An Exploration of Stereotype Threat

in Collegiate Music Programs

by

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ABSTRACT

This document explores the presence of stereotype threat among college students training for careers in music. Beginning in the 1990s, an effort led by Claude M. Steele (social psychologist and professor emeritus at Stanford University) identified stereotype threat as an attribute to the underperformance of minority groups. Continued research has mainly focused on stereotype threat within the following contexts: female performance within science, technology, engineering, and mathematical (STEM) fields, African American performance on standardized tests, and European American performance in athletics. This document contains two pilot studies that strive to apply current stereotype threat research to the field of music education and music performance in order to ask the following questions: Does stereotype threat impact the education of underrepresented collegiate music students? Does stereotype threat heighten gender awareness of musicians when they enter the typical auditioning environment? The two pilot studies consist of the following: (1) a survey intended to analyze the possible impact of stereotype threat on music students' interaction with their colleagues and music instructors and (2) a quantitative study that explores the presence of stereotype threat (among musicians) through the use of a word-fragment completion task administered immediately before a mock audition.

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CHAPTER 1: INTRODUCTION

What is Stereotype Threat?

The term "stereotype threat" was first used by Claude M. Steele and Joshua Aronson in a study published by the *Journal of Personality and Social Psychology* in 1995. This article, titled "Stereotype Threat and the Intellectual Test Performance of African Americans," stated "stereotype threat is being at risk of confirming, as self-characteristic, a negative stereotype about one's group."[1] Following this publication, over 300 empirical studies investigating the various mechanisms, vulnerable populations, and consequences of stereotype threat have been published in peer-reviewed journals, further expanding the breadth and core understanding of stereotype threat.[2]

Focusing on the consequences of stereotype threat, the pioneering study by Steele and Aronson demonstrated that when race was emphasized, black students' performance on standardized tests diminished at a quicker rate than white students' performance.[3] Since the publication of this study, further research suggests that stereotype threat has the potential to affect any individual facing a situation that invokes an expected performance outcome based on already existing stereotypes. Furthermore, stereotype threat has been shown to affect an individual's career and college major choices (limiting minority

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[1] Claude M. Steele and Joshua Aronson, "Stereotype Threat and the Intellectual Test Performance of African Americans," *Journal of Personality and Social Psychology* 69/5 (2009): 797.

[2] "What is Stereotype Threat?" ReducingStereotypeThreat.org, accessed 9 January 2017, http://www.reducingstereotypethreat.org/definition.html.

[3] Steele and Aronson, "Stereotype Threat and the Intellectual Test Performance," 797-811.

participation in certain career fields), and stereotype threat has been linked to self-handicapping habits that negatively affect stereotyped individuals.

In recent years, stereotype threat researchers have branched out from studying the consequences of stereotype threat, and have published studies exploring the situations that activate stereotype threat and methods to reduce the impact of stereotype threat. However, the presence of stereotype threat in the fields of music education/music performance has not yet been researched.

Fundamental Principles of Stereotype Threat

Although stereotype threat research has not been immune to criticism, hundreds of empirical studies have led scholars to draw the following conclusions (among others) about stereotype threat:

1. Stereotype threat may affect the performance of any individual "for whom the situation invokes a stereotype-based expectation of poor performance."[4]
2. Stereotyped individuals who demonstrate high ability in a field are often the most vulnerable to stereotype threat.[5]
3. Stereotype threat may impact the career choices of individuals by redirecting the aspirations of vulnerable populations.[6]

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[4] "What is Stereotype Threat?"

[5] Catherine Good, Joshua Aronson, Jayne Ann Harder, "Problems in the Pipeline: Stereotype Threat and Women's Achievement in High-Level Math Courses," *Journal of Applied Developmental Psychology* 29/1 (2008): 17-28.

[6] Rosalind Chait Barnett, Jennifer Steele, and Jacquelyn B. James, "Learning in a Man's World: Examining the Perceptions of Undergraduate Women in Male-Dominated Academic Areas," *Psychology of Women Quarterly* 26/1 (2002), 46-50.

4. Stereotype threat has been linked to a variety of mechanisms including anxiety, lowered performance expectations, physiological arousal, reduced effort (or excessive effort), reduced self-control, reduced working memory capacity, and reduced creativity.[7]
5. Stereotype threat may be alleviated through a variety of methods including the reframing of tasks,[8] increased engagement with role models,[9] and self-affirmation practices.[10]

With the challenges of music performance in mind, these principles could be applied in order to explore the low levels of diversity in American music programs.

The Importance of Diversity in Collegiate Music Programs

In 2011, the United States reached a demographic milestone when for the first time in history, more minority babies were born than white babies over the course of one year.[11] However, if one was to attend a band or orchestra concert at a regional university,

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[7] "What are the Mechanisms Behind Stereotype Threat?" ReducingStereotypeThreat.org, accessed 28 January 2017, http://www.reducing stereotypethreat.org/definition.html.

[8] Steele and Aronson, "Stereotype Threat and the Intellectual Test Performance of African Americans," 797-811.

[9] Hart Blanton, Jennifer Crocker, Dale T. Miller, "The Effects of In-Group versus Out-Group Social Comparison on Self-Esteem in the Context of a Negative Stereotype," *Journal of Experimental Social Psychology* 36/5 (2000): 519-530.

[10] Andy Martens, Michael Johns, and Jeff Greenberg, "Combating Stereotype Threat: The Effect of Self-Affirmation on Women's Intellectual Performance," *Journal of Experimental Social Psychology* 42/2 (2006): 236-243.

[11] Sabrina Tavernise, "Whites Account for Under Half of Births in U.S.," *The New York Times*, May 17, 2012, accessed 18 January 2017, http://www.nytimes.com/ 2012/05/17/us/whites-account-for-under-half-of-births-in-us.html.

college, or conservatory, the demographics of the performers on stage would sharply contrast the demographics of the general population in the United States. While previous studies have shown that minorities have demonstrated clear interest in participating in performance ensembles, collegiate music programs have failed to fulfill those interests.[12] In his article "Minority Students and Faculty in Higher Education," Allen Clements points to research by Lemuel Berry Jr. to explain the failure of collegiate music programs to recruit minorities.[13] In 1990, Berry Jr. identified the following five challenges to minority recruitment by collegiate music programs:

1. The failure of institutions to offset the lack of college preparation. Some music programs that exist have the stigma of being remedial; therefore, students fail to request help.
2. Many music programs lack a "critical mass" of minority students and faculty who can act as role models and make new students feel at home.
3. White [faculty and students] sometimes expect minority students to behave according to stereotypes.
4. Black music students often complain that professors treat them like remedial students.
5. Many minority students who are first-generation collegians fail to get enough emotional or financial support from home.[14]

Although these challenges were identified over two decades ago, collegiate music programs still struggle to overcome these issues when recruiting minority students. Berry

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[12] Linda M. Walker and Donald L. Hamann, "Minority Recruitment: The Relationship between High School Students' Perceptions about Music Participation and Recruitment Strategies," *Bulletin of the Council for Research in Music Education* 124 (1995): 24-38.

[13] Allen Clements, "Minority Students and Faculty in Higher Music Education," *Music Educators Journal* 95/3 (2009): 53-56.

[14] Lemuel Berry Jr., "Strategies for the Recruitment and Retention of Minority Music Students," in *Proceedings of the 65th Annual Meeting of the National Association of Schools of Music* (Reston, VA: National Association of Schools of Music, 1990), 112.

Jr.'s third point speaks directly to the focus of this document—stereotype threat—as he claims that stereotypes present a direct challenge to the recruitment of minority students.

More recently (2014), the College Music Society published a list of recommendations compiled by the Task Force on the Undergraduate Music Major (TFUMM) titled "Transforming Music Study from its Foundations: A Manifesto for Progressive Change in the Undergraduate Preparation of Music Majors." After observing many differences between "music in the real world" and "music in the academy," the TFUMM identified three key pillars that would be necessary to "ensure the relevance, quality, and rigor of the undergraduate music curriculum" in American colleges, universities, and conservatories.[15] These three key pillars were creativity, diversity, and integration. Furthermore, the task force concluded that "without such fundamental change, traditional music departments, schools, and conservatories may face declining enrollments as sophisticated high school students seek music career development outside the often rarefied environments and curricula that have been characteristic since music first became a major in America's colleges and universities."[16] While this manifesto predominately focuses on curriculum changes that would likely benefit undergraduate music students, the manifesto also implies that America's collegiate music programs would be stronger if they continued to strive for more creative, diverse, and integrated

[15] Patricia Shehan Campbell, Ed Sarath, Juan Chattah, Leehiggins, Victoria Lindsay Lievine, David Rudge, and Timothy Rice, "Transforming Music Study from its Foundations: A Manifesto for Progressive Change in the Undergraduate Preparation of Music Majors," *College Music Society* (2014): 2.

[16] Ibid.

student bodies. While other fields of education have increased their efforts to support diversity and integration, music programs have, in comparison, been slow to act.[17] Yet, as collegiate music administrators now face the likelihood of declining enrollments, diversity and multiculturalism efforts have received increased attention by researchers.

Purpose of the Study

As minority enrollment in collegiate music programs continues to increase, stereotype threat research, along with innovative ways to combat stereotype threat, may help ensure the success of minority music students. This study is not meant to uncover any new knowledge about the mechanisms or impact of stereotype threat. Rather, this study is meant to transfer current knowledge about stereotype threat to the field of music. In doing so, this study strives to fulfill the following purposes:

1. Explore whether or not student engagement and student study/practice habits vary depending on an individual's demographics.
2. Explore whether the gender awareness of musicians changes when they enter high-stress audition scenarios.
3. Raise awareness among music administrators and music faculty about the potential impact of stereotype threat on both student and professional musicians.

