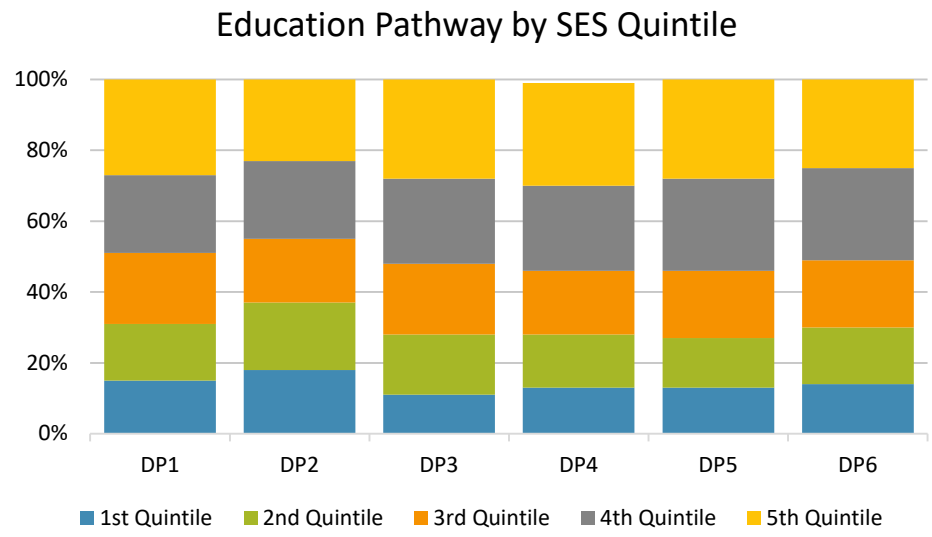


Figure 4.4c




***Sex.***

Along sex lines, the music education pathway more closely resembles the music pathway than it does the education pathway. While females made up over three quarters of individuals pursuing the (non-music) teaching profession across all six determinant points, males made up majorities in both the music and music education pathways. The only exception being in the initial ninth grade point when females accounted for a slight majority of aspirant music teachers.

As can be seen in table 4.13, determinant points four and six were the only times the music education pathway was significantly different from the HSLS population at large. At determinant point four, at the beginning of college, roughly two thirds (64%) of the aspirant music education degree-seekers were male while women held a slight majority (53%) of the college-bound population. At determinant point six, three years after high school, men accounted for nearly three-quarters (73%) of those who intended to teach music at age 30.

Along the aspirant musician pathway, male over-representation was evident throughout and statistically significant from the third through sixth determinant points. The aspirant educator pathway, on the other hand, showed significant female over-representation across the entire scope of inquiry.

Table 4.13
*Proportion Female by Pathway and Determinant Point*

| Determinant Point | MUSC | MUED | EDUC | HSLS Total |
|---|---|---|---|---|
| 1 | .44 | .53 | .82*** $F(1, 490) = 172.70$ | .50 |
| 2 | .41 | .43 | .78*** $F(1, 480) = 111.27$ | .54 |
| 3 | .34*** $F(1, 490) = 11.36$ | .38 | .78*** $F(1, 490) = 81.25$ | .53 |
| 4 | .36** $F(1, 490) = 7.04$ | .36* $F(1, 490) = 4.84$ | .79*** $F(1, 490) = 78.95$ | .53 |
| 5 | .35** $F(1, 490) = 8.03$ | .41 | .76*** $F(1, 490) = 51.78$ | .54 |
| 6 | .29*** $F(1, 490) = 13.69$ | .27* $F(1, 490) = 4.33$ | .78*** $F(1, 490) = 102.13$ | .50 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. Determinant points three through five include only college-bound or college attending students for point of comparison. At determinant point two in the HSLS total, men had a higher nonresponse rate than women on the occupational aspiration question. Stars denote significant difference on adjusted chi-squared test between pathway sex distribution and the rest of the cohort at that determinant point; * $p < .05$, ** $p < .01$, *** $p < .001$.

***First generation degree seeker.***

With the exception of the last determinant point, aspirant music educators appear to have been slightly more likely than average to have had at least one parent who completed postsecondary education. At the first determinant point, in ninth grade, individuals who expressed the intention to teach music at age 30 were significantly less likely than their peers to not have a parent with a postsecondary degree. One quarter

(25%) of ninth grade aspirant music teachers did not have parents with postsecondary degrees while the overall average among the HSLS population was closer to half (47%). Ninth graders who expressed interest in teaching non-musical subjects showed a similar pattern as aspirant music educators at this point. Thirty-eight percent of aspirant teachers did not have at least one parent with a postsecondary degree. While ninth grade aspirant musicians significantly more frequently had college educated parents than the rest of the cohort, the individuals on this pathway at successive points did not consistently maintain this difference.

Table 4.14
*Proportion without a College Educated Parent by Pathway and Determinant Point*

| Determinant Point | MUSC | MUED | EDUC | HSLS Total |
|---|---|---|---|---|
| 1 | .37*<br>$F(1, 490) = 6.21$ | .25**<br>$F(1, 490) = 7.27$ | .38**<br>$F(1, 490) = 7.48$ | .47 |
| 2 | .49 | .31 | .35**<br>$F(1, 490) = 10.08$ | .44 |
| 3 | .35 | .28 | .32 | .35 |
| 4 | .35 | .32 | .34 | .37 |
| 5 | .37 | .25 | .31 | .35 |
| 6 | .31 | .45 | .32***<br>$F(1, 490) = 15.21$ | .45 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. Determinant points three through five include only college-bound or college attending students for point of comparison. Stars denote significant difference on adjusted chi-squared test between pathway college educated parent proportion and the rest of the cohort at that determinant point; * $p < .05$, ** $p < .01$, *** $p < .001$.

**Profile models.**

Below are the results from logistic regressions modeling the effects of profile demographics on selection into, persistence along, or attrition from each pathway

presented by determinant point. For the socioeconomic quintile variables in all six models, I used the third or middle quintile as the comparison group.

***Profile determinant point 1.***

Table 4.15
*Profile Logistic Models for Being On Pathway at Determinant Point 1*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| White | 1.20 | 1.08 | 2.18*** |
| | (0.21) | (0.45) | (0.34) |
| Female | 0.82 | 1.35 | 4.82*** |
| | (0.14) | (0.52) | (0.67) |
| SES Quintile | | | |
| 1st (Lowest) | 1.12 | 0.30 | 0.82 |
| | (0.34) | (0.20) | (0.19) |
| 2nd | 0.95 | 0.35 | 1.01 |
| | (0.27) | (0.20) | (0.20) |
| 3rd | Reference | Reference | Reference |
| 4th | 1.09 | 0.69 | 1.02 |
| | (0.28) | (0.41) | (0.18) |
| 5th (Highest) | 1.08 | 0.66 | 1.21 |
| | (0.25) | (0.37) | (0.20) |
| First Generation | 0.71 | 0.54 | 0.95 |
| | (0.16) | (0.261) | (0.14) |
| *N* | 17,310 | - | 17,310 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; SES results are in comparison to the 3rd quintile reference category. * $p < .05$, ** $p < .01$, *** $p < .001$.

At the first determinant point, profile variables were significant predictors only of entry into the aspirant teacher pathway. Controlling for all other demographic variables in the model, White ninth graders were over twice as likely ($OR = 2.18$, $p < .001$) to indicate

an age 30 teaching occupation and women were nearly five times ($OR = 4.82$, $p < .001$) as likely to do so. The aspirant educator model was significant at this first determinant point at an alpha of .001 ($F[7, 490] = 23.45$).

***Profile determinant point 2.***

Table 4.16
*Profile Logistic Models for Being On Pathway at Determinant Point 2*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| White | 0.96 | 2.13 | 1.49 |
| | (0.31) | (1.67) | (0.37) |
| Female | 0.51* | 0.46 | 1.05 |
| | (0.16) | (0.37) | (0.23) |
| SES Quintile | | | |
| 1st (Lowest) | 3.20** | 0.04* | 2.69* |
| | (1.12) | (0.06) | (1.11) |
| 2nd | 1.15 | 1.39 | 1.31 |
| | (0.69) | (1.52) | (0.56) |
| 3rd | Reference | Reference | Reference |
| 4th | 1.07 | 0.53 | 0.84 |
| | (0.64) | (0.49) | (0.28) |
| 5th (Highest) | 1.47 | 1.49 | 0.69 |
| | (0.76) | (1.41) | (0.24) |
| First Generation | 1.58 | 2.34 | 0.41* |
| | (0.61) | (2.23) | (0.14) |
| *N* | 390 | - | 980 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; SES results are in comparison to the 3rd quintile reference category. * $p < .05$, ** $p < .01$, *** $p < .001$.

At the second determinant point, only the aspirant musician model was significant ($F[7, 50] = 3.25$, $p < .01$). While neither of the other two models were significant, all three models had significant pathway predictors.

Socioeconomic status proved a significant predictor overall at this point. Among aspirant music teachers, coming from a household in the lowest socioeconomic quintile was associated with a 96% increase in the likelihood of changing occupational intentions from music education to something else in the eleventh grade. This means students in the first SES quintile were 25 times more likely to shift their attentions away from music education in the first three years of high school. Among aspirant teachers, this trend was reversed with lowest SES quintile status associated with nearly three to one odds (OR = 2.70, $p < .05$) of being on the aspirant teacher pathway. Although the opposite directional impact low socioeconomic status had on these two pathway determinations makes obvious the difference, SURE postestimation could not confirm a significant difference of effect from first SES quintile status between the two pathways ($t = -1.92$, $p = .06$). Similar to aspirant educators, among aspirant musicians, coming from the lowest socioeconomic quintile was associated with approximately three to one odds (OR = 3.20, $p < .01$) of staying on the musician pathway at this point. As was the case when comparing the music educator and educator models, SURE could not confirm a statistically significant difference in the predictive strength of this variable between the music and music education models ($t = 1.68$, $p = .10$). These nonsignificant outcomes in both comparisons may suggest interpreting the music education model with caution at this determinant point.

Sex was also a significant predictor at the second determinant point of the aspirant musician pathway. Controlling for all other demographic variables, women were twice as likely to leave the aspirant musician pathway between ninth and eleventh grades (OR = .51, $p < .05$).

Having parents who did not attend college was a significant predictor of leaving the aspirant teacher pathway at this determinant point. Controlling for the other demographic variables, students without a college educated parent were nearly two and a half times as likely (OR = 0.41, $p < .05$) to change their mind about pursuing the teaching profession in eleventh grade.

***Profile determinant point 3.***

Table 4.17
*Profile Logistic Models for Being On Pathway at Determinant Point 3*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| White | 0.85 | 2.96 | 2.57*** |
| | (0.21) | (1.80) | (0.38) |
| Female | 0.37*** | 0.62 | 3.53*** |
| | (0.10) | (0.26) | (0.53) |
| SES Quintile | | | |
| 1st (Lowest) | 1.88 | 0.60 | 1.12 |
| | (1.32) | (0.75) | (0.28) |
| 2nd | 1.63 | 0.73 | 1.07 |
| | (0.76) | (0.59) | (0.25) |
| 3rd | Reference | Reference | Reference |
| 4th | 0.84 | 0.71 | 0.83 |
| | (0.33) | (0.41) | (0.17) |

| | | | |
|---|---|---|---|
| 5th (Highest) | 0.79 | 1.49 | 0.76 |
| | (0.30) | (0.98) | (0.15) |
| First Generation | 0.46 | 1.27 | 0.81 |
| | (0.27) | (1.05) | (0.17) |
| *N* | 9,920 | - | 9,920 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; SES results are in comparison to the 3rd quintile reference category. * $p < .05$, ** $p < .01$, *** $p < .001$.

All three models were significant at the third determinant point. Despite the aspirant music educator model ($F[7, 490] = 2.48$, $p < .05$) achieving statistical significance at this point, no individual variables were statistically significant within this model. In the aspirant musician ($F[7, 480] = 3.06$, $p < .01$) and educator ($F[7, 480] = 17.06$, $p < .001$) models, sex and race/ethnicity were predictive factors modeling selection into aspirant degree-seeker pathways at the third determinant point.

Being female resulted in opposite influences between the musician and educator models. Among recent high school graduates intending to pursue postsecondary education, controlling for all other demographic variables, females were three and a half (OR = 3.53, $p < .001$) times more likely to indicate intentions to pursue an education degree. Among the same group of recent high school graduates, females were 2.7 times less likely to pursue a (non-education) music degree.

As was the case with selection into the aspirant teacher pathway in determinant point one, Whiteness was also a significant predictor of selection into the education degree pathway at the third determinant point. Controlling for all other demographic variables in the model, being White was associated with over two and half (OR = 2.57, $p < .001$) times increased likelihood of indicating plans to pursue a postsecondary education degree program.

