

HARMONY OR DISCORD: DISORDERED EATING AND PERSONALITY

TRAITS OF COLLEGE MUSIC MAJORS

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Personality traits, such as neuroticism, perfectionism, and a narrow self-concept have been identified as risk factors for eating disorders or have been found at higher rates in those with eating disorders (e.g., Brannan & Petrie, 2008; Cash & Deagle, 1997; Cervera et al., 2003). Musicians exhibit many of these personality traits associated with eating disorders (e.g., Kemp, 1981), however eating disorder prevalence has not been studied in musicians. The present study examined the prevalence of eating disorders and pathogenic weight control behaviors among college music majors. This study also compared personality traits (i.e., neuroticism, perfectionism, musician identity) between music majors and nonmajors and examined which personality traits best predicted bulimic symptomatology. Participants were 93 female and 126 male undergraduate students majoring in music and a nonmusician comparison group of 310 women 140 men from the same university. Music majors and nonmajors did not differ from each other with regards to eating disorder prevalence rates. Exercising and fasting/strict dieting were the primary means of weight control amongst all participants. With regards to personality traits, female and male music majors reported higher levels of perfectionism than their nonmajor counterparts and male music majors reported higher levels of neuroticism than male nonmajors. After controlling for BMI, neuroticism and doubts about actions predicted bulimic symptoms in female music majors, whereas concern over mistakes predicted bulimic symptomatology among men majoring in music. Findings suggest that any additional appearance-based pressures from the music environment do not translate into increased levels of eating pathology. Music majors higher levels of perfectionism and neuroticism may help them to succeed within the music and perform at a high level. Lastly, personality dimensions of neuroticism and concern over making mistakes predict disordered eating in all students.

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CHAPTER 1

INTRODUCTION

The development of eating disorders is a multidimensional process with many contributing factors (Striegel-Moore & Bulik, 2007), including biological, personality, sociocultural, psychological, and familial. Given the emphasis on appearance within eating disorder diagnoses, sociocultural factors have been central in most etiological theories (Striegel-Moore & Bulik). The sociocultural perspective suggests that industrialized, Western societies emphasize physical appearance, particularly thinness, in determining women's attractiveness, beauty, and worth. For men, the body ideal includes the dimensions of leanness and muscularity, a hypermesomorphic body type that represents youth, physicality, vigor, health, energy, and happiness (Furnham, Badmin, & Sneade, 2002). These "ideal" bodies are communicated not only through media outlets, such as magazines, movies, and TV, but also through family members and friends; all of these sources may encourage women and men to change their bodies, and behaviors, to conform to society's expectations (Brownell, 1991). When such pressures and messages are internalized (or taken on as a self-schema to which people compare their bodies) dissatisfaction with appearance, body size and shape, and self may result because these standards are generally unrealistic (Stice, 2001). Thus, the more societal standards are internalized, the greater the risk for body dissatisfaction, negative affect, and disordered eating (Leit, Gray, & Pope, 2002; Soban, 2006; Stice; Striegel-Moore & Bulik).

Musicians are a subgroup that may be at an elevated risk for the development of eating disorders because of unique sociocultural pressures within the music environment and personality factors that are common within this high-achieving group. From a sociocultural perspective, certain musicians, such as vocalists, soloists and those with prominent roles in

orchestras, may experience pressure to attain a specific physical look or appearance because the visual aspect of music performance is important to audiences and judges (Griffiths, 2010).

Research has indicated an attractiveness bias exists for musicians (Ryan, Wapnick, Lacaille, & Darrow, 2006), which suggests musicians style of dress (Griffiths) and overall appearance (Ryan et al.) effect how their performances are perceived and evaluated. More attractive male and female singers (Wapnick, Darrow, Kovacs, & Dalrymple, 1997) and physically more appealing female violinists (Wapnick, Mazza, & Darrow, 1998) received superior performance ratings in comparison to those who were judged to be less attractive. Among pianists, a positive attractiveness bias has been shown to exist among college and novice performers, but not among professional performers (Ryan et al.). These findings suggest that music is a sub-culture where appearance is related to success and musicians may feel pressure to change their bodies and appearance to achieve at the highest level possible.