[17] Deborah Bradley, "The Sounds of Silence: Talking Race in Music Education," *Action, Criticism, and Theory for Music Education* 6/4 (2007): 132.

4. Encourage further research exploring the impact of stereotype threat on minority music students and discuss obstacles to applying stereotype threat research models to music education and music performance.

CHAPTER 2: LITERATURE REVIEW

This overview discusses current and relevant research that relates to stereotypes—more specifically, stereotypes that shape general perspectives of Western art music and the musicians that participate within this musical realm. The identification of these stereotypes is the first step towards studying the impact of stereotype threat on professional and student musicians. While stereotypes are ever-changing and vary by geographical region, they are also the multifaceted products of pervasive social and cultural traditions that date back centuries. The histories of these social and cultural traditions provide uncountable paths for discussing the many stereotypes of music; however, this literature review will focus on current demographics that suggest the presence of stereotype threat, the gendered perceptions of individual instruments, and current perceptions of different musical genres.

Demographics of Professional & Student Musicians

An analysis of demographic data collected from professional and student musicians in the U.S. tends to support the theory that stereotype threat impacts the level of participation of specific groups—these stereotypes assume that classical music is an elite art-form for white, male performers. Although the New York Philharmonic hired its first black musician over fifty years ago, the percentage of minority members in American orchestras still remains minute, showing little progress over the years. In 2012, the NAFME article "Missing Faces from the Orchestra: An Issue of Social Justice?" by Lisa C. DeLorenzo published demographic results of four major U.S. orchestras collected from email correspondence with the different orchestras' personnel managers. According to DeLorenzo, the correspondence revealed that of the musicians that make up the New

York Philharmonic, the Atlanta Symphony Orchestra, the New Jersey Symphony Orchestra, and the Philadelphia Orchestra, less than two percent were black or Latino.[18]

A similar statistic was reported in a 2014 article "Strength in Diversity," published by *The Strad.* In this article, Vivien Schweitzer reported the results of a nationwide review of American orchestras that revealed black and Latino membership at 4.2 percent, with minority makeup of executive director positions at less than 0.5 percent.[19] This article also speaks to the "active prejudice" that was faced by minority musicians during the 1960s, a time when many orchestras were first desegregated. Schweitzer concludes her article by arguing for increased efforts to diversify American orchestras, claiming that diversified orchestras will lead to more supportive and diversified audiences.

While less severe, minority participation in American high school and collegiate music programs also remains low. Using data from a 2004 follow-up wave of the Educational Longitudinal Study of 2002, Kenneth Elpus and Carlos R. Abril published a demographic profile of high school music ensemble students in the U.S. The 2011 article published by the *Journal of Research in Music Education* found that the following groups of students were significantly *underrepresented* in American music programs: male students, English language learners, Hispanic students, children of parents holding a high

[18] Lisa C. DeLorenzo, "Missing Faces from the Orchestra: An Issue of Social Justice," *Music Educators Journal* 98/4 (2012), 39.

[19] Vivien Schweitzer, "Strength in Diversity," *The Strad* 125 (November 2014): 46.

school diploma or less, and students in the lowest socioeconomic status.[20] Similarly, Elpus and Abril reported that the following groups were significantly *overrepresented* in American music programs: students from higher socioeconomic status, native English speakers, students in the highest standardized test score quartiles, and children of parents holding advanced postsecondary degrees.[21]

In 2009, Allen Clements published an article in the *Music Educators Journal* discussing three main topics central to minority participation in music education. Clements identified these three main topics as "recruitment (undergraduate, graduate, and faculty/administration), access, and alternative curricula/outreach programs."[22] In 1995, Linda M. Walker and Donald L. Hamann revealed issues with the recruitment of minority students in their article titled "Minority Recruitment: The Relationship between High School Students' Perceptions about Music Participation and Recruitment Strategies." This study explored the perceptions of high school students surrounding "the importance of academic and sociocultural factors to their participation in music at the college level and the relationship of these factors to the college and university recruitment process."[23] The subjects of the study were 774 students enrolled in inner city high school music classes. The results of this study demonstrate that while a large proportion of black high

[20] Kenneth Elpus and Carlos R. Abril, "High School Music Ensemble Students in the United States: A Demographic Profile," *Journal of Research in Music Education* 59/2 (2011): 128.

[21] Ibid.

[22] Clements, "Minority Students and Faculty in Higher Music Education," 53.

[23] Walker and Hamann, "Minority Recruitment," 24.

school students expressed interest in participating in collegiate music classes (82 percent), they were much less likely than their white peers to consider majoring in music (34 percent compared to 59 percent of white students surveyed).[24] Furthermore, Walker and Hamann found that black students were more likely to consider social factors in relation to their decision to take music classes in college.[25]

Similar demographical investigations have also been conducted to explore the current gender makeup of U.S. music programs. While gender stereotypes have historically portrayed women as having less musical talent than their male counterparts, evidence demonstrates that tides have begun to change in American schools and professional orchestras. During the 1970s and 1980s, as orchestral audition procedures were re-evaluated in the U.S. and the use of screens during auditions became standard practice, the ethnic and gender makeup of orchestras began to change. Claudia Goldin and Cecilia Rouse have published in *The American Economic Review* an extensive report on the impact of blind auditions on female musicians. According to Goldin and Rouse, the participation of women in major U.S. orchestras has increased drastically over the last sixty years, reporting that the proportion of females in the New York Philharmonic increased from almost non-existent in 1940 to 35 percent in 2000.[26] Furthermore, with data compiled from audition results spanning back about forty years from 1995, Goldin

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[24] Ibid., 28.

[25] Ibid., 34-35.

[26] Claudia Goldin and Cecilia Rouse, "Orchestrating Impartiality: The Impact of 'Blind' Auditions on Female Musicians," *The American Economic Review* 90/4 (2000): 717-718.

and Rouse found that women were five percentage points more likely to be hired than men (in auditions without semifinal rounds), as long as one factor was present—a *completely* blind audition process.[27] Along with other supporting data, Goldin and Rouse concluded that blind auditions have led to a "democratization" of U.S. orchestras, even though "many music directors, in charge of hiring new musicians, publicly disclosed their belief that female players had lower musical talent."[28]

In 2015, Kenneth Elpus published recent participation rates of males and females in high school music programs with the article "National Estimates of Male and Female Enrollment in American High School Choirs, Bands and Orchestras." Elpus points out that in addition to his research, the following areas have received increased scrutiny within the "larger sphere" of gender research in music education: 1) the gender stereotyping of musical instruments, 2) the underrepresentation of females among the ranks of instrumental conductors and instrumental music educators, and 3) the participation or lack of participation of males in singing.[29] Elpus' study analyzed data collected from the High School Transcript Studies (conducted by the National Centre for Education Statistics) between 1982 and 2009. Elpus concluded that (for the time period studied) "females were significantly overrepresented in all three traditional US high

[27] Ibid., 734. It is also important to note that, while this data was reported, it was not found to be statistically significant.

[28] Ibid., 737.

[29] Kenneth Elpus, "National Estimates of Male and Female Enrolment in American High School Choirs, Bands and Orchestras," *Music Education Research* 17/1 (2015): 89.

school music ensemble areas: choir, band and orchestra."[30] In addition, Elpus found that the highest gender discrepancy existed within choral programs, where Elpus reported only 30 percent male participation.[31] With supporting demographic data, Elpus claims that the current emphasis on ensemble music making leads to "gender sorting of females into music at the high school level."[32] Furthermore, these results have led Elpus to question the "dominance" of male instrumental music educators in the U.S.[33]

Musical Instruments & Gender Associations

The stereotypes that surround art music are not only evident in the demographics of participating musicians, but are also evident in the individual histories of the musical instruments. This area of research has had many recent contributors, over which Fina M. F. Wych published a literature review in a 2012 *NAFME Update*. She explains that researchers have explored a variety of angles, including gender factors that influence the instrument selection of young musicians, the gender stratification of performing ensembles (by instrument), audience perception of performing musicians in relation to their gender and instrument, and theories that attempt to understand instrument based gender associations.[34] At the conclusion of the literature review Wych stated, "It is clear through this body of research that gender-based instrument stereotypes not only exist but

[30] Ibid., 88.

[31] Ibid.

[32] Ibid.

[33] Ibid.

[34] Gina M. F. Wych, "Gender and Instrument Associations, Stereotypes, and Stratification: A Literature Review," *NAFME Update* 30/2 (2012): 23.

also are affecting the choices beginning band students make and the experiences they encounter throughout their time in public school music."[35]

In 2002, Anna C. Harrison and Susan A. O'Neill published the results from a quantitative study that support Wych's conclusion. Harrison and O'Neill recorded the reactions of 192 children to "hypothetical peers playing gender-consistent or gender-inconsistent instruments."[36] The findings revealed that the children preferred students playing gender-consistent instruments over students playing gender-inconsistent instruments. Further testing found that children thought they would be more liked by their peers if they played a gender-consistent instrument, and they thought they would be disliked if they played a gender-inconsistent instrument.[37]

Finally, a 2009 report by Hal Abeles claims that there has been little change in gender associations with musical instruments and that young music students are still playing the same kinds of instruments that they did in the 1970s and 1990s.[38] This claim contradicts earlier studies that suggested gender associations with musical instruments were beginning to lessen.[39]

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[35] Ibid., 30.

[36] Anna C. Harrison and Susan A. O'Neill, "The Development of Children's Gendered Knowledge and Preferences in Music," *Feminism & Psychology* 12/2 (2002): 147.