While having college educated parents resulted in increased attrition from the aspirant teacher population in the previous determinant point as discussed above, in the context of only degree-seeking students in determinant point three, first generation college-goer status did not play a significantly predictive influence on the aspirant educator pathway.

***Profile determinant point 4.***

Table 4.18
*Profile Logistic Models for Being On Pathway at Determinant Point 4*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| White | 0.38* | 24.07* | 1.42 |
| | (0.17) | (30.26) | (0.57) |
| Female | 1.79 | PS | 1.54 |
| | (0.83) | | (0.57) |
| SES Quintile | | | |
| 1st (Lowest) | 0.81 | PS | 1.98 |
| | (0.67) | | (1.47) |
| 2nd | 0.44 | PS | 1.31 |
| | (0.36) | | (0.65) |
| 3rd | Reference | PS | Reference |
| 4th | 0.85 | 0.61 | 0.97 |
| | (0.44) | (0.87) | (0.56) |
| 5th (Highest) | 3.27 | Reference | 0.75 |
| | (2.29) | | (0.41) |
| First Generation | 1.97 | 0.08 | 0.72 |
| | (1.16) | (0.13) | (0.41) |
| *N* | 140 | - | 730 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; SES results are in comparison to the 3rd quintile reference category except in the MUED model where 3rd quintile was perfect success; 5th quintile is used this model instead. PS denotes perfect success. * $p < .05$, ** $p < .01$, *** $p < .001$.

At the fourth determinant point, between postsecondary degree intentions and early college degree pursuit, only the musician model was significant ($F[7, 10] = 36.37$, $p < .001$. At this point, being White was associated with a little over two and a half times increased likelihood of leaving the music degree pathway. Despite the music educator model not proving significant overall at this point, like the musician model, Whiteness was a significant predictor within the model. Being White resulted in 24 times increased likelihood of being in a music education degree rather than leaving a music education degree track (OR = 24.07, $p < .05$). A SURE postestimation comparison between these two models was not able to show significant difference in the predictive strength of Whiteness ($t = 1.59$, $p = .12$). This outcome likely owes to the extremely small pathway leaver cell size in the music education model at determinant point four.

Additionally, as can be seen in table 4.18, a number of variables resulted in perfect success outcomes in the music education model. As discussed at this determinant point in the environmental models and referenced above, the fourth music education model should be interpreted with extreme caution.

***Profile determinant point 5.***

Table 4.19
*Profile Logistic Models for Being On Pathway at Determinant Point 5*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| White | 0.39 | 0.28 | 0.44* |
| | (0.26) | (0.30) | (0.18) |
| Female | 1.03 | 1.57 | 0.58 |
| | (0.32) | (1.35) | (0.24) |
| SES Quintile | | | |
| 1st (Lowest) | 22.82** | 0.01* | 1.23 |
| | (30.13) | (0.02) | (0.72) |

| | | | |
|---|---|---|---|
| 2nd | 2.53<br>(2.29) | 0.04*<br>(0.05) | 1.88<br>(1.05) |
| 3rd | Reference | Reference | Reference |
| 4th | 3.70<br>(2.40) | 1.39<br>(1.34) | 1.13<br>(0.55) |
| 5th (Highest) | 7.15*<br>(5.10) | PS | 0.61<br>(0.25) |
| First Generation | 4.28<br>(4.77) | 1.28<br>(1.73) | 0.47<br>(0.20) |
| *N* | 130 | - | 690 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; SES results are in comparison to the 3rd quintile reference. PS denotes perfect success. * $p <$ .05, ** $p <$ .01, *** $p <$ .001.

While all three models had significant predictor variables at the fifth determinant point, only the music education ($F$[6, 50] = 4.22, $p <$ .01) and music ($F$[7, 10] = 6.07, $p <$ .05) models were significant at an alpha of .05. The education model was close, but did not clear the threshold alpha for significance ($F$[7, 120] = 2.07, $p$ = .052).

In the music educator model at this point, low SES resulted in increased probability of leaving a music education degree between the beginning of college and the three year mark. Second SES quintile music education degree seekers were almost 24 times more likely to leave the degree program while first SES quintile music education majors were 83 times more likely to leave the degree. There was no variance in this model among highest quintile music education degree-seekers with all members of this group remaining on the degree pathway.

Controlling for all other demographic variables, White students (OR = .44, $p <$ .05) were roughly twice as likely to leave education degrees in the first three years of college.

In the context of the race/ethnicity descriptive statistics seen in table 4.11, this finding suggests that the 33% minority of education degree-seekers who are people of color could be a more persistent subset along the degree pathway than their White peers.

In the musician model, status at the extreme ends of the SES quintiles resulted in increased likelihood of still being on the music degree seeking pathway. Highest SES quintile status resulted in a 7.15 times increase in likelihood of still being in a music degree three years into college while lowest SES quintile status resulted in approximately 23 times greater odds of being on the degree pathway as opposed to off. Considering the overall downward population trend among aspirant musicians from the lowest SES quintile between determinant points two and four, as seen in figure 4.4a, the relatively high positive influence of first SES quintile status at this fifth determinant point suggests that the smaller slice of lower SES aspirant musicians who made it into the degree program were more persistent than their middle class music degree-seeking peers.

Comparing the impact of low SES at this determinant point between music majors and music education majors shows an opposite effect on degree persistence. Low SES music majors were more likely to stay in the degree program while low SES music education majors were less likely to persist. SURE postestimation confirmed the difference of effect between the two models for first SES quintile status ($t$ = -2.70, $p$ < .01). A SURE postestimation of highest SES quintile status between these two models suggests a statistically stronger effect on persistence within the aspirant musician model ($t$ = -4.45, $p$ < .001).

***Profile determinant point 6.***

Table 4.20
*Profile Logistic Models for Being On Pathway at Determinant Point 6*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| White | 0.75 | 1.21 | 1.31 |
| | (0.38) | (0.99) | (0.37) |
| Female | 0.87 | 0.33 | 1.43 |
| | (0.58) | (0.27) | (0.39) |
| SES Quintile | | | |
| 1st (Lowest) | 0.31 | 0.31 | 0.76 |
| | (0.36) | (0.56) | (0.35) |
| 2nd | 1.09 | Empty† | 0.79 |
| | (1.57) | | (0.35) |
| 3rd | Reference | Reference | Reference |
| 4th | 1.88 | 0.63 | 1.43 |
| | (1.93) | (0.61) | (0.47) |
| 5th (Highest) | 1.42 | 1.76 | 1.26 |
| | (0.89) | (1.76) | (0.38) |
| First Generation | 0.68 | 2.44 | 1.30 |
| | (0.75) | (2.51) | (0.52) |
| *N* | 250 | - | 940 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; SES results are in comparison to the 3rd quintile reference. † There were no MUED sample members from the 2nd SES quintile at this determinant point. $^{*}$ $p < .05$, $^{**}$ $p < .01$, $^{***}$ $p < .001$.

At the sixth and final determinant point, only the aspirant musician pathway model was significant ($F[7, 30] = 2.43$, $p < .05$). There were no significant demographic predictors within any of the models. These results suggest that, while selection into and out of these occupational pathways may have been mitigated by demographic factors in

the high school years, three years after high school, demographic variables, taken collectively, may be predictive of persistence on the music pathway, but did not significantly predict persistence or attrition from the other two occupational pathways. This outcome coupled with significant sex and SES variance from the rest of the HSLS cohort at the sixth determinant point, as shown in the descriptive statistics, suggests that the underlying processes driving trends away from socioeconomic diversity and toward sex imbalance in the occupational pathways primarily occurred *before* the postsecondary years.

**Profile summary.**

As demonstrated by these results, demographic profile played a significant role in the music, education, and music education pathways. At five out of the six determinant points, these variables significantly influenced uptake, persistence, and attrition along at least one of the pathways.

As suggested by prior research (Broughman & Rollefson, 2000), the education pathway was significantly Whiter than the rest of the HSLS cohort. In the present study, Whiteness increased the likelihood of uptake into both professional teacher aspirations and education degree pursuit. At the point of degree persistence, however, Whiteness appears to have been a deterrent to staying on the education degree track. This outcome could mean that while fewer people of color enter education degree programs, those who do persist at higher rates than their White peers. Increased persistence likelihood among people of color, however, is likely not enough to offset the overwhelming Whiteness of the incoming education degree-seeking population rendering the postsecondary output a still predominantly White teacher population.

Although the music education pathway was not significantly different from the rest of the cohort in terms of race/ethnicity, the close resemblance between the music education and education pathways along racial/ethnic distribution could suggest that the two paths share similar challenges with racial and ethnic homogeneity. At one point in music education degree pursuit, Whiteness served as a significant boon to persistence, however, as mentioned above the small cell size at this determinant point could undermine the veracity of this specific result.

As suggested in prior research (Grisé, 2019), Whiteness was not statistically predictive of undergraduate music degree pursuit or persistence. This trait was, however, predictive of attrition from the music degree track. While descriptive data above showing a drop-off in Black pursuit of music degrees could lend some tenuous evidence for Koza's (2008) hypothesis regarding a Whiteness audition barrier to music degree programs, these results overall cannot statistically support her claim.

Sex operated differently between the music and education pathways, but significantly influenced both paths. Being female negatively influenced uptake and persistence on the music path while, on the education path, being female positively influenced uptake into the professional and degree tracks. Although sex was not an influential determinant along the music education pathway, music educators appeared to resemble the male dominated musician population.

Descriptive statistics showed socioeconomic imbalance along the music education pathway with the scales tipping toward higher SES and away from lower SES. Modeling results confirmed that coming from a lower socioeconomic bracket impeded persistence along both music teacher occupational pursuit and music education degree paths. On the

music and education pathways, however, coming from the lowest socioeconomic group increased persistence likelihood at various points.

Individuals who pursued the professional music, music teacher, and teacher pathways had parents with postsecondary degrees more frequently than the HSLS cohort overall. However, having a college educated parent did not serve as an influential predictor of persistence within the context of these models.

Persistent musicians, educators, and music educators are not created equally. The demographic profile conditions people were born into made significant differences in their future success in pursuit of these three fields.

## Navigational Equity

My third research question, 'How do student actions, choices, and expressed values regarding high school, college, and careers vary between students on and leaving the music education, music, and education pathways at each determinant point?,' investigates how individuals directly contributed to their navigation of occupational and educational paths.

In order to answer this question, I used a combination of individual actions, beliefs, values, and intentions to model navigation of the three pathways. Individual actions are represented by high school GPA and music class enrollment. Respondent beliefs include the amount of thought given to occupational intentions and certainty of occupational outcomes. Value variables include students' main reasons for pursuing degrees, the importance of societal contribution, and the importance of salary. Finally, intentions are represented by the aspirational alignment variable comparing degree intentions with occupational plans.

Results below illustrate how individuals directly impacted their own navigation of the music, education, and music education pathways.

**Navigational descriptive statistics.**

As done in the two prior sections discussing environmental equity and profile equity, I present here descriptive statistics of navigational predictors of on-pathway individuals for the three models. For each variable I include bivariate analyses comparing pathway averages with the rest of the HSLS cohort. For determinant points examining the occupational pathways (one, two, and six), I make pathway to cohort comparisons with the full HSLS cohort. For determinant points investigating degree pursuit and persistence (three, four, and five), I make comparisons only to the college-bound or college attending subset of the HSLS cohort at the determinant point in question. Although not included in the predictive models to follow, I discuss below the response frequency among pathway leavers of the main reasons for changing degree track.

***Music enrollment.***

Individuals on all three pathways enrolled in music classes at their schools significantly more frequently than their cohort peers at all six determinant points. Among the three pathways, aspirant music educators enrolled in music classes the most frequently.

In the ninth grade year, at the first determinant point, 88% of aspirant music educators enrolled in at least one music class at their school. Just over half (52%) of aspirant musicians took a music class, just over a third (34%) of aspirant educators did so, and just under a quarter (22%) of the total cohort was enrolled in at least one ninth grade music class. By the end of their third year of high school, aspirant music educators averaged

over two and a half (2.67) years of participation in the school music program while aspirant musicians averaged 1.57, aspirant educators averaged .90, and the overall cohort averaged .59 years of participation in music classes. Shown in table 4.21 and figure 4.5, at each of the postsecondary determinant points, individuals on the music education pathway averaged nearly four years of participation in their high school music programs.

As discussed in the previous chapter, this measure accounts for the number of years that students took at least one music class and does not consider the number of classes taken per year.