The personality of musicians also may increase their risk of developing disordered eating attitudes and behaviors, perhaps even more so than the sociocultural pressures related to appearance. The music environment is highly competitive (Lacaille, Koestner, & Gaudreau, 2007) and to succeed, musicians must be hard working, highly motivated and goal-directed, emotional, focused, perfectionistic, and independent (Brodsky, 2006; Kemp, 1996; Langerdorfer, Hodapp, Kreutz, & Bongard, 2006). These characteristics bear a striking resemblance to the personality traits, such as perfectionism, neuroticism, and narrow self-concept, which are found at elevated rates among individuals with eating disorders (Bardone-Cone et al., 2007; Stein & Corte, 2007; Tasca et al., 2009).

Even though musicians might be considered an “at-risk” group due to sociocultural factors and personality characteristics, to date, only one study has examined eating disorders in

this population (Aksoydan & Camci, 2009) and it focused on orthorexia nervosa, which consists of an obsession with healthy food that can result in consequences similar to anorexia nervosa (Vandereycken, 2011). Thus, the purpose of this study was to (a) ascertain the prevalence of disordered eating (i.e., anorexia nervosa, bulimia nervosa, and Eating Disorder Not Otherwise Specified) and pathogenic weight control behaviors (e.g., vomiting, fasting, laxatives) among comparative samples of music and nonmusic majors, (b) determine how music and nonmusic majors differed in their levels of the personality variables of neuroticism, perfectionism, and musician identity, and (c) examine the extent to which these personality characteristics were related to bulimic symptomatology.

Eating Disorders and Weight Control Behaviors

Disordered Eating Prevalence

Eating disorders are relatively uncommon in the general population, however given mortality rates up to 5.2% (Crow et al., 2009), they have received considerable attention. For example, Hudson, Hiripi, Pope, and Kessler (2007) reported 12-month, point prevalence rates for adults in the United States of: (a) 0.5% for women and 0.1% for men for bulimia nervosa; (b) 1.6% for women and 0.8% for men for binge eating disorder; (c) 0.4% for women and 0.8% for men for subclinical bulimia nervosa and; (d) 0% for women and men for anorexia nervosa. Lifetime rates for women and men were 0.9% and 0.3% respectively for anorexia nervosa and 1.5% and 0.5% for bulimia nervosa.

Male and female undergraduates are a subgroup thought to be at an increased risk for eating disorders (O'Dea & Abraham, 2002; Striegel-Moore & Bulik, 2007) due to high levels of stress, feelings of ineffectiveness, negative feelings about weight, a competitive environment,

pressures to date and find a partner, and increased sociocultural pressures to be attractive (Striegel-Moore, Silberstein, French, & Rodin, 1989; Striegel-Moore, Silberstein, Rodin, 1986). Striegel-Moore et al. (1989) found that during their first year of college, women had a significant increase in dieting and bingeing behaviors. A more recent study found that both women and men ages 18-29 years had a greater prevalence rate for bulimia nervosa and binge eating disorder than those in older cohorts (Hudson et al., 2007). In order to determine prevalence rates among college-aged women, one study administered clinical interviews to 934 Italian women ages 18-25 solicited from voting registries. Point and lifetime prevalence rates, respectively, of 0.39% and 2% were found for anorexia nervosa, and 1.8% and 4.6% for bulimia nervosa; subclinical point prevalence rates of 0.77% and 2.4% were reported for anorexia nervosa and bulimia nervosa (Favaro, Ferrara, & Santonastasio, 2004). Using the Questionnaire for Eating Disorder Diagnosis (QEDD; Mintz, O'Halloran, Mulholland, & Schneider, 1997) to determine eating disorder diagnosis in a sample of college women from the United States, Cohen and Petrie (2005) found that 51.5% could be classified as asymptomatic, 38.9% symptomatic, and 9.6% eating disordered. In a sample of high school and college men from the United States, Tylka and Stubich (2002a) reported prevalence rates of 51% (asymptomatic), 37% (symptomatic), and 12% (eating disordered) when using the QEDD.