[37] Ibid., 148.

[38] Hal Abeles, "Are Musical Instrument Gender Associations Changing?" *Journal of Research in Music Education* 57/2 (2009): 135.

[39] Judith K. Delzell and David A. Leppla, "Gender Association of Musical Instruments and Preferences of Fourth-Grade Students for Selected Instruments," *Journal of Research in Music Education* 40/2 (1992): 93-103.

Stereotypes Surrounding Musical Genres

In 2009, Peter J. Rentfrow, Jennifer A. McDonald, and Julian A. Oldmeadow assessed stereotypes about music fans of specific genres. The research team observed that the participants surveyed were in high agreement about the stereotypes of classical music fans.[40] The majority of study participants (British young adults) agreed that the prototypical classical music fan is white and of upper-middle or upper socioeconomic status.[41] While this study mainly focuses on the fans of classical music and not on the music performers themselves, Rentfrow et al. claim that music-genre stereotypes are at least partially a result of music performers who "embody and reinforce the image associated with a particular style of music, and as such communicate information about the characteristics of the fans of the music."[42] The content and validity of music-genre stereotypes was also examined by Rentfrow and Samuel D. Gosling in 2007. Rentfrow and Gosling found similar evidence, suggesting that there are "robust and clearly defined stereotypes about the fans of various music genres."[43]

Research presented in 2016 by Adam J. Lonsdale and Adrian C. North reveals that "an individual is more likely to prefer a particular musical style if he/she is similar,

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[40] Peter J. Rentfrow, Jennifer A. McDonald, and Julian A. Oldmeadow, "You Are What You Listen To: Young People's Stereotypes about Music Fans," *Group Process & Intergroup Relations* 12/3 (2009): 334.

[41] Ibid., 336-337.

[42] Ibid., 339.

[43] Peter J. Rentfrow, and Samuel D. Gosling, "The Content and Validity of Music-Genre Stereotypes Among College Students," *Psychology of Music* 35/2 (2007): 306.

or at least perceive themselves to be similar, to its stereotypical fans."[44] This suggests that music-genre stereotypes could effectively dissuade minority participation in art music if individuals do not perceive themselves to be similar to the stereotypical fan.

Summary and Conclusions

Although the research discussed in this literature review does not specifically mention stereotype threat and does not attempt to prove the presence of stereotype threat in music education or music performance, it does provide evidence of an environment in which stereotype threat could diminish minority performance. As stated earlier, one of the theoretical principles of stereotype threat is that stereotype threat can impact the performance of any individual "for whom the situation invokes a stereotype-based expectation of poor performance."[45] The research discussed provides evidence of "stereotype-based expectations" that could be formed from demographical observations of current musicians, historical gender associations of musical instruments, or even music-genre stereotypes.

[44] Adam J. Lonsdale and Adrian C. North, "Self-to-Stereotype Matching and Musical Taste: Is There a Link Between Self-to-Stereotype Similarity and Self-Rated Music-Genre Preferences?" *Psychology of Music* (2016): 11.

[45] "What is Stereotype Threat?"

CHAPTER 3: OBSTACLES TO APPLYING CURRENT RESEARCH MODELS TO MUSIC PERFORMANCE

In order to identify situations in which stereotype threat could affect the performance of a musician, it seems reasonable to adapt research models previously used to explore stereotype activation and stereotype threat in fields outside of music. However, due to the subjective nature of a musical performance, there are various issues with appropriating other research models. For example, many of the existing research models rely on performance outcomes as indicators of underachievement, outcomes not easily quantified in music. This chapter will discuss challenges that arise when attempting to adapt current research models for use in the identification of stereotype threat in music performance.

Outcome Based Models

Early stereotype threat research compared the performance outcomes of individuals when they were exposed to different pre-test situations. These studies often assigned participants to diagnostic groups, where the possibility of stereotype threat was heightened. The performance results of these participants were then compared to the performance results of undiagnostic and/or control groups, where participants were tested in more neutral situations. While the performance measures varied (from academic exams to athletic events), these early studies compared performance outcomes on tasks that returned objective data—tasks that presented black and white, numerical measures of performance and had been commonly used as barriers to entrance within the respective field.

Steele and Aronson's 1995 monumental investigation of stereotype threat and African American intellectual test performance asked participants to complete a thirty-minute test comprised of questions from the verbal Graduate Record Examination (GRE). While the instructions were manipulated for the different groups, the primary dependent measure was "participants' performance on the test adjusted for the influence of individual differences in skill level (operationalized as participants' verbal SAT scores)."[46] A study implementing a similar research model was published four years later (1999) by researchers at the University of Arizona and Princeton University. With this study, the researchers manipulated participants' racial awareness before they completed an athletic task. The primary dependent measure was "the number of strokes required to complete the 10-hole golf course."[47]

While it is possible to manipulate participant instructions (or change a participant's identity awareness) before a music performance task, researchers face challenges when attempting to provide dependent measures for the outcome of the task. Subjective assessments of a musician's technical abilities are possible, but assessment of musical proficiency is far from objective. A musical performance includes many variables that are difficult to control and could be detrimental to the collection of reliable data. Comparing performances on different musical instruments decreasing the reliability of the data. How do you compare the performance of a string bassist and a flutist? You

[46] Steele and Aronson, "Stereotype Threat and the Intellectual Test Performance of African Americans," 799.

[47] Jeff Stone, Christian I. Lynch, Mike Sjomeling, and John M. Darley, "Stereotype Threat Effects on Black and White Athletic Performance," *Journal of Personality and Social Psychology* 77/6 (1999): 1216.

would not ask them both to play the same musical excerpts, so how would the difficulty levels of the different excerpts be controlled? Furthermore, how would a researcher adjust for individual differences in skill level? Steele and Aronson used previous standardized testing results to adjust their data. However, data is not typically collected by colleges or universities that could account for individual differences in skill level. While pretesting would be an option, this would require additional time and funding. These are some aspects that present obstacles to adapting outcome based research models previously employed by stereotype threat researchers.

Physiological Based Models

As an alternative to comparing performance outcome measures, social scientists have designed models that measure the byproducts of stereotype threat, including physiological stress responses. The investigation into physiological stress among minority groups began in an effort to understand the mechanisms of stereotype threat—to explain *why* increased stereotype awareness can lead to diminished performance results. This research has pointed to working memory—"memory that involves storing, focusing attention on, and manipulating information for a relatively short period of time."[48] Multiple researchers have indicated that changes in working memory may explain underachievement on standardized tests among certain racial and gender groups.[49]

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[48] "Working Memory," *Merriam-Webster Dictionary,* https://www.merriam-webster.com/medical/working%20memory.

[49] Toni Schmader, Michael Johns, and Chad Forbes, "An Integrated Process Model of Stereotype Threat Effects on Performance," *Psychological Review* 115/2 (2008): 340.

Furthermore, cognitive psychologists have extensively studied working memory, and several psychophysiological measures of mental workload have been developed. One of these measures, cardiovascular activity, is fairly easy to record and has been commonly used by stereotype threat researchers to measure changes in mental workload. According to a review released in 2000 by Jochen Fahrenberg and Cornelis J. E. Wientjes, cardiovascular measurement was ranked as the most suitable index for use in applied settings investigating working memory due to its reliability, ease of use, and unobtrusiveness.[50]

Jean-Claude Corizet et al. used such cardiovascular measures in a 2004 study that determined that stereotype threat has the ability to undermine performance on intellectual tasks by "triggering a disruptive mental load."[51] According to Corizet et al., "there is now accumulating evidence showing that heart rate usually increases during mental tasks, whereas Heart Rate Variability decreases consistently with mental load."[52] Relying on this psychophysiological principle, Corizet et al. measured participants heart rates while they completed an adaption of the Raven Advanced Progressive Matrices Test. In accord with previous research, members of the negatively stereotyped groups (in relation to intellectual performance) scored lower on the test than other participants. More

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[50] Jochen Fahrenberg and Cornelis J. E. Wientjes, "Recording Methods in Applied Environments," in *Engineering Psychophysiology*, ed. Richard W. Backs and Boucsein Wolfram (Mahwah, NJ: Lawrence Erlbaum, 2000): 111-136.

[51] Jean-Claude Croizet, Gérard Després, Marie-Eve Gauzins, Pascal Huguet, Jacques-Philippe Leyens, and Alain Méot, "Stereotype Threat Undermines Intellectual Performance by Triggering a Disruptive Mental Load," *PSPB* 30/6 (2004): 721.

[52] Ibid.

importantly, the study found that participants who were vulnerable to stereotype threat demonstrated Heart Rate Variability results that suggested a "disruptive mental load."[53] Corizet et al. claim their results "indicate that group differences in cognitive ability scores can reflect different situational burdens and not necessarily actual differences in cognitive ability."[54] This research model suggests that when performance outcomes may not be an accurate measure of stereotype threat, Heart Rate Variability could serve as a substitute measure.

While Heart Rate Variability may be a more objective measure than music performance outcomes (and could be helpful in identifying the presence of stereotype threat), it does come with its own challenges in application, especially if the researcher is attempting to measure Heart Rate Variability of musicians during live performance. While measuring Heart Rate Variability during live performance, it would be difficult to control for the many factors that may affect a musician's cardiovascular system. For instrumentalists, these factors could even include minute differences between their instruments. For wind musicians in particular, slight differences in mouthpiece dimensions (or the combination of mouthpiece, reed, and instrument) could change the amount of physical exertion required of the musician. Furthermore, these variations may not be consistent throughout performance and could be dependent on a handful of musical factors such as the pitch range of the excerpt, the tempo, phrase length, and the musician's expressive choices. Due to these issues, Heart Rate Variability and other

[53] Ibid.