Table 4.21

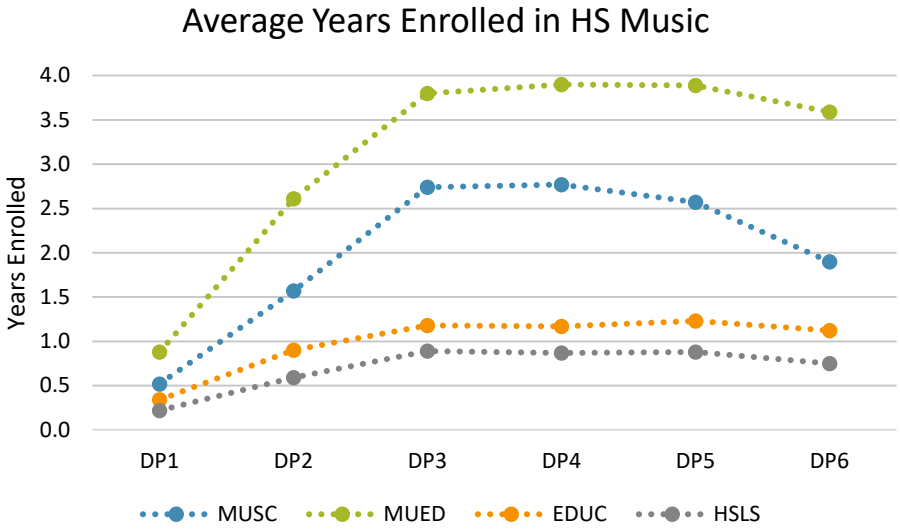
*High School Coursework Navigational Variables by Pathway and Determinant Point*

| **Variable by DP** | **Pathway** | | | |
|---|---|---|---|---|
| **Yrs. of HS Music at DP** | **MUSC** | **MUED** | **EDUC** | **HSLS Total** |
| 1 | 0.52*** $F(1, 490) = 61.62$ | 0.88*** $F(1, 490) = 106.97$ | 0.34*** $F(1, 490) = 23.34$ | 0.22 |
| 2 | 1.57*** $F(1, 490) = 93.93$ | 2.61*** $F(1, 490) = 256.20$ | 0.9*** $F(1, 490) = 24.01$ | 0.59 |
| 3 | 2.74*** $F(1, 490) = 103.79$ | 3.80*** $F(1, 490) = 1,010.28$ | 1.18*** $F(1, 490) = 13.25$ | 0.89 |
| 4 | 2.77*** $F(1, 490) = 106.01$ | 3.90*** $F(1, 490) = 1,583.35$ | 1.17*** $F(1, 490) = 11.18$ | 0.87 |
| 5 | 2.57*** $F(1, 490) = 49.67$ | 3.89*** $F(1, 490) = 1,094.46$ | 1.23*** $F(1, 490) = 13.35$ | 0.88 |
| 6 | 1.90*** $F(1, 490) = 20.94$ | 3.59*** $F(1, 490) = 226.33$ | 1.12*** $F(1, 490) = 21.71$ | 0.75 |
| **Cumulative HS GPA at DP** | | | | |
| 1 | 2.65 | 2.96* $F(1, 490) = 4.42$ | 2.99*** $F(1, 490) = 63.61$ | 2.59 |
| 2 | 2.43*** $F(1, 483) = 13.79$ | 3.01** $F(1, 480) = 7.05$ | 2.89*** $F(1, 480) = 39.77$ | 2.62 |
| 3 | 2.99 | 3.32*** $F(1, 490) = 16.14$ | 3.07** $F(1, 490) = 9.88$ | 2.97 |

| | | | | |
|---|---|---|---|---|
| 4 | 2.95 | 3.22*<br>$F(1, 490) = 10.48$ | 3.00 | 2.92 |
| 5 | 3.02 | 3.19*<br>$F(1, 490) = 6.18$ | 3.01 | 2.96 |
| 6 | 2.57 | 3.13***<br>$F(1, 490) = 11.49$ | 3.04***<br>$F(1, 490) = 85.84$ | 2.63 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. Determinant points three through five include only college-bound or college attending students for point of comparison. Stars denote significant difference on Adjusted Wald test between pathway subpopulation and the rest of the cohort at that determinant point; * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 4.5




***GPA.***

Aspirant music educators had significantly higher GPAs than the rest of the cohort at all six determinant points and higher GPAs than the two parallel pathways at all but the first determinant point. In the ninth grade year, aspirant music educators had a subtly lower average GPA (2.96 on a four-point scale) than aspirant educators (2.99). As table 4.21 shows, on average, both aspirant educators and aspirant music educators maintained GPAs at or above a 3.0 at all four postsecondary data points.

Students who, in their third year of high school, expressed intentions to pursue a non-teaching musical profession had a significantly lower average GPA than the rest of the cohort. While the cohort accumulated average GPA was 2.62 during the class' modal junior year, aspirant musicians averaged a 2.43 GPA. This difference is significant at an alpha of .001.

***Salary importance.***

Among the three pathways three years after high school, only aspirant (non-music) teachers appear to have been different from the rest of the cohort when considering the overall importance of salary in their occupational intentions. On a ten-point index of the importance of salary compared to a number of other job factors with ten indicating salary as more important than all other factors, aspirant educators averaged 3.90 while the overall cohort averaged 4.37. This difference is significant at an alpha of .001. Aspirant music teachers and professional musicians were not significantly different from the rest of the cohort on this index, averaging 4.30 and 4.26, respectively.

Table 4.22
*Occupation Preference Navigational Variables by Pathway at Determinant Point 6*

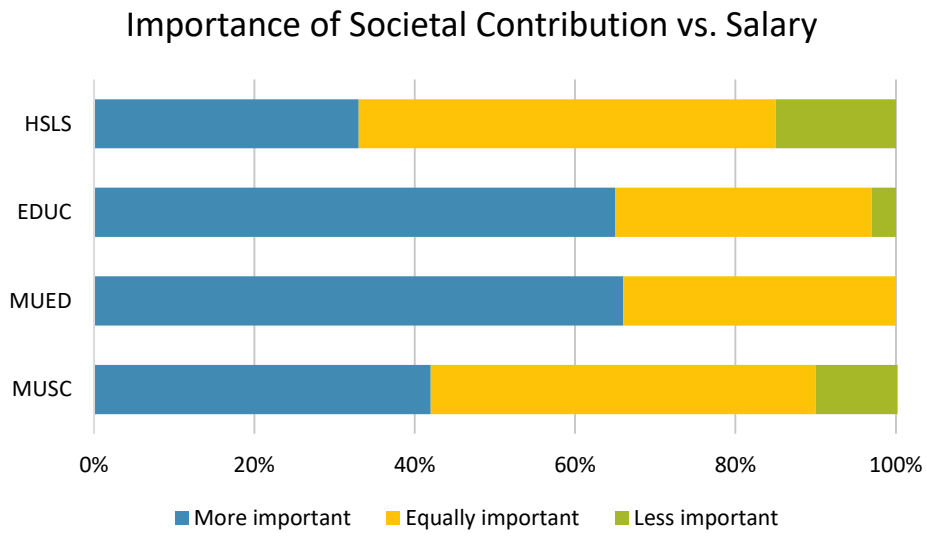
| | **Pathway** | | | |
|---|---|---|---|---|
| | **MUSC** | **MUED** | **EDUC** | **HSLS Total** |
| Average Importance of Salary (0 – 10) | 4.26 | 4.30 | 3.90*** $F(1, 490) = 25.79$ | 4.37 |
| | **MUSC** | **MUED*** $F(1.52, 750) = 4.07$ | **EDUC*** $F(1.98, 980) = 105.03$ | **HSLS Total** |
| Societal Contribution vs. Salary Importance | | | | |
| More Important | 0.42 | 0.66 | 0.65 | 0.33 |
| Equally Important | 0.48 | 0.34 | 0.32 | 0.52 |
| Less Important | 0.11 | 0.00 | 0.03 | 0.15 |
| Total | 1.00 | 1.00 | 1.00 | 1.00 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. Average salary difference calculated as an Adjusted Wald test; societal contribution differences calculated as an adjusted chi-squared test. Stars denote significant difference between pathway subpopulation and the rest of the cohort; * $p < .05$, ** $p < .01$, *** $p < .001$.

***Contribution to society.***

When asked about the importance of the contribution their occupation would make to society in comparison to the salary they would earn, aspirant teachers and aspirant music teachers diverged from the rest of the cohort in their preference for societal contribution over salary (figure 4.6). Approximately two thirds of the individuals on both pathways (MUED = 66%, EDUC = 65%) at the final determinant point indicated that the contribution their future job would make to society was a more important consideration than salary. In contrast, only 42% of aspirant musicians and roughly one third (33%) of the overall cohort believed societal contribution was more important than salary. Both aspirant educators' and aspirant music educators' differences from the rest of the cohort were significant at an alpha of .001. Only three percent of aspirant educators and no aspirant music educators indicated that salary was *more* important than societal contribution. The remainder of the two groups valued societal contribution and salary equally.

Figure 4.6




***Job thought and job certainty.***

When asked, during the ninth and eleventh grade data collection waves, how much thought they had given their intended age 30 occupation, only aspirant musicians reported giving significantly more thought to their future profession than the rest of the cohort. Aspirant music educators appear to have given a similar amount of thought to their future jobs as aspirant musicians, however this group was not significantly different from the rest of the cohort along this metric. Overall, the amount of thought students gave to their future occupations increased slightly from ninth to eleventh grade, as can be seen in table 4.23.

When asked about their level of certainty of achieving their intended age 30 occupation at the sixth determinant point, only those who intended to teach in non-music areas were significantly more certain than the rest of the cohort about their intentions. On a three point scale with one being “not certain at all” and three being “very certain,” aspirant educators averaged 2.58 as opposed to the cohort’s overall average of 2.43

occupational certainty at this final point. Aspirant music teachers, as shown in table 4.23, averaged the highest level of occupational certainty at the sixth determinant point, however this group was not significantly different from the rest of the cohort. As was the case with the amount of thought given to future occupations, occupational certainty also appears to have uniformly increased between the second and sixth determinant points where this question was asked.

Table 4.23
*Aspirational Occupation Thought and Certainty by Pathway and Determinant Point*

| | MUSC | MUED | EDUC | HSLS Total |
|---|---|---|---|---|
| **Thought given to occupation at DP†** | | | | |
| 1 | 3.67* $F(1, 490) = 5.27$ | 3.69 | 3.53 | 3.58 |
| 2 | 3.91*** $F(1, 490) = 29.02$ | 3.83 | 3.75 | 3.74 |
| **Occupational certainty at DP‡** | | | | |
| 2 | 2.29 | 2.47 | 2.25 | 2.27 |
| 6 | 2.47 | 2.63 | 2.58*** $F(1, 490) = 23.15$ | 2.43 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. † Thought given to occupation ranges from 1 ("not at all") to 4 ("a lot"). ‡ Occupational certainty ranges from 1 ("not certain") to 3 ("very certain"). Stars denote significant difference between pathway subpopulation and the rest of the cohort on an Adjusted Wald test; * $p < .05$, ** $p < .01$, *** $p < .001$.

***Aspirational alignment.***

As may be expected, professional aspirations and degree aspirations were significantly positively correlated at determinant points three through six (table 4.24).

Table 4.24
*Occupation & Degree Alignment by Pathway and Determinant Point with Unweighted Correlations*

| Alignment at DP | MUSC | | MUED | | EDUC | |
|---|---|---|---|---|---|---|
| | % Aligned | *r* (*t*) | % Aligned | *r* (*t*) | % Aligned | *r* (*t*) |
| 3 | 50 | .40*** (5.44) | 58 | .55*** (5.65) | 58 | .54*** (16.07) |
| 4 | 68 | .47*** (3.70) | 46 | .48*** (5.21) | 46 | .46*** (12.24) |
| 5 & 6 | 23 | .40*** (4.55) | 72 | .80*** (4.02) | 57 | .66*** (19.25) |

*Note.* Stars represent *t*-test significance of the unweighted correlation; * $p < .05$, ** $p < .01$, *** $p < .001$.

Music education majors had moderate to strong positive correlations suggesting a good deal of aspirational alignment at the four determinant points. At determinant point three, 58% of high school graduates who intend to pursue a music education degree had recent interest in having a job teaching music. This number dropped slightly to 46% at determinant point four during aspirant music educators' early college experiences. Three years into college, 72% of music education majors intended to be teaching music at age 30. This number aligns closely with prior research showing that approximately 70% of music education majors pursue music teaching jobs after degree completion (Gillespie & Hamann, 1999; Thornton & Bergee, 2008).

Non-education music majors followed a quite different trend from their music education peers. Half (50%) of recent high school graduates who planned to pursue a college music degree expressed interest one year prior in a musical occupation. When asked near the end of high school at determinant point four, this number rose with 68% of fledgling music majors having indicated some kind of musical occupation. At determinant point five, three years into college, the proportion of current music majors

who still intended to work professionally in music fell dramatically to 23%. Throughout the four determinant points examined, unweighted correlations suggest individuals on the music pathway had moderately weak alignment between their degrees and future professions.

The inverse relationship music education majors and music majors had with their intended occupations mirrors Allen's (2003) findings regarding music and music education major vocational identity shifts during the undergraduate years. While music education major occupational intentions to teach music appear to have strengthened over the course of the degree program, music major intentions to work in their field seem to have diminished over the first three years of college.