Despite the sociocultural and personality variables that would put musicians, particularly college age, at an increased risk for the development of eating disorders, I could locate only one study that has investigated prevalence in this population. Specifically, in a sample of female and male opera singers, ballet dancers, and symphony orchestra players, Aksoydan and Camci (2009) examined the prevalence of orthorexia nervosa. They found 81.8% of opera singers and 36.4% of symphony orchestra musicians met the criteria for this disorder in comparison to 57.6% in a

normative sample of female and male adults from the general population (Ramacciotti et al., 2011). They provided no data concerning the prevalence of more traditional eating disorders (e.g., bulimia nervosa), leaving a void of information about the disordered eating attitudes and behaviors in musicians.

Within the general population, women are at greater risk for the development of eating disorders than men (Hudson et al., 2007); however the male prevalence rates are increasing as they experience greater sociocultural pressures to attain the “ideal” body (Furnham et al., 2002). College students, as a group, experience elevated levels of disordered eating, particularly at the subclinical level, because of general and body-specific pressures along with increased stressors and competitiveness common to the college environment (Striegel-Moore et al., 1989). Within the population of college students, music majors may be at even greater risk for the development of eating disorders than nonmajors because of their perfectionistic, somewhat neurotic, and highly focused approach to life (Bardone-Cone et al., 2007; Stein & Corte, 2007; Tasca et al., 2009). The competitiveness of the environment (Lacaille et al., 2007) and the pressure musicians’ face to appeal visually (and physically) to audiences (Griffiths, 2010) may contribute as well.

Pathogenic Weight Control Behaviors

The prevalence of pathogenic weight control behaviors, such as vomiting, exercise, and taking laxatives, is important because they have been linked to the development of future eating disorders (Bulik, Sullivan & Kendler, 2000). These behaviors have not been examined among college music majors specifically, but have among general college students (American College of Health, 2003; Tylka & Subich, 2002b; White, Renolds- Maler, & Cordero, 2011). For

example, the American College of Health (2003) and Douglas et al. (1997) found that at least 35% of college women and 14% of college men had dieted within the past 30 days and at least 2% of college men and women reported either using diet pills, laxatives, or engaging in self-induced vomiting. In a longitudinal study of weight control behaviors with a combined sample of male and female college students, White et al. (2011) collected data from three separate cohorts over time to determine changes in pathogenic weight control behaviors over time. Findings indicated a significant increase in adherence to weight loss diets over a period of 13 years. Additionally, the students from the most recent, 2008 cohort, reported engaging in the following weight loss behaviors at least once a week: following diet plans (22%), fasting (3%), taking laxatives (2%), taking diuretics (1%), taking diet pills (3%), vomiting after eating (2%), and chewing and spitting food (2%). Tylka and Subich (2002b) found even higher rates of pathogenic weight control behaviors in their sample of high school and college women: restricting (eating fewer than 1,200 calories per day; 36.7%), fasting (25.9%), laxatives (7.2%), diuretics (6.6%), and vomiting after eating to control weight (4.8%). DiPasquale and Petrie (2012) found exercise to be the most frequent compensatory behavior reported by 79% of college women and 48% of college men.