[54] Ibid.

physiological measures may not be reliable indicators of the presence of stereotype threat during live performance.

Conversely, physiological vigilance measures may be ideal in identifying situational cues that lead to identity threat—if measured while musicians are not in direct performance situations. In 2007, Mary C. Murphy, Claude M. Steele, and James J. Gross published a study that measured physiological vigilance of male and female participants while they were being exposed to either gender un-balanced or gender balanced videos. They used the following measures of physiological vigilance: cardiac interbeat interval, finger pulse amplitude, finger and ear pulse transit time, finger temperature, and skin conductance level.[55] According to the researchers, "simple-effects tests revealed that women who watched the gender un-balanced video showed greater increases in sympathetic activation of the cardiovascular system than did women who watched the gender balanced video."[56] While this study focused on female math, science, and engineering students as they observed video footage of a conference in their field, this research model could be replicated with music majors. Cardiovascular changes while observing video footage of identity-consistent or identity-inconsistent musicians could be an identifier of stereotype threat, even if they were induced by artificial situational cues.

[55] Mary C. Murphy, Claude M. Steele, and James J. Gross, "Signaling Threat: How Situational Cues Affect Women in Math, Science, and Engineering Settings," *Association for Psychological Science* 18/10 (2007): 881.

[56] Ibid., 882.

Other Models

In addition to the research models previously mentioned, a range of other models prove useful in this line of study. These models include the use of word-fragment completion tasks, which have been used by researchers as a tool to "measure the cognitive activation of constructs that are either recently primed or self-generated,"[57] and qualitative based studies that rely on self-reporting by participants. As stereotype threat research progresses, it should be possible to create a model for identifying musicians at a high risk for stereotype threat—similar to the Social Identities and Attitudes Scale (SIAS) created by Katherine Picho and Scott W. Brown. While SIAS was developed specifically for the identification of vulnerable individuals, it was developed to evaluate stereotype threat in STEM fields and is currently limited in its application to mathematical performance.[58] Yet, according to Picho and Brown, "the instrument is adaptable and can be used to capture stereotype threat across different domains."[59] The adaptation of such an assessment would be a major step in the process of learning how to reduce the negative impacts of stereotypes on musicians. Furthermore, this could potentially be a valuable tool for music educators to increase and sustain diversity within their music programs.

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[57] Steele and Aronson, "Stereotype Threat and the Intellectual Test Performance of African Americans," 803.

[58] Katherine Picho and Scott W. Brown, "Can Stereotype Threat Be Measured? A Validation of the Social Identities and Attitudes Scale (SIAS)," *Journal of Advanced Academics* 22/3 (2011): 406.

[59] Ibid.

CHAPTER 4: PILOT STUDY 1

Basis for Research

This survey, an action research undertaking, was based on previous research by Philip Uri Treisman that intended to measure student engagement in relation to their academic performance. In 1992 Treisman published a report analyzing the daily lives of collegiate, minority mathematics students.[60] For this study, Treisman followed calculus students to observe their lives outside of class. Using an anthropological research model, Treisman observed differences in how black, white, and Asian students studied. Treisman observed that Asian students were more likely than white students to study in groups, while black students mainly worked independently. Treisman observed that Asian students blended their social lives with their academic lives, while black students spent long hours studying alone. Furthermore, Treisman observed that without peers to discuss mathematical concepts, the black students were more likely to get hung up on difficult ideas without knowing that their peers were also facing similar difficulties. Treisman concluded that this lack of knowledge (of their peers' hardships) contributed to increased anxiety among black students, poor performance in math classes, and played a role in discouraging black students from further studies in higher level math courses.

With this knowledge, Treisman created workshops for teaching upper level mathematics to minority students (focusing on both black and female student populations who may have been negatively affected by stereotypes). According to Steele, these

[60] Philip Uri Treisman, "Studying Students Studying Calculus: A Look at the Lives of Minority Mathematics Students in College," *College Mathematics Journal* 23/5: 362-367.

workshops focused on "immersion in challenging math, and, perhaps above all, on studying in groups—a technique that his success has helped to disseminate throughout the nation."[61] These workshops were highly successful, earning Treisman the MacArthur "genius" award.[62] This hypothesis—that working collaboratively may improve the performance of negatively stereotyped populations—serves as the basis for this survey. Just as Treisman observed the study habits of mathematics students, this survey intends to collect data about the study and practice habits of collegiate music students.

Methodology

The instrument used to gather data for this study was a survey questionnaire: **Survey: An Exploration of Stereotype Threat in Collegiate Music Education**.[63] Section One of the survey contained nine questions regarding the participants' demographics (age, race, gender, nationality, and self-defined family income level), current degree track, primary instrument/voice, and grade point average (GPA). Section Two contained seven questions intended to gauge participants' practice/study habits and engagement with their peers and instructors. Section Three contained four questions intended to collect data to gauge how willing participants would be to ask for help (from their peers and their instructors) if they were struggling with an academic or performance issue.

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[61] Claude M. Steele, *Whistling Vivaldi and Other Clues to How Stereotypes Affect Us* (New York: Norton, 2010), 99-100.

[62] Ibid., 99.

[63] Survey questions are located in APPENDIX A.

For easy online access, the questionnaire was designed and distributed through SurveyMonkey using an email list. The questionnaire was emailed to all students enrolled in music courses at Arizona State University during the Fall semester of 2016. The questionnaire was designed to be easily read and completed, and called for a minimal amount of direct input by the respondent. Most of the questions could be answered by checking the appropriate responses from a set of possible choices. For questions that required numerical data responses, participants were given two possible data entry methods: a moveable icon dragged along a sliding scale or a textbox to manually type the data. The questionnaire was designed to be completed in approximately twelve to fifteen minutes. No incentive was given in return for participation, and the web link directing participants to the questionnaire was open for forty-five days.

Sample Population

Part One of the survey questionnaire contained nine questions regarding the participants' demographics, current degree track, primary instrument/voice, and GPA. These data will be reported relative to the following degree categories: 1) undergraduate students in music degree tracks, 2) graduate students in music degree tracks, and 3) students in degree tracks outside the School of Music, but enrolled in music courses at the time of the survey. Tables 1-4 represent the sample population of the study divided by degree track, race, gender, and family income level. Family income levels were not numerically defined on the survey, because data collected was intended to represent the individual's perceptions of their socioeconomic standing which may differ from their actual financial situation.

Table 1. Sample Population – Pilot Study 1

SAMPLE	Undergraduate		Graduate		Non-Music	
	(N)	(%)	(N)	(%)	(N)	(%)
103	34	(33)	24	(23.3)	45	(43.7)

n = 103

Undergraduate: Undergraduate students in music degree tracks
Graduate: Graduate students in music degree tracks
Non-Music: Students in degree tracks outside of the School of Music

Table 2. Gender – Pilot Study 1

RESPONSES	Undergraduate		Graduate		Non-Music	
	(N)	(%)	(N)	(%)	(N)	(%)
Female	25	(73.5)	9	(37.5)	25	(55.6)
Male	9	(26.5)	15	(62.5)	18	(40)
Transgender Male	0	(0)	0	(0)	1	(2.2)
Non-Conforming	0	(0)	0	(0)	1	(2.2)
TOTALS	34	(100)	24	(100)	45	(100)

Table 3. Race – Pilot Study 1

RESPONSES	Undergraduate		Graduate		Non-Music	
	(N)	(%)	(N)	(%)	(N)	(%)
White	27	(79.4)	20	(83.3)	27	(60)
Asian	3	(8.82)	4	(16.7)	8	(17.8)
Black	1	(2.94)	0	(0)	1	(2.2)
Hispanic	2	(5.9)	0	(0)	6	(13.3)
Two or More Races	1	(2.94)	0	(0)	3	(6.7)
TOTALS	34	(100)	24	(100)	45	(100)

Table 4. Family Income Level – Pilot Study 1

RESPONSES	Undergraduate		Graduate		Non-Music	
	(N)	(%)	(N)	(%)	(N)	(%)
Low	2	(5.9)	6	(25)	3	(6.7)
Middle	32	(94.1)	17	(70.8)	37	(82.2)
High	0	(0)	1	(4.2)	5	(11.1)
TOTALS	34	(100)	24	(100)	45	(100)

Results

Although the sample size was not large enough (or diverse enough) to compare data responses from different racial groups, it was possible to compare the responses of graduate students from different family income levels. Overall, both undergraduate and graduate students who reported membership in the low family income class were on average less likely to engage and interact with their peers and instructors when compared to their colleagues of the middle family income class. Specific ranges for the different family income levels were not specified on the survey questionnaire because stereotype threat is dependent on an individual's identity perception rather than their actual situation. Because this was a pilot study (intended to evaluate feasibility and identify trends), the sample size was, in most cases, not large enough to make statistically significant comparisons. However, there appears to be a trend that further research may be able to corroborate: music students of low socioeconomic status are less likely to spend time with their colleagues in social environments, less likely to engage in electronic communication with their colleagues and instructors, and less likely to attend their instructors' office hours.

At the graduate level two important comparisons were statistically significant: (Scenario 1) graduate students of the lower family income class reported that they were on average less likely to ask an instructor or teaching assistant for help if they were struggling with a performance aspect pertaining to their voice or instrument (x^2, $p = .012$) and (Scenario 2) graduate students of the lower family income class reported that they were on average less likely to ask an instructor or teaching assistant for help if they were struggling to learn the material for one of their music courses (x^2, $p = .041$). While

the mean differences between the income classes for these scenarios may not seem extreme on the surface, students with lower responses to the first scenario (willingness to ask for help with a performance aspect) were more likely to have a lower overall GPA ($r_\tau = 2.74$, $p = .013$). Kendall's tau non-parametric correlation was used because the data set was small, did not reflect a normal distribution, and had a large set of tied ranks. This correlation was based on responses by all students majoring or minoring in music, not just graduate students.