Education major occupational alignment resembles trends among music education majors with moderate to moderately strong positive correlation between degree pursuit and occupational intention at all four determinant points. Like music education majors, education majors had the strongest correlation in their pathway at determinant points five and six where 57% of education majors three years into college said they planned to be teaching at age 30.

***Main reason for choosing major.***

Among individuals who declared music education as their first major at determinant point five, enjoying the coursework in the major was the most frequently listed main reason for choosing a music education degree, accounting for just under half (46%) of respondents' primary reasons. Wanting a degree that would lead to a job that would contribute to society was the next most frequently picked main reason among music education majors accounting for just over a third (37%) of respondents' primary reason.

No music education majors listed high earning potential or ideal work/life balance as their primary reason for selecting the major. Despite some quite apparent differences from the response frequencies of the overall cohort (as shown in table 4.25), the music education major responses did not achieve statistically significant difference from the rest of the cohort.

Non-music education majors—whose primary reasons for choosing the degree closely align with those of music education majors, as illustrated in figure 4.7—were significantly different from the rest of the cohort at an alpha of .001. Music education and education majors roughly aligned with the college-enrolled subset of the HSLS cohort on their enjoyment of the coursework. Both sets of aspirant educators' proclivities toward societal contribution were considerably more common than the rest of the cohort.

Music majors were also significantly different from the rest of the cohort, however this group had a slightly different profile of primary degree selection reasons than the other two pathways. The vast majority (71%) of music majors chose the degree primarily because they enjoy the courses in the major. The next most common main reason for selecting a music major was because the individual does well in the courses. In contrast to the other two pathways, music majors fell about ten percentage points *below* the overall percentage of students who selected their degree primarily to contribute to society.

As can be seen in table 4.25, high earning potential and job availability were much less frequently cited by all three degree fields than they were in the overall percentage of students who chose these as the main reasons for choosing their majors.

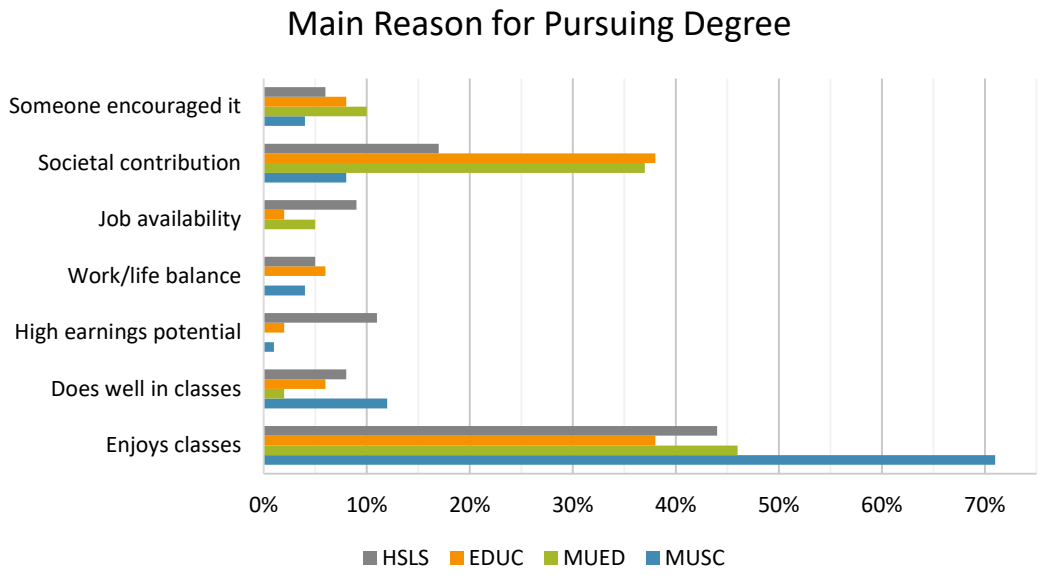
Table 4.25

*Proportional Distribution of Main Reason for Choosing Primary Degree by Pathway*

| **Main Reason for Choosing Degree** | **MUSC**** *F*(3.22, 1580) = 3.86 | **MUED** | **EDUC**** *F*(3.92, 1930) = 16.97 | **College-Attending HSLS Total** |
|---|---|---|---|---|
| Enjoys classes the in field | 0.71 | 0.46 | 0.38 | 0.44 |
| Does well in classes in the field | 0.12 | 0.02 | 0.06 | 0.08 |
| High earnings potential | 0.01 | - | 0.02 | 0.11 |
| Work/life balance from jobs in field | 0.04 | - | 0.06 | 0.05 |
| Job availability | < 0.01 | 0.05 | 0.02 | 0.09 |
| Societal contribution | 0.08 | 0.37 | 0.38 | 0.17 |
| Someone else encouraged it | 0.04 | 0.10 | 0.08 | 0.06 |
| Total | 1.00 | 1.00 | 1.00 | 1.00 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. Stars denote significant difference on adjusted chi-squared test between choice distribution on the pathway and the rest of the cohort; * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 4.7



***Main reason for changing majors.***

Among individuals who started college as music education majors but left the field for another degree within the next three years, becoming more interested in another degree was the most frequently cited (32%) reason for leaving music education. The next most frequently chosen reasons for leaving the degree were not enjoying the coursework (22%) and work/life balance difficulties associated with music teaching jobs (16%). The distribution of primary reasons for leaving a music education degree track was not significantly different from the distribution of responses given by all degree-changing members of the overall cohort.

Individuals who started college as education majors and left the degree also did so most frequently in pursuit of a degree in which they were more interested (42%). The next most frequently listed main reasons students left education degrees were because they preferred the job opportunities available from another major (19%) followed by not enjoying the education coursework (14%). The distribution of education major reasons for leaving the degree was significantly different from the cohort's responses at an alpha of .001.

Students most frequently left music majors primarily because of the low earning potential associated with jobs in music (19%). Becoming more interested in another degree and preferring jobs in another field were the next most frequent reasons students gave for leaving a music degree program, each accounting for 14% of the group's primary reasons. Eleven percent of students who started college as music majors left the degree primarily because they felt they did not fit in with the other people in the major. The frequency of this response among former music majors is ten percentage points

higher than it is in the overall cohort. No members of this group indicated that they left the music major because they were not doing well in the courses.

The full distribution of primary reasons students left their degrees can be seen in table 4.26.

Table 4.26
*Frequency Distribution of the Main Reason Degree Leavers Left by Pathway*

| **Main Reason for Leaving Degree** | **MUSC*** $F(9.66, 3880) = 4.90$ | **MUED** | **EDUC*** $F(8.39, 3370) = 3.81$ | **Degree-Changing HSLS Total** |
|---|---|---|---|---|
| Intended major was not available | 0.03 | 0.08 | 0.02 | 0.06 |
| Did not enjoy courses in major | 0.07 | 0.22 | 0.14 | 0.17 |
| Not doing well in courses | - | 0.05 | 0.02 | 0.12 |
| Low earning jobs in field | 0.19 | - | 0.11 | 0.03 |
| Work/life hard in field | 0.09 | 0.16 | 0.01 | 0.02 |
| Work does not contribute to society | 0.05 | - | < 0.01 | 0.01 |
| Not enough jobs available in field | 0.05 | - | - | 0.01 |
| Someone discouraged you | 0.10 | - | 0.03 | 0.03 |
| Did not fit in with others in major | 0.11 | 0.01 | 0.01 | 0.01 |
| Time issue/Other responsibilities | 0.02 | 0.05 | 0.05 | 0.04 |
| More interested in other major | 0.14 | 0.32 | 0.42 | 0.37 |
| Liked jobs in other major better | 0.14 | 0.11 | 0.19 | 0.13 |
| Total | 1.00 | 1.00 | 1.00 | 1.00 |

*Note.* All sample counts in *F* statistics have been rounded to the nearest ten. Stars denote significant difference on adjusted chi-squared test between choice distribution among pathway leavers and the rest of the cohort; * $p < .05$, ** $p < .01$, *** $p < .001$.

**Navigational models.**

Below are the results from logistic regressions modeling the effects of individual navigational choices on selection into, persistence along, or attrition from each pathway

presented by determinant point. The comparison group for the variable describing the amount of thought given to occupation intentions was "somewhat." For the variable describing individuals' levels of certainty about occupational intentions, I used "fairly certain" as the reference category. For the variable indicating the main reason students pursued a degree, the comparison group was the answer "because I do well in the courses in the major." For the variable comparing the importance of salary with making a societal contribution, the reference category was "equally important."

The analytic sample counts for these models are somewhat lower than in the environmental and demographic profile analyses because the models used in this section relied on students' transcript data availability from the 2013 data collection wave. Students without transcript data were omitted from these analyses.

***Navigational determinant point 1.***

Table 4.27
*Navigational Logistic Models for Being On Pathway at Determinant Point 1*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| Music enrollment | 4.04*** | 23.11*** | 1.40** |
| | (0.65) | (12.08) | (0.16) |
| 9th grade GPA | 0.89 | 1.14 | 1.63*** |
| | (0.07) | (0.30) | (0.13) |
| Think about occupation | | | |
| Not at all | 1.39 | PF | 0.27 |
| | (1.04) | | (0.25) |
| A little | 0.67 | 0.81 | 1.01 |
| | (0.23) | (0.64) | (0.21) |
| Somewhat | Reference | Reference | Reference |

| | | | |
|---|---|---|---|
| A lot | 1.10 | 1.23 | 0.76 |
| | (0.20) | (0.50) | (0.11) |
| *N* | 13,410 | - | 13,410 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; Occupational thought results are in comparison to the reference category, "somewhat." PF denotes perfect failure. $^{*}$ $p < .05$, $^{**}$ $p < .01$, $^{***}$ $p < .001$.

At the first determinant point, all three navigational models were significantly predictive of selection into each of the three occupational pathways.

In the music educator model ($F[4, 490] = 10.29$, $p < .001$), unsurprisingly, enrollment in at least one music class during the ninth grade year served as a strong predictor of indicating future music teaching aspirations. School music enrollment, when controlling for GPA and the amount of thought given to occupational intentions, was associated with being 23 times ($p < .001$) more likely to indicate age 30 music teaching aspirations in the ninth grade. Additionally, all members of the aspirant music educator population indicated that they had given at least some thought to their occupational intentions causing a perfect failure in this model for those students who said they had given no thought to their age 30 occupation.

As was the case among aspirant music educators, ninth grade music enrollment contributed to the predictive significance of the aspirant musician model ($F[5, 480] = 15.84$, $p < .001$). Controlling for ninth grade GPA and the amount of thought given to occupational intentions, enrolling in at least one music class was significantly associated with being approximately four times (OR = 4.04, $p < .001$) more likely to express interest in pursuing professional music. A SURE postestimation between the music educator and musician models showed that ninth grade music enrollment was a stronger predictor ($t = 3.28$, $p \leq .001$) of selection into the music educator pathway than it was for the musician pathway.

In the aspirant educator model ($F[5, 480] = 10.97$, $p < .001$), ninth grade GPA was a significant predictor with higher GPAs linked to higher likelihood of indicating plans to become a teacher. Controlling for music enrollment and the amount of thought given to occupational intentions, each one point increase in overall ninth grade GPA translated into 63% increased likelihood of being an aspirant teacher. Music enrollment was also a significant predictor in the educator model at the first determinant point. Controlling for the other two variables, ninth grade music enrollment increased the likelihood of being an aspirant music teacher by approximately 40% (OR = 1.40, $p < .01$). As was the case when comparing the previous two models on the music enrollment variable, SURE postestimation showed that ninth grade music enrollment was again a significantly stronger predictor of being an aspirant music educator ($t = 5.17$, $p < .001$) than it was of being an aspirant teacher.

***Navigational determinant point 2.***

Table 4.28
*Navigational Logistic Models for Being On Pathway at Determinant Point 2*

| | (1)<br>**MUSC** | (2)<br>**MUED** | (3)<br>**EDUC** |
|---|---|---|---|
| Music enrollment | 1.18<br>(0.16) | 0.55<br>(0.26) | 1.11<br>(0.11) |
| Cumulative GPA | 0.52**<br>(0.12) | 2.02<br>(0.90) | 0.96<br>(0.20) |
| Think about occupation | | | |
| Not at all | PS | Empty† | PS |
| A little | 2.43<br>(1.87) | 0.37<br>(0.72) | 2.83<br>(2.92) |
| Somewhat | Reference | Reference | Reference |

| | | | |
|---|---|---|---|
| A lot | 7.86*** | 0.96 | 1.04 |
| | (3.43) | (1.13) | (0.31) |
| Occupational certainty | | | |
| Very certain | 0.64 | 4.96* | 1.01 |
| | (0.19) | (3.82) | (0.22) |
| Fairly certain | Reference | Reference | Reference |
| Not certain | 0.94 | 5.16 | 0.96 |
| | (0.62) | (6.52) | (0.36) |
| *N* | 440 | - | 1,070 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; Occupational thought results are in comparison to the reference category, "somewhat;" occupational certainty are in reference to "fairly certain." PS denotes perfect success. † There were no MUED sample members who responded "not at all" at this determinant point. * $p < .05$, ** $p < .01$, *** $p < .001$.