Research supports that eating disorders exist on a continuum, ranging from pathogenic weight control behaviors (e.g., dieting) to clusters of eating disorder symptoms (i.e., subclinical) to clinical eating disorders (Mintz & Betz, 1988). Although used independently by some men and women (e.g., some students may only exercise excessively), such pathogenic weight control behaviors exist on all levels of the eating disorder continuum (Tylka & Stubich, 2002b). Thus, understanding their prevalence and relationship to disordered eating becomes important. Given college students' heightened risk for the development of eating disorders (O'Dea & Abraham,

2002), it is not surprising to find that their use of pathogenic weight control behaviors is elevated as well Douglas et al. (1997). As a group that is hypothesized to be at increased risk for the development of eating disorders, college music majors also would be likely to show a use of pathogenic weight control behaviors that is higher than nonmajors. Unfortunately, no study to date has examined these behaviors amongst musicians (of any age) to determine just how frequently they are used.

Personality and Eating Disorders

Given that all men and women in Western societies are exposed to the societal ideal and given that not everyone develops an eating disorder, it is important to consider how certain personality traits may play a role in determining risk. Anorexic (e.g., rigid, overcontrolled, avoidant) and bulimic (e.g., affective instability, poor impulse control, histrionic) “personality profiles” have been identified and research has shown that individuals who score high in these characteristics generally report more disordered eating (Vitousek & Manke, 1994). Given that research has differentiated the personality of musicians from nonmusicians, showing that musicians are higher in anxiety, neuroticism, and musician identity (Chesky, 2009; Kemp, 1981), it makes sense to examine such traits to determine their relationship to disordered eating. Below I discuss the personality traits of perfectionism, neuroticism, and self-concept, which have been shown to be associated with disordered eating (Brannan & Petrie, 2008; Stein & Corte, 2007; Tasca et al., 2009) and are relatively common among musicians (Chesky; Kemp; Kenny, Davis & Oates, 2004).

Perfectionism

Perfectionism is a multidimensional personality trait characterized by setting excessively high personal standards across situations, allowing little leeway for mistakes, and being highly critical of one's self and performances (Frost et al., 1990). In one multidimensional model of perfectionism, Frost et al. established five general factors: concern over mistakes (tendency to react negatively to personal mistakes), doubts about actions (degree to which an individual believes projects are not completed to satisfaction), personal standards (setting extremely high standards for oneself), parental expectations (belief that parents set excessively high goals), and parental concern (belief that parents are overly critical). Relatedly, Hewitt and Flett (1991) focused on the source or concern of perfectionism, differentiating self-oriented perfectionism (tendency to set high self-standards) from socially prescribed perfectionism (tendency to worry about the judgment of others). Perfectionism has been linked to disordered eating (Frost et al.), in part because of how pressure, from the self or others, to obtain a "perfect body" may increase body dissatisfaction, which is a primary precursor of disordered eating (Stice, 2002). More specifically, perfectionism may moderate the effects of body dissatisfaction on bulimic symptomatology, such that women who are concerned about judgments of others are more likely to exhibit these symptoms, whereas, women who set high standards for themselves are more likely to demonstrate anorexic symptomatology (Brannan & Petrie, 2008).

In two different meta-analyses, researchers have established links between perfectionism and symptoms of eating disorders (Jacobi, Hayward, Zwaan, Kraemer, & Agras, 2004; Stice, 2002), particularly when it is conceptualized multidimensionally (Bardone-Cone et al., 2007). For example, Bastiani, Rao, Weltzin, and Kaye (1995) found that underweight women with anorexia nervosa scored significantly higher on concern over mistakes, personal standards,