Furthermore, even though the graduate students of the low family income class reported that they were less likely to ask for help from their instructors, they reported spending *similar* amounts of time per week practicing their primary instrument. This suggests that these students are not lacking in discipline or dedication, but may be avoiding help from instructors in an attempt to avoid confirming negative stereotypes. Table 5 contains the average responses of the graduate students by income level for the following categories: (1) the two scenarios discussed above, (2) average hours spent practicing per week, and (3) mean GPA. (The statistically significant comparisons are highlighted in bold.) Along with the survey questions, complete data reports (divided by income level) are provided in APPENIX A.

Table 5. Graduate Student Averages by Family Income Level – Pilot Study 1

MEANS	Low Income	Middle Income	(High Income)*
Scenario 1	**8.67**	**9.76**	(10.00)
Scenario 2	**6.50**	**8.41**	(10.00)
Hours Practiced	17.00	16.88	(20.00)
GPA	3.74	3.92	(4.00)

*(Only one graduate student reported high family income class, so data should be approached with caution.)

Summary and Discussion

The trends uncovered by this survey questionnaire are consistent with the fundamental principles of stereotype threat. However, in order to provide solid evidence for the presence of socioeconomic based stereotype threat in the field of music, this study would need to expand in both sample size and geographical scope. Ideally, the sample size would expand by a factor of six and include students from multiple institutions across the U.S. Because data were collected only from Arizona State University, the trends observed in this study may not be representative of all music students or all music institutions across the U.S. Collecting data from multiple institutions will help control for differing educational approaches and differing educational environments, just as collecting data from multiple geographical regions will help control for social patterns that may vary by region. With an increased sample size, it may also be possible to make conclusions based on race and gender. Overall, trends implicated by this study do support the hypothesis that music students who report low family income class are vulnerable to

stereotype threat. However, further research would be necessary to evaluate the possibility of alternative explanations that could lead to similar results.

CHAPTER 5: PILOT STUDY 2

Introduction

Although stereotype threat research in other fields points to the high probability that musicians are also vulnerable, researchers have not yet positively identified the impact of stereotype threat within the field of music. The present pilot study aims to evaluate the feasibility of a research design which was developed to explore vulnerabilities among female musicians. Second, this pilot study aims to collect preliminary evidence that may suggest the presence of stereotype threat. Historically, women have been stereotyped as having less musical ability. Thus, in line with the fundamental principles of stereotype threat, it is reasonable to assume that the situational stressors involved with musical performances/auditions may lead to stereotype threat among female musicians.

The research design for this pilot study was adapted from the third section of Steele and Aronson's study "Stereotype Threat and the Intellectual Test Performance of African Americans," which used a word-fragment completion task to compare the racial awareness of black and white students prior to completing a task intended to evaluate "higher verbal reasoning."[64] Instead of measuring indicators of racial awareness, this pilot study looks at the gender awareness of musicians prior to their completion of a mock audition.

[64] Steele and Aronson, "Stereotype Threat and the Intellectual Test Performance of African Americans," 803.

Methodology

Overview

This experiment took the form of a 2 X 3 design in which the self-reported gender of the participants was crossed with diagnostic, nondiagnostic, and control conditions. For this pilot study, 32 participants (22 females and 10 males) were randomly assigned to one of the three conditions. Participants were recruited from the pool of music students at Arizona State University who met the following conditions: 1) the individual participated in one of the instrumental large ensembles on campus and 2) the individual reported English fluency. Each participant completed a word-fragment completion task under a controlled environment. This environment was manipulated, depending on the assigned condition, and the results of the word-fragment completion tasks were analyzed in order to uncover varying levels of gender awareness. This research model was designed to test the following hypotheses: 1) female musicians in high stress performance scenarios experience increased gender awareness when compared to females in low stress performance scenarios (presumably as a result of stereotype threat), 2) the gender awareness of female musicians during performance is higher than male musicians in similar scenarios, and 3) the reframing of performance scenarios has the potential to reduce gender awareness and thus vulnerability to stereotype threat.

Procedure

Participants in the diagnostic and nondiagnostic groups arrived to the study expecting to play a mock audition, but they were unaware of the selected excerpts. After completing the consent process, participants were seated behind a screen for what they

believed would be a blind mock audition. The diagnostic group was shown a rubric outlining exactly how they would be evaluated during the mock audition. Similar to a realistic audition scenario, the participants were allowed time to warm up. However, prior to beginning the mock audition, the participants were asked to complete a word-fragment completion task. Previously, the participants were told that the study was examining the relationship between verbal processing and music literacy. Further written instructions were provided to the participants; however, these instructions were manipulated depending on the participant's assigned group. The instructions were designed with the intent to activate or deactivate stereotype threat. To differentiate the conditions, the following written instructions were provided and read aloud to the participants:

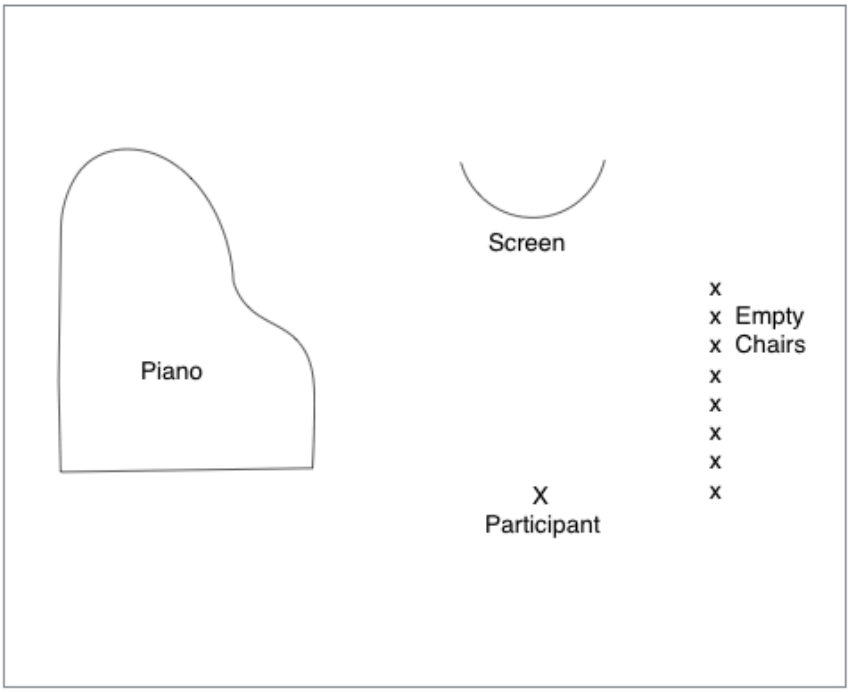
> Diagnostic*: "*Because we want an accurate measure of your ability in these domains, we ask you to try as hard as you can to perform well on these tasks. Treat the performance element as an audition, as it will be graded in a similar manner. At the end of the study, we can give you feedback which may be helpful by pointing out your strengths and weaknesses."
>
> Nondiagnostic*:* "Even though we are not evaluating your ability on these tasks, we ask you to try as hard as you can to perform well on these tasks. If you want to know more about your verbal processing score in relation to your audition, we can give you feedback at the end of the study." (These instructions were intended to deactivate stereotype threat.)

The diagnostic instructions and the performance evaluation rubric shown to participants in the diagnostic group were intended to heighten the participants' stress levels—similar to the stress levels experienced during a "real life" audition or performance. The

nondiagnostic instructions were intended to lessen the level of stress, and the nondiagnostic participants were not shown a rubric detailing how their mock audition would be evaluated. Participants in the control group were asked to complete the word-fragment completion task in a neutral space (not a music performance space), and these participants were not asked to perform a mock audition.

In an attempt to be consistent with "real life" scenarios, the participants were not specifically primed for stereotype threat or made directly aware of current stereotypes that surround the field of music. Throughout the process of the study, the participants interacted with a female researcher, and efforts were taken to limit other external gender cues during the study. (For example, participants were consistently provided yellow pencils for use on the word-fragment completion task—a color that is not typically associated with a specific gender.) The diagnostic and undiagnostic groups completed the study in a rehearsal space inside the music building that was routinely used for music rehearsals by chamber ensembles. Hypothetically, even something as simple as the environment can evoke stereotype threat responses. Thus, the space chosen for the study had characteristics that would be typical for the music profession: high ceilings, a grand piano, acoustic panels, and rows of empty chairs that simulated an audience. Figure 1 is a rough diagram of how the room was organized for the diagnostic and undiagnostic groups.

Figure 1. Arrangement of Room – Diagnostic & Undiagnostic Groups



This study used deception—participants were unaware of the actual intentions of the researcher until the conclusion of the study. Initially, the participants were told that the study was investigating connections between music literacy and verbal processing. After finishing the word-fragment completion task, the diagnostic and undiagnostic participants were asked to perform a few excerpts taken from a list that they had performed earlier that academic year for large ensemble auditions. These performances were not evaluated. Rather, this element was included in the study in order to portray a realistic auditioning environment for participants who may have been waiting outside the room to participate next. The entire process took about twenty minutes for each participant, and at the completion of the study, the participants were debriefed and compensated with a $10 Amazon gift card.