When asked again about occupational intentions two years later in the third year of high school, only the aspirant musician model was significant ($F[6, 70] = 6.14$, $p < .001$). Among students who indicated plans to be professional musicians at age 30 but who no longer had those intentions in eleventh grade, cumulative GPA appears to have been a driving factor. Each one GPA point increase—when controlling for occupational thought, occupational certainty, and music enrollment—approximately doubled the likelihood of leaving the aspirant musician pathway (OR = .52, $p < .01$). Additionally, the amount of thought given to occupational intentions was also a significant predictor of persistence on the aspirant musician pathway. Students who indicated that they had given "a lot" of thought to their future occupations were nearly eight times less likely (OR = 7.86, $p < .001$) to have left the aspirant musician pathway.

Although the model was not significant overall at this determinant point, aspirant music teachers who had a high degree of occupational certainty were approximately five times more likely (OR = 4.96, $p < .05$) to remain on the pathway three years into high school.

While music enrollment was a significant predictor in all three models in the previous determinant point, the number of years students were involved in music classes at their schools by the third year of high school was not a significant predictor of leaving any of the occupational pathways.

***Navigational determinant point 3.***

Table 4.29
*Navigational Logistic Models for Being On Pathway at Determinant Point 3*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| Music enrollment | 1.77*** | 3.57*** | 1.10* |
| | (0.21) | (0.90) | (0.05) |
| Cumulative GPA | 0.81 | 1.12 | 1.23 |
| | (0.22) | (0.49) | (0.14) |
| Aspirant Alignment | 47.05*** | 127.60*** | 39.15*** |
| | (19.78) | (67.54) | (6.74) |
| *N* | 7,980 | - | 7,980 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; * $p < .05$, ** $p < .01$, *** $p < .001$.

At the third determinant point, as was the case when modeling selection into the occupational pathways at determinant point one, all three models were predictive of college-bound recent high school graduates indicating intentions to pursue one of the three degrees of interest.

In the aspirant music education major model ($F[3, 490] = 45.04$, $p < .001$), when controlling for GPA, the number of years students enrolled in high school music classes and students' eleventh grade occupational intentions to pursue the music teaching profession each served as significant predictors of pursuing a music education degree pathway. Each additional year of high school music enrollment was associated with approximately three and half times higher likelihood (OR = 3.57, $p < .001$) of pursuing a music education degree. Recent high school graduates with the aspirant music educator average of four years of music enrollment (table 4.21), were over 14 times more likely to pursue a music education degree than the rest of the college-bound cohort. Having expressed music teaching occupational interest in eleventh grade was associated with being 128 times more likely to pursue a music education degree program.

The aspirant music major model ($F[3, 470] = 105.24$, $p < .001$) paralleled the aspirant music education major model at this determinant point with music enrollment and eleventh grade occupational intentions both significantly predictive of selection into the pathway. Each year of music enrollment represented on students' high school transcripts translated into a 78% increase in their likelihood of pursuing a music degree. When compared with the music education major model using SURE postestimation, music enrollment proved a significantly stronger predictor ($t = 2.46$, $p < .05$) among aspirant music education majors than it was among aspirant music majors. Expressing interest in eleventh grade in being a professional musician translated into 47 times higher likelihood (OR = 47.05, $p < .001$) of pursuing a music degree. When comparing the predictive strength of aspirational alignment between the music and music education models, the

strength of the predictor was not significantly different between the two pathways ($t$ = 1.55, $p$ = .12).

Like the other two models at this determinant point, music enrollment and occupational aspiration alignment contributed to the significance of the education major model ($F$[3, 470] = 160.27, $p < .001$). Each year of high school music enrollment was associated with a ten percent increase in the likelihood of pursuing an education degree. As was the case when comparing the other two models along this metric, music enrollment was again a significantly stronger predictor ($t$ = 4.54, $p < .001$) of music education degree pursuit than it was for education majors in other subject areas. Indicating age 30 teaching intentions in the eleventh grade was associated with having nearly 40 times higher likelihood (OR = 39.15, $p < .001$) of pursuing a teacher education degree program. Occupational aspiration alignment, when compared with the music education model using SURE postestimation was a significantly stronger predictor ($t$ = 2.15, $p < .05$) among music education degree seekers than it was among those seeking education degrees.

***Navigational determinant point 4.***

Table 4.30
*Navigational Logistic Models for Being On Pathway at Determinant Point 4*

| | (1) | (2) | (3) |
|---|---|---|---|
| | **MUSC** | **MUED** | **EDUC** |
| Music enrollment | 1.04 | 3.48* | 1.03 |
| | (0.08) | (1.87) | (0.12) |
| Cumulative GPA | 1.26 | 0.42 | 0.84 |
| | (0.42) | (0.34) | (0.25) |

| | | | |
|---|---|---|---|
| Aspirant Alignment | 2.71** | 0.39 | 0.98 |
| | (0.68) | (0.51) | (0.35) |
| *N* | 100 | - | 620 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; * $p < .05$, ** $p < .01$, *** $p < .001$.

At the fourth determinant point, only the aspirant music major model was significant ($F[3, 10] = 17.22$, $p < .001$). Within this model, aspirational alignment was a significant predictor of persistence on the degree track. Having expressed interest in pursuing a music profession in the eleventh grade was associated with nearly three times higher likelihood (OR = 2.71, $p < .01$) of maintaining interest in pursuing a music degree between the end of high school and early college remembrances.

There was one significant predictor in the music education model at this point. The number of years of music classes students had on their high school transcripts was significantly associated with persistence on the music education degree track between the third and fourth determinant points. Each year of music on high school transcripts translated into 3.48 times higher likelihood ($p < .05$) of not leaving the music education degree track between the third and fourth determinant points.

***Navigational determinant point 5.***

Table 4.31
*Navigational Logistic Models for Being On Pathway at Determinant Point 5*

| | (1) **MUSC** | (2) **MUED** | (3) **EDUC** |
|---|---|---|---|
| Music enrollment | 0.94 | 0.20 | 1.20 |
| | (0.15) | (0.20) | (0.17) |
| Cumulative GPA | 0.56 | 0.02* | 0.35** |
| | (0.22) | (0.03) | (0.11) |
| Aspirant Alignment | 1.28 | PS | 17.17*** |
| | (0.69) | | (8.18) |
| Main reason for choosing degree | | | |
| Enjoys classes | 2.62 | 1.11 | 1.39 |
| | (1.58) | (1.89) | (1.01) |
| Does well in classes | Reference | Reference | Reference |
| High earnings | 0.12*** | PF | 0.74 |
| | (0.04) | | (0.56) |
| Work/life balance | 0.44 | PF | 1.05 |
| | (0.55) | | (0.89) |
| Job availability | 0.03*** | PF | 0.19 |
| | (0.01) | | (0.19) |

| | | | |
|---|---|---|---|
| Societal contribution | 1.92 | 102.30* | 2.47 |
| | (1.69) | (183.10) | (1.91) |
| Someone encouraged | 1.61 | 99.84* | 1.49 |
| | (2.41) | (204.40) | (1.32) |
| *N* | 130 | - | 690 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; PS denotes perfect success; PF denotes perfect fail. * $p < .05$, ** $p < .01$, *** $p < .001$.

At the fifth determinant point modeling persistence or attrition from each of the three degree tracks, only the education navigational model was statistically significant at an alpha of .05 ($F[9, 120] = 6.36$, $p < .001$). However, in addition to significant predictors in the education model, each of the other two models also contained significant predictors at this point. Note that, due to my inclusion of the Main Reason variable at this determinant point, only students indicating music, education, or music education as their *primary* major are included in this set of analyses.

Cumulative high school GPA was associated with a negative impact on persistence in music education degree programs. Each full GPA point increase resulted in approximately 43 times increased likelihood of leaving the degree between the beginning of college and the third year postsecondary data collection point. This result contrasts with Brown and Alley's (1983) findings which suggested a positive correlation between GPA and music education degree persistence.

The main reason students indicated pursuing their major was significantly associated with persistence on the music education degree path. Choosing a degree primarily

because it would contribute to society resulted in music education majors being approximately 100 times more likely to remain in the degree program (OR = 102.3, $p < .05$). Selecting a degree program primarily because someone else encouraged it was also associated with approximately 100 times increased likelihood (OR = 99.84, $p < .05$) of persisting through a music education degree program. Students who indicated that the primary reason for choosing their current degree was because of earnings potential, job availability, or professional work/life balance opportunities all left the music education degree path for other degree areas.

All of the students included in the music educator model who indicated age 30 music teaching aspirations during the final data collection wave and who started a music education degree at the beginning of college were still in the music education degree three years later. This result parallels the strong correlation between music education degree pursuit and music teaching aspirations discussed in the above descriptive statistics However, these two results do not perfectly align due to missing value deleted cases in the logistic model.

In the music major model, the only significant predictors of attrition from music degree programs involved the perceived availability and earnings potential of jobs upon completion of the degree. Students who stated that their primary reason for choosing their degree was because of the availability of jobs in the field were 34.36 times more likely ($p < .001$) to start and then leave a music degree program by the third year of college. Those who indicated their primary reason for pursuing their degree was because of high earnings potential post-graduation were over eight times more likely to leave a music degree program (OR = .12, $p < .001$). These findings suggest that students who remained

in a music degree program were less concerned with their job prospects and future earnings than their degree-leaving counterparts. Students who started the degree and considered employment or earnings potential as high priorities, on the other hand, sought out alternative fields within the first three years of college. This outcome is supported in the descriptive statistics showing that the most frequently cited reason for leaving a music degree was low earning expectations in the field. Coupled with the insignificance of the occupational alignment variable among aspirant musicians at this determinant point and the weak correlation between music degree seekers and music occupational aspirations shown in the descriptive statistics, these findings portray pursuit of a music degree as only tenuously related to occupational outcomes.

As was the case in the music education model, high school GPA was a significantly negative predictor in the education model at the fifth determinant point. A one point GPA increase was associated with being almost three times more likely (OR = .35, $p < .001$) to leave an education degree program. The predictive strength of high school GPA in the music education model was not significantly different from the variable's strength in this model ($t = -1.16$, $p = .25$). These results suggest that both music education and education degree programs had a harder time retaining students who performed academically well in high school than they did with students who had lower high school GPAs.

Occupational alignment served as a significant predictor in the education model. Indicating age 30 teaching aspirations was significantly associated with being 17 times more likely ($p < .001$) not to leave an education degree program by the third year of college. This result mirrors the moderately strong positive correlation found between

education degree pursuit and professional teaching aspirations as discussed in the descriptive statistics.

***Navigational determinant point 6.***

Table 4.32
*Navigational Logistic Models for Being On Pathway at Determinant Point 6*

| | (1) | (2) | (3) |
|---|---|---|---|
| | **MUSC** | **MUED** | **EDUC** |
| Music enrollment | 0.83 | 1.47 | 0.89 |
| | (0.24) | (0.86) | (0.08) |
| Cumulative GPA | 2.02 | 3.69 | 1.05 |
| | (1.31) | (4.33) | (0.26) |
| Aspirant Alignment | 1.46 | 1,307.00*** | 12.51*** |
| | (0.91) | (2,538.20) | (4.91) |
| Occupation certainty | | | |
| Very certain | 1.17 | 30.42* | 1.22 |
| | (0.96) | (44.87) | (0.53) |
| Fairly certain | Reference | Reference | Reference |
| Not certain | 1.35 | 0.74 | 0.36 |
| | (1.51) | (0.96) | (0.21) |

| | | | |
|---|---|---|---|
| Societal contribution vs. salary | | | |
| More important | 0.72 | 391.20** | 1.70 |
| | (0.48) | (738.10) | (0.71) |
| Equally important | Reference | Reference | Reference |
| Less important | 0.96 | Empty† | 0.42 |
| | (0.75) | | (0.24) |
| Salary importance | 0.97 | 5.50*** | 1.04 |
| | (0.13) | (2.63) | (0.09) |
| *N* | 130 | - | 690 |

*Note.* Exponentiated coefficients; Standard errors in parentheses; Occupational certainty are in reference to “fairly certain;” Societal contribution uses the reference category, “equally important.” † There were no MUED sample members who responded "less important” at this determinant point. * $p < .05$, ** $p < .01$, *** $p < .001$.

At the final navigational determinant point, the aspirant music educator and educator models were significant but the aspirant musician model was not. Because these models include the degree alignment variable, these results only account for individuals who were in the degree-seeking subset of the cohort.