Word-Fragment Completion Task

The word-fragment completion task consisted of sixty-one word-fragments, with missing letters specified by blank spaces (e.g., W_ _ D).[65] Each word had a variety of possible solutions. While the majority of these words were considered "filler words," fourteen were pre-identified "critical words" that could have been completed in a way that reflected gender. The participants were instructed to complete the task quickly, completing the word-fragments with the first word that came to mind. Past researchers have used the word-fragment completion task to identify the activation of stereotypic constructs. According to Gilbert and Hixon, "the word-fragment completion test has been shown to be extremely sensitive to the activation of constructs that have been either recently encountered (Tulving, Schacter, & Stark, 1982) or self-generated (Bassili & Smith, 1986)."[66] Word-fragment completion tasks have recently been used by researchers in a variety of fields. For example, in 2010 Marc A. Sestir and Bruce D. Bartholow used a word-fragment completion task to investigate the effects of violent video games on the aggressiveness of video game players,[67] and in 2011 a team of researchers used a word-

[65] "Critical words" for the word-fragment completion task are located in APPENDIX B.

[66] Daniel T. Gilbert, and J. Gregory Hixon, "The Trouble of Thinking: Activation and Application of Stereotypic Beliefs," *Journal of Personality and Social Psychology* 60/4 (1991), 510.

[67] Marc A. Sestir and Bruce D. Bartholow, "Violent and Nonviolent Video Games Produce Opposing Effects on Aggressive and Prosocial Outcomes," *Journal of Experimental Social Psychology* 46/6 (2010): 934-942.

fragment completion task to investigate the effects of social exclusion on an individual's positive mental outlook.[68]

The Generation of the "Critical Words"

Students in a cross-listed music history course (consisting of about twenty music students, both undergraduate and graduate students) were asked to "list all the words that come quickly to mind when you think about the female gender." Next, they then repeated the same task and constructed words related to the male gender. The words independently identified by at least 33% of all participants were considered potential candidates for "critical words" in the word-fragment completion test. Next, the words identified by the music history class were constructed into word-fragments and tested for the possibility of multiple solutions. If the word-fragment allowed for multiple solutions, it was included in the word-fragment completion task. Seven female oriented word-fragments and seven male oriented word-fragments were included in the word-fragment completion task. The stereotypic words were considered "critical words," and numerous additional "filler words" were randomly intermixed. A list of the "critical words" is available in APPENDIX B.

Results

While this is only a pilot study and did not include enough participants (especially male participants) to report reliable results, the data collected encourages further research and further testing of the hypotheses. Among female participants, the average number of

[68] C. Nathan DeWall, Jean M. Twenge, Sander L. Koole, Roy F. Baumeister, and Allissa Marquez, "Automatic Emotion Regulation After Social Exclusion: Tuning to Positivity," *Emotion* 11/3 (2011): 623-636.

gender positive solutions (or word-fragment completions that matched the pre-identified "critical words") was the highest for the participants of the diagnostic group (1.71) and lowest for the participants of the nondiagnostic group (.43). The control group showed little difference from the diagnostic group (1.63). Analysis of the male participants' word-fragment completion tasks showed smaller differences between the three groups. Tables 6 and 7 present the average number of gender positive solutions among participants. In addition to the average total number of gender positive solutions, the data are divided based on solutions that reflect the same-sex or the opposite-sex of the participant.

Table 6. Average Gender Positive Solutions, Female Participants – Pilot Study 2

MEANS	Control (8)*	Diagnostic (7)	Nondiagnostic (7)
Female Participants: Same-Sex Gender Positive Solutions	1.63	1.14	.43
Female Participants: Opposite-Sex Gender Positive Solutions	0.00	.57	0.00
Female Participants: Total Gender Positive Solutions	1.63	1.71	.43

*The number in ( ) indicates the number of participants in each group.

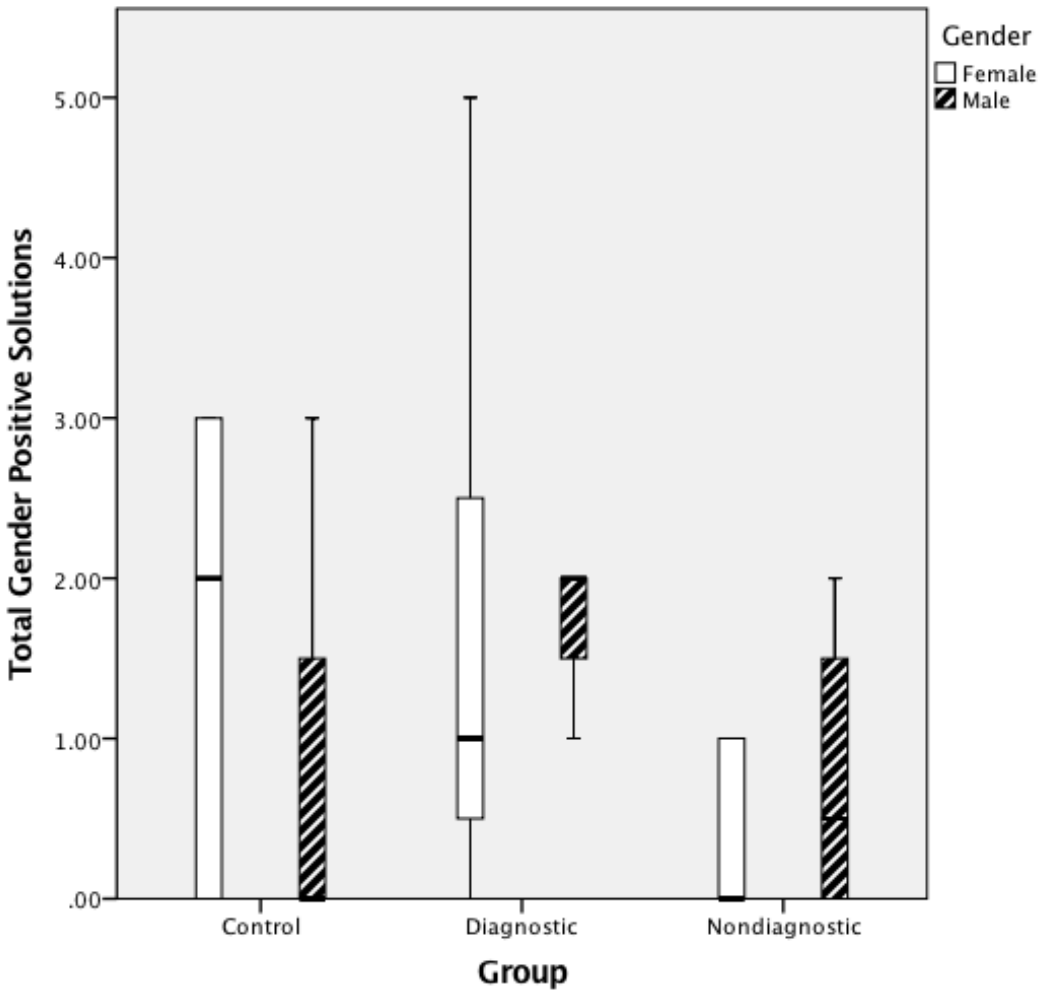
Table 7. Average Gender Positive Solutions, Male Participants – Pilot Study 2

MEANS	Control (3)*	Diagnostic (3)	Nondiagnostic (4)
Male Participants: Same-Sex Gender Positive Solutions	.33	.67	.25
Male Participants: Opposite-Sex Gender Positive Solutions	.67	1.00	.50
Male Participants: Total Gender Positive Solutions	1.00	1.67	.75

*The number in ( ) indicates the number of participants in each group.

Figure 2, a boxplot of the data, shows the ranges of gender positive solutions among the different groups. It is important to note that while a population may be vulnerable to stereotype threat, not every individual in that population will experience the effects. Thus, populations vulnerable to stereotype threat may demonstrate wider ranges of gender positive solutions. The data spread for female participants in the nondiagnostic group decreased, and outliers were eliminated. This suggests that by reframing the performance scenario, the effects of stereotype threat may have lessened among participants who otherwise would have been the most vulnerable.

Figure 2. Boxplot: Total Gender Positive Solutions



Confirmation of these trends by a larger study would not only support the idea that female musicians are vulnerable to stereotype threat, but that the reframing of performance scenarios (realized in this study by the different instructions provided to the diagnostic and nondiagnostic groups) has the potential to lessen the consequences of stereotype threat. This is consistent with research in other fields that has shown that the

reframing of a task through the nullification of the assumed diagnosticity of the task reduces vulnerability to stereotype threat.[69]

Furthermore, the data show heightened gender awareness for females in *both* the control and the diagnostic groups. This suggests that female musicians may be continuously vulnerable to stereotype threat while in music education environments, even when they are not actively performing. It is possible that stereotype threat may be activated by minor events, such as physically entering the music building on campus.

Research Concerns

In order to confirm these trends, a larger sample would be required and the word-fragment completion task would need to be extended with the addition of more "critical words." The addition of more "critical words" would limit the impact of possible ceiling or floor effects on the overall data and strengthen any trends noticed by the different groups. Another issue of concern is the variety of instruments represented in the study. Because each musical instrument carries with it separate and distinct stereotypes, broad generalizations resulting from this study may not apply to female musicians of all instruments. For example, female brass instrumentalists may be more vulnerable to stereotype threat because they are less represented in professional ensembles. On the other hand, female woodwind instrumentalists may be less vulnerable to stereotype threat. Previous research has shown that the effects of stereotype threat is diminished or

[69] Steele and Aronson, "Stereotype Threat and the Intellectual Test Performance of African Americans," 797-811.

removed when minority populations reach "critical mass" within a given field or situation.[70]

Improvements to this pilot study could be made by modifying the musical instruments represented in the experiment. This could be done by including only performers of a single instrument (for a more specific analysis) or by broadening and evening out the distribution of instruments represented (for a better generalized analysis). However, such adaptions to the study design present recruiting challenges that may be difficult to overcome. The following table displays the instruments represented in this pilot study, which, due to the fact that the researcher is a clarinetist, consisted of a large proportion of clarinetists.

[70] Charlotte R. Pennington and Derek Heim, "Creating a Critical Mass Eliminates the Effects of Stereotype Threat on Women's Mathematical Performance," *British Journal of Educational Psychology* 86/3 (2016): 353-368.

Table 8. Instrumentation of Participants – Pilot Study 2

INSTRUMENT	Control F (M)*	Diagnostic F (M)	Nondiagnostic F (M)
Clarinet	4 (2)	4 (2)	6 (1)
Flute	1 (0)	1 (0)	1 (1)
Trumpet	1 (0)	0 (0)	0 (0)
Euphonium	0 (0)	1 (0)	0 (0)
Horn	0 (0)	0 (0)	0 (1)
Bassoon	1 (0)	0 (0)	0 (0)
Tuba	0 (1)	0 (0)	0 (1)
Trombone	0 (0)	0 (1)	0 (0)
Oboe	0 (0)	1 (0)	0 (0)
Violin	1 (0)	0 (0)	0 (0)

*F indicates female participants; M indicates male participants

CHAPTER 6: CONCLUSIONS & RECOMMENDATIONS

Call to Action

Even though there may not be adequate empirical evidence (at this time) to support the presence of stereotype threat in the music programs of American colleges and universities, research investigating minority underperformance in other fields suggests that musicians of underrepresented groups would be similarly challenged by issues of identity. The underrepresentation of minority groups is not something that higher education administrators alone will be able to overcome—music training at a young age is vital to a musician's continued success at advanced levels. Yet, college and university faculty members could make improvements by being aware of proven methods to reduce stereotype threat and by continuing to undercover scenarios (specific to the lives of musicians) that may lead to underperformance.

Methods for Reducing the Impact of Stereotype Threat

Anxiety is often pointed to as a mechanism of stereotype threat that leads to underperformance among stereotyped groups.[71] Because musicians are commonly evaluated in public forums, this anxiety may be present during performance scenarios. In addition to reducing underperformance and disengagement, reducing stereotype threat may result in lower levels of anxiety among vulnerable musicians. The following methods have been identified by researchers as ways to combat stereotype threat: 1) reframing the task, 2) deemphasizing social identities, 3) encouraging self-affirmation, 4)

[71] "What Are the Mechanisms Behind Stereotype Threat?" ReducingStereotypeThreat.org, accessed 28 February 2017, http://www.reducing stereotypethreat.org/mechanisms.html.

emphasizing high standards (with assurances about capability to meet them), 5) providing role models, 6) providing external attributions for difficulty, and 7) emphasizing an incremental view of intelligence.[72] Although these are generalized recommendations made by researchers studying stereotype threat in other fields, it is possible to adapt these ideas for use within music education.

While needing confirmation, the data presented in Chapter 5: Pilot Study 2 are consistent with the idea that the reframing of tasks may be an effective method to reduce the impact of stereotype threat among musicians. Musicians often approach auditions as evaluations that are focused on their weaknesses as performers. However, studio instructors may successfully reduce vulnerabilities to stereotype threat by molding their students' attitudes about auditions and other performance evaluations. Students who approach performance evaluations as an opportunity to display their strengths may prove less vulnerable to stereotype driven anxiety.

Self-affirmation habits may also be reinforced by music instructors and could be incorporated into instructors' pedagogical practices. Music students are often asked by instructors to evaluate their own performances, and motivated students are more likely to turn their attention to their weaknesses while giving little consideration to their strengths. Encouraging students to identify their strengths may not only serve a pedagogical purpose, but may also reinforce self-affirmation habits in a way that could reduce their vulnerability to stereotype threat.

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[72] "What Can Be Done to Reduce Stereotype Threat?" ReducingStereotypeThreat.org, accessed 28 February 2017, http://www.reducing stereotypethreat.org/reduce.html.

In addition to self-affirmation, an emphasis on high standards (established through mentor/mentee relationships) has been a proven method for combating stereotype threat. Yet, high standards must be balanced with the assurance that students can reach those standards if they take the right steps—"constructive feedback appears most effective when it communicates high standards for performance but also assurances that the student is capable of meeting those high standards."[73] High standards combat stereotype threat by reducing perceived evaluator bias and by communicating to students that they will not be judged based on pervasive stereotypes.[74]

Increasing student exposure to role models is another proven method for combatting stereotype threat. While a single music instructor cannot embody all of the different identities of their students, music instructors may work to provide role models for students of underrepresented groups. Individual instructors may make improvements within this realm by evaluating a variety of aspects from their students' perspectives. For example, instructors should evaluate the diversity of artists and composers that their students come into contact with on a daily basis through study, performance, and in-person experiences. The engagement of a diverse group of guest/visiting artists would help provide role models for students that struggle to identify with the music faculty on their campus.

Within general society, a musician's success or failure is often attributed to "natural talent" (or a lack thereof). This attitude would be an example of an internal

[73] Ibid.

[74] Ibid.

attribution. Stereotyped individuals are more likely to look for internal attributions to explain their academic or career difficulties. Thus, the effects of stereotype threat may be reduced by encouraging students to recognize external attributions for their difficulties. For example, when students receive unfavorable performance evaluations, instructors should help students understand the external aspects that may have led to those results. Possible external attributions could include a lack of committed practice time, less than efficient practice habits, or just a lack of overall experience. When having discussions with students, instructors should lead by example and avoid discussing musical abilities as "natural talent."

Finally, the emphasis on incremental views of intelligence has shown positive results in reducing the impact of stereotype threat. This idea alludes to the *incremental theory of intelligence*, which suggests that intelligence is malleable and may be increased through hard work. According to the American psychologist Carol S. Dweck, "students who have an 'incremental' theory of intelligence are not threatened by failure. Because they believe that their intelligence can be increased through effort and persistence, these students set mastery goals and seek academic challenges that they believe will help them to grow intellectually."[75] Theoretically, these implications would also be advantageous for musicians who possess incremental views of musical ability. Thus, in order to reduce the implications of stereotype threat, instructors should place a higher emphasis on "incremental" as opposed to "entity" views.

[75] "Carol S. Dweck," Human Intelligence: Historical Influences, Current Controversies, and Teaching Resources, accessed 5 March 2017, http://www.intelltheory.com/dweck.shtml.

Conclusion

This is just a starting point for stereotype threat research within the field of music. While there are many different routes for continued research, cross-disciplinary collaborations between music researchers and social phycologists may prove the most reliable route forward. Furthermore, collaborations with researchers who study performance anxiety might be beneficial in uncovering connections between stereotype threat and the crippling anxiety reported by many musicians. Overall, continued stereotype threat research may help reveal methods to reduce the disengagement and altered professional aspirations seen among vulnerable populations. In doing so, stereotype threat researchers may ultimately help diversify the ranks of American musicians and consequently, the audiences who listen to their music.

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APPENDIX A

PILOT STUDY 1: SURVEY QUESTIONS & DATA RESULTS

Survey: Part Two Questions

1. Approximately how many hours do you practice your primary instrument (or sing) during the typical academic week (not including regularly scheduled class time)?
2. During a typical academic week, approximately how many hours do you spend with other music students outside of normally scheduled class time? (Consider even the most mundane tasks, such as walking to class or eating in the cafeteria.)
3. During a typical academic week, approximately how many hours do you spend practicing an instrument (or singing) with other music students outside of class?
4. During a typical academic week, approximately how many hours do you spend studying with other music students (outside of regularly scheduled class time)?
5. During a typical academic week, on how many occasions do you communicate electronically with other music students? (Be sure to include text messages, phone correspondence, emails, and social media platforms.)
6. During a typical academic week, on how many occasions do you communicate electronically with your music instructors or teaching assistants?
7. During a typical academic ***semester***, approximately how many times do you attend your music instructors' or teaching assistants' office hours to ask questions or discuss course material?

Table 9. Part Two Data Results, Undergraduate Music Majors/Minors – Pilot Study 1

MEANS	Low Income	Middle Income
1. Time spent practicing (hours/week)	6.00	10.19
2. Time spent w/colleagues (hours/week)	6.50	12.94
3. Practicing w/colleagues (hours/week)	0.00	1.75
4. Studying w/colleagues (hours/week)	1.00	2.09
5. Electronic communication w/colleagues (occasions/week)	2.00	20.41
6. Electronic communication w/instructors (occasions/week)	.50	3.31
7. Attend instructors' office hours (occasions/ semester)	3.50	4.41
GPA	3.43	3.72

Table 10. Part Two Data Results, Graduate Students – Pilot Study 1

MEANS	Low Income	Middle Income	(High Income)*
1. Time spent practicing (hours/week)	17.00	16.88	(20.00)
2. Time spent w/colleagues (hours/week)	11.00	15.00	(3.00)
3. Practicing w/colleagues (hours/week)	2.00	3.88	(0.00)
4. Studying w/colleagues (hours/week)	.67	.29	(0.00)
5. Electronic communication w/colleagues (occasions/week)	32.83	38.35	(30.00)
6. Electronic communication w/instructors (occasions/week)	3.83	8.76	(10.00)
7. Attend instructors' office hours (occasions/ semester)	7.83	8.29	(0.00)
GPA	3.74	3.92	(4.00)

*(Only one graduate student reported high family income class, so data should be approached with caution.)