Within the music education model ($F[7, 50] = 2.63$, $p < .05$), while high school outcome and achievement variables (GPA and music enrollment) were not significant predictors of persistence at this determinant point, variables related to future occupations were. When asked, three years after high school, about level of certainty regarding age 30

occupation intentions, those who indicated that they were “very certain” about their intended occupation were approximately thirty times as likely (OR = 30.42, $p < .05$) to have *not* changed their mind in the postsecondary years about pursuing the music teaching profession. This result is unsurprising as it demonstrates that, for aspirant music teachers, strong beliefs about occupational intention translated into persistence along the occupational pathway.

The value aspirant music educators placed on salary was also a significant predictor of persistence at this determinant point. A one point increase in the ten point salary index resulted in being five and half times more likely to stay on the music teacher pathway (OR = 5.50, $p < .001$). For context, the salary index descriptive statistics showed no significant difference between individuals on the music education pathway and the rest of the cohort at this final point. Therefore, what the result in the model indicates is that, while aspirant music educators did not value salary significantly more than those in other fields, aspirant music educators who choose stay on the pathway valued salary significantly more than those who left this pathway.

When comparing how aspirant music teachers valued salary versus the societal contribution of their occupation, those who ranked societal contribution over salary were significantly more likely to remain on the professional pathway. Those who indicated that societal contribution was more important than salary were 391.20 times less likely ($p < .01$) to have left the music teacher pathway in the three years after high school. This result suggests that the altruistic streak was strong within individuals who persisted along the music education pathway.

Pursuing a music education degree resulted in being exponentially more likely to remain interested in the music teaching profession between the end of high school and three years later (OR = 1,307.00, $p < .001$).

Degree alignment was the only significantly predictive variable in the aspirant educator model ($F[8, 110] = 8.46$, $p < .001$). Individuals who pursued a degree in education were twelve and a half times more likely (OR = 12.51, $p < .001$) to have maintained their interest in a future teaching career. Comparing the strength of degree alignment between the two fields showed no significant difference in the predictor along the two professional pathways at this point ($t = 1.49$, $p = .14$). This result suggests that pursuing either degree increased the likelihood of continuing to pursue the corresponding profession, but neither was a better predictor of professional intentions than the other.

**Navigational summary.**

As might be expected, the choices people made, values they held, and actions they took made significant contributions to their pursuit of the music, education, and music education pathways.

Aspirant educators, musicians, and music educators enrolled in high school music classes at higher than average rates with aspirant music educators having spent the most time in high school music classes. Music enrollment was a statistically significant predictor of uptake into the aspirant teacher and education degree tracks and was positively associated with uptake and persistence along both the music and music education paths.

High school academic performance was linked to pursuit of both the music education and education pathways with both groups showing higher than average GPAs. However,

during the college years, stronger academic performance resulted in a higher likelihood of leaving both of these degree tracks.

Both aspirant music educators and aspirant educators were considerably more concerned with the societal contribution their future work would make than were either musicians or the HSLS cohort overall. The societal contribution that aspirant music educators hoped to make played an important part in their persistence through the music education degree. Job availability and high earnings potential following degree attainment, on the other hand, appear to have been important factors deterring people from completing music degrees.

Salary had lower than average importance in career choice for aspirant teachers, however salary considerations were not significantly associated with career track persistence. Among aspirant music educators, however, placing higher value on future income translated to higher likelihood of persistence through the degree.

Pursuing a degree in the field was highly correlated with intending to either teach music or teach. Music degree pursuit, however, shared a weak correlation with professional music aspirations. Having high school intentions to pursue a musical profession, however, was significantly associated with music degree persistence.

Uptake, persistence, and attrition along the three pathways can be directly tied to individual beliefs, values, actions, and intentions. Success in pursuing the music, education, or music education pathways was significantly related to how people navigated their professional and educational paths.

## Chapter Conclusion

In this chapter, I demonstrated the significant influence environmental factors, demographic profile, and navigational contributions had on uptake into, persistence

along, and attrition from the music, education, and music education pathways. Individuals were afforded significant advantages and disadvantages at various points along each pathway based on the characteristics of the high school they attend and the family they were born into. People also contributed to their own persistence along these paths by the ways they chose to navigate their trajectories.

The music education pathway was both similar to and distinct from the parallel aspirational paths on either side, sharing different traits at different times with the music and education pathways. Those pursuing the music education pathway resembled other types of aspirant educators in terms of professional beliefs and values, racial/ethnic distribution, and the racial/ethnic makeup and urbanicity of their high schools. Aspirant music teachers looked more like aspirant musicians in terms of sex, socioeconomic status, and degree pursuit mobility. These comparisons point toward shared equity challenges on either side of the of the music education dichotomy.

In the final chapter, I discuss the policy, research, and pedagogical implications of these findings. With an eye toward how these data may be used to increase equity in American music education, I provide recommendations for educators, administrators, policy makers, and other stakeholders.

# Chapter 5: Discussion

In the spring of 1717, wealthy Barbadian sugar planter Stede Bonnet abandoned his plantation and future in the colonial aristocracy, invested his fortunes in a sixty-ton warship, and sought out a life of piracy. In a little more than a year's time, through a spate of strategic missteps, environmental miscalculations, and bad luck, Bonnet had relinquished command of his ship and crew to the infamous buccaneer Blackbeard, was severely wounded in battle, captured twice, and ultimately hanged for his crimes (Woodard, 2007). Stede Bonnet was not a successful pirate.

Despite the advantages his profile of wealth, social standing, and education afforded him, Bonnet's ambitions were ultimately thwarted by his literal and figurative navigational inability. The story of this failed foray into piracy should serve as a reminder that, while failure may derive from any single profile, environmental, or navigational impediment, success is often dependent on favorable attributes in all three domains.

*When are you gonna come down?*
*When are you going to land?*
*I should have stayed on the farm,*
*I should have listened to my old man.*
*(John & Taupin, 1973)*

In this final chapter, I discuss how environmental, profile, and navigational factors converge in determining pathway uptake and persistence, drawing between longitudinal determinant points and juxtaposing across models to make meaning of the many data points presented above.

## Aims and Structure of the Chapter

In this chapter, I synthesize the findings in the previous chapter into salient topics of discussion in hopes of connecting the dots among the disparate data provided in the previous chapter. I use each discussion topic as a venue to examine the interrelated nature

of these results with an eye toward how findings from this study may be used to impact meaningful change in the field. I close with the limitations of my interpretation and some final thoughts on the study I have presented.

## Discussion Topics

Through the discussion topics below, I explore how demographic conditions, value structures, and individual perceptions and actions interrelate in determining pathway outcomes. Within each discussion, I turn my attention to the implications these findings have for researchers and future music educational research agendas, policy makers and those who influence the systemic structures at play in the field, and practitioners who are best situated to impact meaningful changes. I offer charges and recommendations for each group, drawing on the data above as guiding posts for steps forward.

### Racial and ethnic bottlenecks.

Results presented in the preceding chapter point to the importance of race, ethnicity, and class as predictors and possible determinants of success on the music education pathway. Like aspirant educators, the aspiring music teacher population was likely Whiter than the rest of their cohort and came from high schools with significantly fewer racial/ethnic minority students. Further, aspirant music educators attended high schools with significantly fewer English language learners than the national average. The confluence of these points illustrates a relatively racially and ethnically homogeneous pre-service music teacher population with a deficit of experience in racially or ethnically diverse settings. In this sense, the music education pathway has not only a bottleneck that appears to impede the diversity of participants, but a bottleneck that may constrain the diversity of experiences.

This depiction of under-representation and under-experience among future music educators was well illustrated by the Black and Latino participants in DeLorenzo and Silverman's (2016) study who painted the disconnect between the experiences of their majority White undergraduate music education classmates and their own lived experiences growing up in schools and communities predominated by people of color. Like DeLorenzo and Silverman's participants' peers, the majority White aspirant music educator population in the HSLS cohort could be socially and culturally ill-equipped for the rising tide of diversity in American public schools (McFarland et al., 2019).

Considering these results in the context of urbanicity distribution may reveal additional layers of understanding to the situation. As table 4.4 shows, students who attended high schools in urban settings were less than half as common among third-year college students pursuing music education degrees as they were among the rest of the college-attending cohort. The urban experience of living in racially, ethnically, and culturally diverse locales and attending schools with higher proportions of students of color (Frankenberg, 2009) could be infrequent among pre-service music educators. Future research interacting the effects of race, ethnicity, and urbanicity on music education degree participation could be illuminative of how these variables impact the music teacher workforce.

If, as the results in this study suggest, people of color are neglecting and/or leaving pathways toward the field at disproportionate rates and aspirant music educators have less experience in racially and ethnically diverse spaces than the average student, there are roles that current music educators and music teacher educators can play in addressing these imbalances. Although the field lacks an abundance of people of color, music

teachers should insure they seek out and provide their students with positive role models and examples of musical leaders reflecting a panoply of races and ethnicities. When students of color have more opportunities to see their future selves in music educational roles, the field may present as a more inclusive reality than their daily experiences might suggest (Hamann & Walker, 1993; Karunanayake & Nauta, 2004; Sheldon & Hartley, 2012). Guest clinicians, combined ensemble performance experiences, and thoughtfully curated media examples all provide opportunities for teachers to showcase diverse musical leadership for students.

DeLorenzo and Silverman's (2016) participants—students of color in predominantly White undergraduate music teacher preparation programs—expressed unfulfilled expectations that their degree programs might mitigate the experiential divide between their White peers and inner-city realities by providing a diversity of pre-service teaching and observation experiences. Providing future music educators with experiences and tools to negotiate racially and ethnically diverse spaces should be an imperative for music teacher education programs, especially within programs predominated by racial and ethnic homogeneity. Although a racially and ethnically homogenous profile of high school appears to be providing the next generation of music teachers, future music educators can and should be prepared to effectively invest their passion and talents in *any* type of school with *any* type of population. The pre-service music teacher preference for working in schools that match their own experiences, as suggested by Kelly (2003), might be an idiosyncratic one-off if school composition was not predictive of pathway outcomes. However, as I contend from the results of my analyses above, when the teacher population is predominantly drawn from a characteristic type of school, these

preferential attitudes become a cripplingly problematic and professionally limiting character trait and should be directly addressed within music teacher preparation programs. Reflection and discussion within music education programs, tempering potential notions of "good schools" and "bad schools," could provide a venue for pre-service music teachers to explore their own implicit and explicit biases in regards to the schools they come from and the jobs they may face. Additionally, although heavily time-intensive, cultural immersion programs (Emmanuel, 2005; VanDeusen, 2017) have shown success in chipping away at culturally-limited preconceptions held among music education students.

Throughout these analyses, I chased the pernicious specter of White predominance popularly associated with the music education pathway (Bradley, 2007; Koza, 2008; Draves, 2016; Hess, 2017). In doing so, and for practical analytic reasons, as described in chapter three, I collapsed all non-White racial/ethnic categories into a singular "other." Although this approach served my analytic purposes, it should be noted that a broad interpretation of a monolithic "non-White" experience is problematic. Future research should investigate the pathway idiosyncrasies associated with being Black, Native, Latino, Asian, Pacific Islander, or any combination therein. Each racial and ethnic experience along the pathway likely has fruitful stories to tell. From a quantitative practicality standpoint, future researchers investigating these smaller subpopulations may consider pooling datasets to reach a point of inferential power.

**Socioeconomic bottlenecks.**

While racially and ethnically, the music education pathway resembled the aspirant teacher pathway, from a socioeconomic standpoint, aspirant music teachers were more

like their musician peers. These results provide credible evidence to the existence of socioeconomic bottlenecks impeding entry and persistence on both musical pathways. At the individual level, being middle class or higher and having at least one college educated parent appeared to be common requisites for making it into and through a music education degree. At the structural level, schools with high concentrations of poverty cultivated fewer aspirant music educators and provided fewer successful music degree seekers.

Music teacher educators, and schools of music could work to address low socioeconomic underrepresentation in music education programs by actively promoting and recruiting in lower resourced settings rather than drawing from the same reliably well-resourced wells. If there exists the preconception that music education, like music, is an economically unreliable professional path, music teacher educators and music educational advocates should underscore the financial viability associated with careers in teaching when making this pitch. Additionally, music teachers and college and career advisers working with lower- or under-resourced families and communities could present the music teacher pathway as a reliably stable profession in the arts.

Into and beyond the point of college matriculation, music teacher educators should remain cognizant of the high attrition risk students from lower socioeconomic brackets face in contrast to their more affluent peers. Time spent in the practice room and dollars spent on instrumental maintenance and repair do not improve undergrads' financial standing. Each external cost associated with completing the degree—including licensure exam fees (Prichard, 2018), transportation to and from observations and placements, and assembling professional attire—poses a burden to persistence for pre-service (read here

as pre-*employed*) music teachers. These costs on top of the time and resource demands required of any music degree could be enough to sink the endeavor for under-resourced students. Universities or philanthropic entities could help to offset some of the burden by providing need-based aid to cover the hidden costs of completing the degree. Prospective students and their families should seek out information on potentially hidden costs and possible supports when making college selection decisions.