Table 11. Part Two Data Results, Non-Music Majors – Pilot Study 1

MEANS	Low Income	Middle Income	High Income
1. Time spent practicing (hours/week)	.67	4.38	5.00
2. Time spent w/colleagues (hours/week)	.67	9.30	2.60
3. Practicing w/colleagues (hours/week)	.67	1.24	.60
4. Studying w/colleagues (hours/week)	.00	1.05	.20
5. Electronic communication w/colleagues (occasions/week)	3.33	6.46	2.20
6. Electronic communication w/instructors (occasions/week)	.33	1.03	.40
7. Attend instructors' office hours (occasions/ semester)	.33	.78	.20
GPA	3.43	3.50	3.55

Survey: Part Three Questions

Participants were asked to answer the following questions using a scale from zero to ten. (Zero represented a response of highly unlikely while ten represented a response of very likely.)

1. If you were struggling to learn the material for one of your music courses, how likely would you be to ask another student for help?
2. If you were struggling to learn the material for one of your music courses, how likely would you be to ask an instructor or a teaching assistant for help?
3. If you were struggling with a performance aspect (pertaining to your voice or instrument), how likely would you be to ask another student for help?
4. If you were struggling with a performance aspect (pertaining to your voice or instrument), how likely would you be to ask an instructor or teaching assistant for help?

Table 12. Part Three Data Results, Undergraduate Music Majors/Minors – Pilot Study 1

MEANS	Low Income	Middle Income
1. Help w/ music material from student	6.00	7.75
2. Help w/ music material from instructor	8.00	6.78
3. Help w/ performance aspect from student	7.00	5.34
4. Help w/ performance aspect from instructor	9.00	8.22
GPA	3.43	3.72

Table 13. Part Three Data Results, Graduate Students – Pilot Study 1

MEANS	Low Income	Middle Income	(High Income)*
1. Help w/ music material from student	7.83	5.53	(9.00)
2. Help w/ music material from instructor	**6.50**	**8.41**	(10.00)
3. Help w/ performance aspect from student	6.50	4.88	(10.00)
4. Help w/ performance aspect from instructor	**8.67**	**9.76**	(10.00)
GPA	3.74	3.92	(4.00)

Bold characters indicate statistically significant comparisons.

*(Only one graduate student reported high family income class, so data should be approached with caution.)

Table 14. Part Three Data Results, Non-Music Majors – Pilot Study 1

MEANS	Low Income	Middle Income	High Income
1. Help w/ music material from student	4.67	5.53	6.20
2. Help w/ music material from instructor	7.00	6.17	7.60
3. Help w/ performance aspect from student	4.00	5.64	4.80
4. Help w/ performance aspect from instructor	6.60	6.67	5.60
GPA	3.43	3.50	3.55

APPENDEX B

PILOT STUDY 2: “CRITICAL WORDS”

Table 15. Female Word-Fragments & Possible Solutions – Pilot Study 2

Female Word-Fragments	Gender Positive	Neutral Solutions
_ _ M	Mom	Arm Bam Ham Hum
P _ _ K	Pink	Park Peek Pick Pork
D _ _ _ S	Dress	Disks Draws Drugs Dumps
S _ _ L L	Small	Shell Skull Still Swell
_ _ _ I N G	Caring	Aching Biking Boring Racing
B E A _ _ _	Beauty	Beaded Beaker Beatle Beaver
_ _ _ T I O N	Emotion	Caption Edition Mention Section

Table 16. Male Word-Fragments & Possible Solutions – Pilot Study 2

Male Word-Fragments	Gender Positive	Neutral Solutions
L _ _ D	Loud	Lewd Lied Load Lord
_ _ _ E R	Power	Flier Liter Maker Water
S T R _ _ _	Strong	Strand Straws Stress Stripe
L _ _ _ E R	Leader	Lifter Litter Looser Luster
C O N _ _ _ _	Control	Confess Confuse Contain Contest
_ U _ _ L E S	Muscles	Bubbles Buckles Hurdles Puddles
S P _ _ _ S	Sports	Spaces Spades Spells Spoons

APPENDEX C

IRB APPROVAL

ASU Knowledge Enterprise Development

APPROVAL: EXPEDITED REVIEW

Joshua Gardner
Music, School of
-
Joshua.T.Gardner@asu.edu

Dear Joshua Gardner:

On 10/14/2016 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	An Exploration of Stereotype Threat in Collegiate Music Education
Investigator:	Joshua Gardner
IRB ID:	STUDY00005009
Category of review:	(7)(b) Social science methods, (7)(a) Behavioral research
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• Consent Form - Diagnostic_Nondiagnostic Groups.pdf, Category: Consent Form; • Verbal Recruitment Script - Part 2 (Pre-Study Word Generation & Testing).pdf, Category: Recruitment Materials; • Part 2 Word Generation Instructions.pdf, Category: Participant materials (specific directions for them); • "Filler word" List, Category: Technical materials/diagrams; • Debrief Form - Diagnostic_Nondiagnostic Groups.pdf, Category: Consent Form; • Verbal Recruitment Script - Part 1 (Survey).pdf, Category: Recruitment Materials; • Recruitment Email Part 1 (Survey).pdf, Category: Recruitment Materials; • Consent Form - Control Group.pdf, Category: Consent Form;

	• Part 2 Diagnostic Instructions.pdf, Category: Participant materials (specific directions for them); • Consent Form - Word Generation Task.pdf, Category: Consent Form; • Recruitment Flyer Part 2 (Word-fragment Completion & Mock Audition).pdf, Category: Recruitment Materials; • Post Study Questionnaire.pdf, Category: Participant materials (specific directions for them); • Survey, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Part 2 Control Group Instructions.pdf, Category: Participant materials (specific directions for them); • IRB Protocol Lloyd, Category: IRB Protocol; • Debrief Form - Control Group.pdf, Category: Consent Form; • Online Consent Form - Survey.pdf, Category: Consent Form; • Part 2 Non-Diagnostic Instructions.pdf, Category: Participant materials (specific directions for them); • Verbal Recruitment Script (Word-fragment Completion & Mock Audition).pdf, Category: Recruitment Materials;

The IRB approved the protocol from 10/14/2016 to 10/13/2017 inclusive. Three weeks before 10/13/2017 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 10/13/2017 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Abby Lloyd
Abby Lloyd
Jill Sullivan

ASU Knowledge Enterprise Development

APPROVAL: MODIFICATION

Joshua Gardner
Music, School of
-
Joshua.T.Gardner@asu.edu

Dear Joshua Gardner:

On 11/2/2016 the ASU IRB reviewed the following protocol:

Type of Review:	Modification
Title:	An Exploration of Stereotype Threat in Collegiate Music Education
Investigator:	Joshua Gardner
IRB ID:	STUDY00005009
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• Part 2 Control Group Instructions.pdf, Category: Participant materials (specific directions for them); • Part 2 Non-Diagnostic Instructions.pdf, Category: Participant materials (specific directions for them); • IRB Protocol: Revised, Lloyd, Category: IRB Protocol; • Part 2 Word Generation Instructions.pdf, Category: Participant materials (specific directions for them); • Debrief Form - Diagnostic_Nondiagnostic Groups.pdf, Category: Consent Form; • Survey Revised, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Post Study Questionnaire.pdf, Category: Participant materials (specific directions for them); • Part 2 Diagnostic Instructions.pdf, Category: Participant materials (specific directions for them); • Consent Form - Control Group.pdf, Category: Consent Form;

	• "Stereotypic word" List, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Verbal Recruitment Script (Word-fragment Completion & Mock Audition).pdf, Category: Recruitment Materials; • Online Consent Form - Survey.pdf, Category: Consent Form; • Verbal Recruitment Script - Part 1 (Survey).pdf, Category: Recruitment Materials; • Consent Form - Diagnostic_Nondiagnostic Groups.pdf, Category: Consent Form; • Survey Recruitment Email Revised, Category: Recruitment Materials; • Verbal Recruitment Script - Part 2 (Pre-Study Word Generation & Testing).pdf, Category: Recruitment Materials; • Debrief Form - Control Group.pdf, Category: Consent Form; • Recruitment Flyer Part 2 (Word-fragment Completion & Mock Audition).pdf, Category: Recruitment Materials; • Consent Form - Word Generation Task.pdf, Category: Consent Form; • "Filler word" List, Category: Technical materials/diagrams;

The IRB approved the modification.

When consent is appropriate, you must use final, watermarked versions available under the “Documents” tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Abby Lloyd
Abby Lloyd
Jill Sullivan

BIOGRAPHICAL SKETCH

Under the guidance of Robert Spring and Joshua Gardner, Abby Lloyd is a candidate for the degree Doctor of Musical Arts in Clarinet Performance at Arizona State University. Concurrently, Lloyd is pursuing the degree Master of Arts in Music History and Literature under the guidance of Kay Norton. From 2014-2017, Lloyd was awarded a teaching assistantship in Music History and Literature within the ASU School of Music. Prior to this appointment, Lloyd was awarded a clarinet fellowship as part of the University of Missouri - Kansas City Graduate Fellowship Woodwind Quintet (2012-2014). Lloyd is an active performer, and she has performed with the Missouri Symphony Orchestra, the 108th Army Band, and the 145th Army Band. As an Army Bandsperson, Lloyd is the recipient of the U.S. Army Achievement Medal for excellent performance at the U.S. Army School of Music. Lloyd is also a grant recipient from ASU's Graduate Support Research Program, and she has presented research at The Society for American Music's annual conferences. You may contact her at abbylloyd03@gmail.com.