> *Why did one straw break the camel's back?*
> *Here's the secret:*
> *The million other straws underneath it,*
> *It's all mathematics.*
> *(Mos Def, 1999)*

As discussed above with racial and ethnic homogeneity, a music teacher workforce with experiences limited to high-resourced musical and educational settings may be ill-equipped to function and thrive in jobs at under-resourced schools. Well-resourced schools of music—while providing ample access to educational, musical, and technological resources—may in fact hinder students' ability to develop the ingenuity and creative problem-solving skills required of future teachers who must do more with less on a daily basis. More observation and pre-service teaching time spent in low-income educational settings and more time spent simulating the practical realities of music education within communities of poverty could help pre-service teachers creatively expand their instructional toolkit and remove some of the stigma (Kelly, 2003; Boyd et al., 2005; Bruenger, 2010) associated with working in lower- or under-resourced communities.

**Music and sex.**

Men comprise a majority of the populations throughout most of the aspirant musician and aspirant music educator pathways. As demonstrated in the previous chapter, when controlling for all other demographic variables, women leave the musician pathway in high school at twice the rate of men. What is driving this sex imbalance? This outcome may point to occupational sex stereotypes among this population of adolescents with music and music education being viewed as traditionally male professions. Future investigations into the underlying causes of this disparity could inform understanding of adolescent perceptions of careers in musical fields. The higher likelihood of women to veer away from musical professions is a point secondary music teachers should be aware of. Providing additional support, when necessary, to potentially professionally-bound adolescent female musicians could bolster these young women's chances of persisting in the field.

The upshot of this outcome among aspirant music educators is that more men are entering the teaching profession, helping to offset the overwhelmingly female educator workforce. Male music teachers could be the rare point of contact between students and a male mentor figure during the school day. Roulston and Mills (2000) examined how male music teachers may represent a double-edged sword in this regard being the rare models of masculinity for students, often reinforcing rather than challenging unproductive gender stereotypes. Further research into how male music teacher populations interface in schools dominated by female teachers is certainly warranted. The robust body of research examining this phenomenon in education scholarship at large (Lahelma, 2000; Skelton,

2003; Mills, 2004; Martino, 2008) may help inform music education investigations along these lines.

**Music major mobility.**

Although not a significant predictor of degree persistence or attrition, music majors travel farther from home than the average college student. As discussed in the previous chapter and shown in table 4.4, the median distance between on-pathway music and music education majors' high schools and colleges was over thirty miles farther than it was for the rest of the college-attending cohort. A possible explanation for this increased postsecondary mobility among music majors could be the geographic draw of well-regarded private instructors. Prospective music majors, as opposed to other types of college students, may prioritize going farther to study with a specific applied studio instructor over other college or program features available at closer options. Austin, Isbell, and Russell's (2012) work highlighting the influential importance of applied studio teachers among music majors may support this theory.

Additionally, the higher socioeconomic profile of music and music education majors could also be tied to increased college mobility. As shown in table 4.12, the socioeconomic distribution on the music and music education pathways during the college determinant points is slightly skewed in the direction of the upper quintiles. More wealth and class capital could translate to a broader array of postsecondary options for this subset of the cohort bringing colleges that are beyond consideration for lower socioeconomic groups within reach of the more affluent music degree seekers. Scholarship showing the links between wealth and distance to college (Frenette, 2004; Griffith & Rothstein, 2009) supports this hypothesis. Further research investigating the

possible interrelation of socioeconomic status and music major mobility could help to explain this phenomenon.

Whatever the cause, this point may be of interest to university and school of music administrators when considering the potential recruitment reach of their programs. Whereas local recruiting may be more productive for a college of education, schools of music should consider the regional or national range of their applicant pools.

It is surprising, in light of Reininger's (2012) work showing the educator tendency to stay closer to home, that aspirant educators were not significantly different from the rest of the degree-seeking cohort in terms of distance to college. A more robust investigation focusing specifically on college mobility patterns among different types of aspirant educators could provide more information on this phase of teacher recruitment.

**Altruism.**

These results demonstrate that both aspirant music educators and aspirant educators highly valued the contribution to society that their work will make. This finding aligns with prior research in education literature (King, 1993; Shipp, 1999; Reininger, 2012) showing a strong proclivity toward social good among current and future teachers. The "call to teach," as some describe it (Bergee et al., 2001), music or otherwise, may come at a cost that only a distinct profile of individual is either willing or able to invest. Teaching anything is hard, emotionally and intellectually demanding, and often undervalued in our society. Teaching music specifically requires meeting these requisite general teaching demands in addition to achieving and maintaining a high level of musical proficiency. This double investment required of aspirant music teachers indicates a strong motivator at the end of the road. The fact that many of those who persisted on the pathway so

frequently pointed to the greater good to which they strive suggests that a commitment to altruism could be pulling many people through.

It should be noted that following one's passion to serve society in this way is a luxury not afforded to all who would take it. As previously discussed, there was a very real economic barrier to pursuing a musical pathway. A prospective music educator characteristic profile therefore could be a strong sense of altruism coupled with the means and proclivity to persist in music. Those who could not or did not access high quality pre-collegiate musical preparation may be drawn to what may be perceived as more stable or lucrative, yet still socially-minded, pursuits such as nursing, social work, or law. For well-resourced musicians without altruistic leanings, the music teaching profession may present as an incompatible value burden. For better and worse, the space where these characteristics overlap is where persistence on the music educator pathway thrived.

School counselors, college and career advisers, and music teachers should be aware of this predictably successful typology, offering students with shared passions for making music and contributing to society the prospects of a future in music education. Schools of music working to increase their community outreach and contribution footprints should look within the ranks of their music education programs, where altruism is likely abundant, for support of these initiatives. Music teacher educators could take this success indicator into account when interviewing prospective undergraduates and working with pre-service music educators.

**Music education buy-in.**

It seems logical that aspirant music educators enrolled in high school music classes at higher rates than members of the other two pathways and the rest of the cohort overall.

Aspirants invest heavily in the systems which they hope to someday be a part of. High school music students find worth and fulfillment in their secondary music experiences and commit their foreseeable futures to providing comparable experiences to others. Elpus and Abril's (2019) recent analyses using HSLS tell us that the vast majority of high school music enrollment is in band, choir, or orchestra (BCO) large ensembles. As discussed in chapter two, these large ensemble experiences often prove fertile ground for germinating music teaching occupational ambitions (Bergee et al., 2001; Madsen & Kelly, 2002; Isbell, 2008).

But what does this replication pattern mean when considered in the context of music educational reform efforts? For those pushing at the margins of what school music looks like (Williams, 2012; Tobias, 2013; Powell et al., 2015) or even calling for system-wide reconstruction (Kratus, 2007; Williams, 2011), the considerable buy-in to the BCO status quo from the future generation of music educators may not portend much will for change. Why would a system's strongest constituency seek to overhaul or even restructure the system that determined their life trajectory? Aspirant music educators are the people for whom the current system works best. Herein lies a fundamental challenge to music educational reform. Cultivating viable pathways into and through music teacher preparation programs for students who flourish outside of the dominant paradigms could help to expand the music educator profile beyond band, choir, and orchestra students. Music education reaps what it sows, and conversely, sows what it reaps. New types of music educators may help to usher in new approaches to music education.

*Plant a carrot, get a carrot,*
*Not a Brussels sprout.*
*That's why I love vegetables,*
*You know what you're about!*

*(Schmidt & Jones, 1960)*

**Music degree outcomes.**

The results of this study suggest that achieving a degree in music is poorly aligned with becoming a professional musician. As stated above, less than a quarter of current music majors intend to work in music upon completion of the degree. A primary reason for leaving the degree is concerns over the professional viability of the field. Further, the only significant navigational predictors of attrition from a music degree shown in the model were a high concern for future job availability and expectation of high earnings potential.

Put broadly, music majors have little faith in their employability in the professional field. And why shouldn't they? The large ensemble experience, central to conservatory preparation, for most, is a distant professional improbability. Professional choirs or wind ensembles are few and far between and the orchestral job market shows signs of decline (Cooper, 2016; Cooper, 2019; Midgette, 2019). Graduates of music degree programs are playing a figurative game of musical chairs. As the chairs disappear in professional orchestras and seats go unfilled in concert halls, those trained primarily in pre-industrial customs hover nervously, waiting for their music to stop.

A recent optimistic financial picture of the music industry does not match these concerns (RIAA, 2018). The emergence of multibillion dollar music streaming platforms, such as Spotify, iTunes, SoundCloud, and others have facilitated and multiplied artists' potential distribution venues around the world and ushered in a renaissance of widespread music consumption (Nusca, 2019). Yet, a majority of music majors in HSLS balked at their professional prospects in the field. Three quarters of music majors in the HSLS

cohort planned to seek work outside of the field after graduation. This incongruity wreaks of misalignment between school of music curricula and market demands.

There is, to be sure, certain cultural and societal value in maintaining Western Art Music and conservatory traditions. A foundational goal of the conservatory is to conserve. However, to use an antiquated reference, Cervantes' (2001) knight-errant was not mocked for the underlying nobility of his ideals but for the futility of his ineffective persistence. Twenty-first century music conservatories need more Sancho Panzas seeing the world for what it is and pointing the way toward rationalizing the gap between the ideal and the market viable.

However, as discussed previously, the economic benefits and market viability of a music degree could be largely irrelevant to the more financially stable populations who persist through the music pathway. If one sets aside the supposition that college degrees lead to careers, the arc of the music degree track, for many who pursue it, may be more rational than it first appears. For some, the music degree could be purely an aesthetic indulgence. A time to hone one's artistry and abilities in the intermediary between high school and real life. Descriptive statistics showed the vast majority of third year music majors listed enjoyment of the coursework as their primary reason for pursuing the degree (figure 4.7) with a paucity of respondents seeking music degrees for more directly career-related reasons. For those who pursue the degree untethered by professional outcomes or potential for financial advancement, the system, as it stands, appears to be working.

For the rest of music degree seekers who hope to someday support themselves within their discipline, current models appear to be falling short. In order for schools of music to

produce market viable graduates, these institutions will need to cultivate spaces where twenty-first century professional music skills are valued and developed. The ways music is produced and consumed in the world beyond the conservatory walls should be embraced throughout postsecondary music curricula. Incoming students should have a clear understanding of the professional potentialities that await them and graduating degree holders should see clear strategies toward the professional viability of their craft.

**The early college paradox.**

The temporal relation between the third and fourth determinant points in these analyses introduced an interesting interpretive nuance to these findings. The third determinant point is derived from the college-bound cohort's postsecondary educational ambitions immediately following high school. The fourth determinant point, on the other hand, references current college students' educational intentions at the beginning of their college careers. Rationally, pathway outcomes in these two determinant points should essentially be one in the same. However, as results throughout the study depict, there is considerable observable variance between third and fourth determinant point pathway populations.

Why do these populations differ? An estimate of nearly ten thousand people changed their minds between wanting to pursue a music degree just after high school and how they remember their initial degree intentions three years later (table 4.2). Music education, on the other hand, sees an approximate 25% influx of on-pathway degree-seekers from determinant point three to four. One way of interpreting the disparity is simple misremembering or misreporting three years later. Third year college students,

either intentionally or not, create alternate narratives of their prior selves highlighting their present values in their previous intentions.

> *But all of your letters burned up in the fire,*
> *And time is just a memory mixed with desire.*
> *(Waits, 2002)*

An alternate, but related, possible explanation of the early college paradox is the cliché wisdom of hindsight. Although the forward-looking 18-year-old viewed a music degree as their likely educational future, the retrospective 21-year-old has the advantage of seeing their own three-year trajectory played out along various educational and career intentions. It's easier to play the opening lines once you know how the rest of the song goes. The hike in aspirant music education degree-seekers echoes Allen's (2003) work showing a steady increase in vocational identity among music education students over the first three years of college. Further inquiry into educational outcomes associated with each response point could illuminate how students experience and describe their early postsecondary ambitions.

**The last horizon.**

The sixth and final determinant point in these analyses offers us the last look into what lies ahead for the cohort. Here the cohort was asked one final time what they saw as their most likely occupation, roughly ten years into the future, at age 30. Now, with most beyond their teenage years, the realities of entering the adult workforce may have been setting in. The number of aspirant professional musicians dwindled to about a third of the high school numbers, while both aspirant educator pools remained relatively stable (tables 4.1 & 4.2).

At this point, neither the environmental nor the profile models had significant predictors of persistence or attrition on any of the pathways. Among the navigational models, in contrast, there were significant predictors on both the music education and education pathways at this point. Specifically, only forward-looking variables concerning future intentions emerged as important indicators of persistence.

Why were demographic profile and high school characteristics important in shaping the aspirant population in the earlier years, but not at this final point? A partial explanation could be the elapsed time this final determination represents. Four years passed between determinant point two, when then eleventh graders were asked about their age 30 occupational intentions, and this final point. For some, these four years included working toward a college degree. For others, the time was spent in postsecondary vocational pursuits. While the high school environs may have seemed important in influencing future job prospects during the secondary years, three years outside the high school walls the influential strength of high school characteristics could have dissipated, mitigated by more recent postsecondary environmental factors.

Another piece of this puzzle could come from the mere last position of this final point. Individuals whose demographic traits would encourage their exit from the professional path could have already left with only individual intentions now deciding the future of the agglomerated pathway persisters. While race, ethnicity, sex, socioeconomic status, and parental education influenced pathway uptake and persistence in the high school years, four years later, these factors may have reached their asymptotic thresholds of influence.

The non-significance of these profile and environmental variables at the sixth determinant point could in fact underscore the importance of addressing inequities associated with these factors in the earlier high school years. If lower socioeconomic status played a significant part in deterring pursuit of the music teaching profession, three years after high school may be too late to ameliorate the situation. If not having college-educated parents kept people from wanting to become teachers, with the cohort now near the end of their undergraduate years, the damage has already been done. Women who considered a career in professional music but decided against it later in high school won't be replaced in the intervening years.

I find this final determinant point the most challenging to interpret due to the sheer number of possible angles from which to view the implications of the preceding tributary determinant points. The potential ripple effects of observed and unobserved factors from prior models raise many questions. Why was degree pursuit associated with demographic variables and highly aligned with professional pursuit, yet the college years seem not to have impacted the final demography of the pathway populations? What role did population replacement by like traits play leading up to these final results? How do those who bypassed college, circumventing postsecondary bottlenecks, influence these outcomes? I'll stop short here of chasing the rabbit down any number of speculative holes and turn to my concluding thoughts.

## Limitations of this Chapter

Although, in this chapter, I draw together what I see as some of the principal results yielded from these analyses, like any single perspective, the story I chose to tell is incomplete (Adichie, 2009). The questions I ask, the topics on which I focus, and the implications I make are biased by my own values, experiences, environments, and my

own winding pathway up to this point. These data and these findings offer many stories beyond the ones I have told. I hope that this project and the results herein may serve as a series of channel markers, guiding future investigators on their own inquisitive journeys.

## Conclusions

So, who makes it through? Simply put, people with an abundance of advantageous traits, resources, and characteristics persisted on these pathways, while those lacking these attributes or evincing aberrant qualities often did not. Demographic situation, environmental conditions, and individual actions each push and pull on the human experience. Through this study, I have endeavored to describe the ways these factors influence the music education pathway and similarly act on the closely-related aspirational paths on either side across the scope of the high school and collegiate years. As these results support, demographic and environmental forces, conditions outside of the individual's sphere of influence, shaped the populations who pursued and persisted in these fields. As the results also support, individual actions, efforts, intentions, and values had significant associations with who made it through the music, education, and music education pathways. No single perspective provides a full account of persistence or attrition factors as pathways and the equity of these pathways are best understood from a multiple perspectives approach. I turn now to charges for the actors and stakeholders who have hands in influencing uptake and persistence trends and the equity of these trends.

**Charges to the field.**

*We are the music makers,*
*And we are the dreamers of dreams,*
*Wandering by lone sea-breakers,*
*And sitting by desolate streams;*
*World-losers and world-forsakers,*
*On whom the pale moon gleams:*
*Yet we are the movers and shakers*
*Of the world for ever, it seems.*
*(O'Shaughnessy, 1874)*

High school experiences and high school conditions were important determinants in these students' future aspirations. I charge current and future music teachers to fully embrace their charter to provide high quality music education to *all* students regardless of school condition or student population, to appreciate the uneven terrain school conditions and individual demographics create for students and recognize how these factors can play into students' educational and professional ambitions. Those pursuing the pathway should be well aware of potentially inherent biases in the path they traverse. To school administrators and education policy makers I issue the perennial charge to rectify inter-school resource disparities associated with school demographics.

As dictated by their demographic profiles, prior environmental conditions, and navigational inclinations, prospective undergraduate music education students come to college with varying amounts of social capital, institutional knowledge, professional value alignment, and sociocultural baggage. It is the music teacher educator's charge to recognize and understand how these factors create bridges and barriers, bottlenecks and boosts to and through the degree program. I charge school of music and university administrators with rationalizing the cultural and market goals of their music degree programs, accepting both as essential facets.

**Final thoughts.**

*Great hail! we cry to the comers*
*From the dazzling unknown shore;*
*Bring us hither your sun and your summers;*
*And renew our world as of yore;*
*You shall teach us your song's new numbers,*
*And things that we dreamed not before:*
*Yea, in spite of a dreamer who slumbers,*
*And a singer who sings no more.*
*(O'Shaughnessy, 1874)*

As I write these final lines, we are ten years beyond the point that 25,000 ninth graders initially peered into the future and speculated on their own outcomes. By now, many of these individuals have cleared undergraduate and graduate degree work, some became teachers, some are professional musicians, and some are now music teachers. Many more followed different pathways to other educational and professional pursuits. As we face the dawn of the next generation of ninth grade aspirant musicians, educators, and music educators now embarking on their own pathways, we as teachers, teacher educators, administrators, policy makers, gatekeepers, and advocates should remember the lessons learned from the HSLS cohort and embrace the roles we play in shaping these young peoples' futures. When dreams are dictated by demographics or sociostructural forces, the equity of the human experience is impeded. I charge each of us who may play a role in this next generation's dreams, ambitions, and pathways to interrogate the equity and impact of our actions as these young captains navigate their life courses. Eastward aiming, dreaming awaits.

# Appendix A

Music keywords used for aspirant musician search

**General:**
music
rockstar
rock star
recording artist
orchestra
symphony
band
concert
composer
conductor
choir
chorus
choral
opera
jazz

**Wind Instruments:**
piccolo
picolo
flute
flautist
flutist
oboe
oboist
clarinet
saxophone
sax
bassoon
bassoon
trumpet
horn
frenchhorn
trombone
trombonist
euphonium
barritonist
baritonist
tuba
tubist

**Percussion:**
percussion
drummer
drums
timpani
marimba
marrimba
marimbist
vibes
vibraphone
steeldrum
steelpan
steelband
steel band
conga
congero
bongo
timbales
timbalero

**Strings:**
violin
viola
violist
cello
cellist
bass
guitar
harp
ukulele
banjo
mandolin

**Misc. Instruments:**
bagpipe
bag pipe
harmonica
luthier
sound design
sounddesign

**Keyboard:**
piano
pianist
accompanist
keyboard
synthesizer
organ
organist
accordion
acordion
accordian
acordian

**Vocal:**
sing
singer
song
soprano
sopranno
saprano
alto
tenor
barritone
baritone
basso
a cappella
acappella
acapela
acappela
acapella
singger

**Hip-hop:**
DJ
disc jockey
deejay
rapper
rap
hiphop
hip-hop
hip hop
beats
beatbox
beat box

**Genres:**
bluegrass
blue grass
polka
blues
techno
EDM
broadway
r and b
r&b
r & b
rnb
r n b
rock n roll
rock and roll
rock 'n roll
rock 'n' roll
rock & roll
mariachi
marriachi
gospel
sound engineer
death metal
deathmetal
movie score
film score
filmscore
soundtrack
reggae
ska
dubstep
dub step
grunge
punk
alternative rock
neo-soul
neo soul
indie rock
indy rock
cumbia
salsa
jpop
j-pop
j pop
kpop
k-pop
k pop

# Appendix B

Table B.1
CIP codes and titles of degrees used to identify teacher education degree-seekers

| CIP | Title | CIP | Title | CIP | Title |
|---|---|---|---|---|---|
| 13.1201 | Adult and Continuing Education and Teaching | 13.1006 | Education/Teaching of Individuals with Mental Retardation | 13.1209 | Kindergarten/Preschool Education and Teaching |
| 13.1301 | Agricultural Teacher Education | 13.1007 | Education/Teaching of Individuals with Multiple Disabilities | 13.1333 | Latin Teacher Education |
| 13.1302 | Art Teacher Education | 13.1008 | Education/Teaching of Individuals with Orthopedic and Other Physical Health Impairments | 13.1311 | Mathematics Teacher Education |
| 13.0201 | Bilingual and Multilingual Education | 13.1011 | Education/Teaching of Individuals with Specific Learning Disabilities | 13.1207 | Montessori Teacher Education |
| 13.0299 | Bilingual, Multilingual, and Multicultural Education, Other | 13.1012 | Education/Teaching of Individuals with Speech or Language Impairments | 13.0202 | Multicultural Education |
| 13.1322 | Biology Teacher Education | 13.1016 | Education/Teaching of Individuals with Traumatic Brain Injuries | 13.1314 | Physical Education Teaching and Coaching |
| 13.1303 | Business Teacher Education | 13.1009 | Education/Teaching of Individuals with Vision Impairments Including Blindness | 13.1329 | Physics Teacher Education |
| 13.1323 | Chemistry Teacher Education | 13.1004 | Education/Teaching of the Gifted and Talented | 13.1335 | Psychology Teacher Education |
| 13.1321 | Computer Teacher Education | 13.1202 | Elementary Education and Teaching | 13.1315 | Reading Teacher Education |
| 13.1324 | Drama and Dance Teacher Education | 13.1305 | English/Language Arts Teacher Education | 13.1310 | Sales and Marketing Operations/Marketing and Distribution Teacher Education |
| 13.1304 | Driver and Safety Teacher Education | 13.1338 | Environmental Education | 13.1316 | Science Teacher Education/General Science Teacher Education |
| 13.1210 | Early Childhood Education and Teaching | 13.1308 | Family and Consumer Sciences/Home Economics Teacher Education | 13.1205 | Secondary Education and Teaching |
| 13.1337 | Earth Science Teacher Education | 13.1306 | Foreign Language Teacher Education | 13.1317 | Social Science Teacher Education |
| 13.0101 | Education, General | 13.1325 | French Language Teacher Education | 13.1318 | Social Studies Teacher Education |
| 13.9999 | Education, Other | 13.1332 | Geography Teacher Education | 13.1330 | Spanish Language Teacher Education |
| 13.1015 | Education/Teaching of Individuals in Early Childhood Special Education Programs | 13.1326 | German Language Teacher Education | 13.1001 | Special Education and Teaching, General |
| 13.1017 | Education/Teaching of Individuals in Elementary Special Education Programs | 31.0501 | Health and Physical Education/Fitness, General | 13.1099 | Special Education and Teaching, Other |
| 13.1018 | Education/Teaching of Individuals in Junior High/Middle School Special Education Programs | 31.0599 | Health and Physical Education/Fitness, Other | 13.1331 | Speech Teacher Education |
| 13.1019 | Education/Teaching of Individuals in Secondary Special Education Programs | 13.1327 | Health Occupations Teacher Education | 13.1299 | Teacher Education and Professional Development, Specific Levels and Methods, Other |
| 13.1014 | Education/Teaching of Individuals Who are Developmentally Delayed | 13.1307 | Health Teacher Education | 13.1399 | Teacher Education and Professional Development, Specific Subject Areas, Other |
| 13.1013 | Education/Teaching of Individuals with Autism | 13.1328 | History Teacher Education | | |
| 13.1005 | Education/Teaching of Individuals with Emotional Disturbances | 13.0203 | Indian/Native American Education | | |
| 13.1003 | Education/Teaching of Individuals with Hearing Impairments Including Deafness | 13.1203 | Junior High/Intermediate/Middle School Education and Teaching | | |

Table B.2
CIP codes and titles of degrees used to identify music degree-seekers

| **CIP** | **Title** |
|---|---|
| 50.0906 | Conducting |
| 50.0910 | Jazz/Jazz Studies |
| 50.0902 | Music History, Literature, and Theory |
| 50.1003 | Music Management and Merchandising |
| 50.1003 | Music Management |
| 50.0912 | Music Pedagogy |
| 50.0903 | Music Performance, General |
| 50.0913 | Music Technology |
| 50.0904 | Music Theory and Music Composition |
| 51.2305 | Music Therapy/Therapist |
| 50.0901 | Music, General |
| 50.0999 | Music, Other |
| 36.0115 | Music |
| 47.0404 | Musical Instrument Fabrication and Repair |
| 50.0509 | Musical Theatre |
| 50.0905 | Musicology and Ethnomusiclology |
| 50.0916 | Percussion Instruments |
| 10.0203 | Recording Arts Technology/Technician |
| 39.0501 | Religious/Sacred Music |
| 50.0906 | Conducting |
| *Note.* Excludes Music Education (13.1312) | |

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