parental criticism, doubts about actions, and organization than healthy controls. College women with elevated scores on concerns over mistakes, parental expectations, and doubts about action also had higher levels of neurotic perfectionism, which was related to bulimic behaviors (Pearson & Gleaves, 2006). Similarly, Chang, Ivezaj, Downey, Kashima, and Morady (2008) found parental expectations and concern over mistakes best predicted bulimic symptoms in their sample of college women. A sample of adult women with anorexia nervosa was found to have significantly higher levels of self-oriented and socially-prescribed perfectionism than a control group of adult women with no history of anorexia nervosa (Cockell et al., 2002). Women who were obese and had binge eating disorder scored significantly higher on self-oriented perfectionism than a control group of obese women with no history of binge eating or purging (Pratt, Telch, Labouvie, Wilson, & Agras, 2001). Because researchers have used different samples and measures to understand the relationship between perfectionism and eating disorders there is some variation on which dimensions of perfectionism are most strongly associated with disordered eating (e.g., Chang et al., Pearson & Gleaves). However, perfectionism as a multidimensional construct has consistently been associated with higher levels of disordered eating.

In music, performers are expected to be nothing less than perfect, especially if fame and notoriety are the desired outcomes (Hays, 2002; Kenny et al., 2004; Lacaille et al., 2007; Mor, Day, Flett & Hewitt, 1995). Additionally, musicians appear to be more focused on what they believe is perfect as opposed to what others think they should do. For example, Langendorfer (2008) found that female and male professional orchestra musicians were higher on self-oriented perfectionism than socially prescribed perfectionism. Although few studies have examined perfectionism directly among musicians, researchers have studied performance anxiety (Kenny

et al., 2004; Langerdorfer et al., 2006), which appears to be related to perfectionism and may negatively affect the performances of as many as 73% of musicians (Fehm & Schmidt, 2006). For example, Mor et al. found self-oriented and socially prescribed perfectionism were associated with debilitating performance anxiety in a sample of female and male performing artists that included classical musicians. Similarly, higher levels of parental expectations were associated with more performance anxiety in a sample of female and male professional opera singers (Kenny et al.). This connection between perfectionism and performance anxiety may be due to similarities in the way the constructs are defined. Barlow (2000) described performance anxiety as a fear of failing to obtain desired results, and Langendorfer et al. suggested that the cognitive components of performance anxiety were really concerns about making mistakes. Given the similarities in how perfectionism and performance anxiety are defined, along with the high prevalence of performance anxiety in musicians, it is likely that perfectionism is a trait that would be high in musicians in comparison to nonmusicians, and that specific dimensions of perfectionism, such as concern over mistakes, personal standards, and doubts about action, may then increase their risk of experiencing disordered eating.

Neuroticism

Neuroticism is defined by emotional instability and lack of self-control (Gual et al., 2002), and is comprised of symptoms of anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability (Costa & McCrae, 1992). Individuals high in neuroticism tend to experience greater levels of psychological distress and may cope less effectively than those who are low in neuroticism (Cervera et al., 2003). Therefore, it is not surprising that neuroticism has been associated with eating disorders in clinical (e.g., Cervera et al.; Diaz-Marza, Carrasco,

& Siaz, 2000) and non-clinical samples (e.g., MacLaren & Best, 2009; Miller, Schmidt, Ballancourt, McDougall, & Laliberte, 2006). For example, Miller et al. found significant relationships between neuroticism and symptoms of anorexia nervosa and bulimia nervosa in a sample of undergraduate women. Another study reported that women with anorexic symptomatology scored higher on nearly all facets of neuroticism compared to those who were asymptomatic (MacLaren & Best). In an 18-month longitudinal study of girls and women aged 12 to 21 years, Cervera et al. found that neuroticism increased the chances of developing an eating disorder (anorexia nervosa, bulimia nervosa, or EDNOS) by four times over what was found in those who were low in neuroticism. Neuroticism is thought to predict disordered eating because of the difficulties with coping and emotional instability that comprise the construct (Cervera et al., 2003). Those with higher levels of neuroticism are more susceptible to body dissatisfaction and negative affect that result from internalization of societal pressures around physical appearance and ultimately can lead to disordered eating behaviors (Stice, 2002). Research has consistently demonstrated a relationship between neuroticism and disordered eating (e.g., Diaz-Marza et al., MacLaren & Best) and those with higher levels of neuroticism appear to be at risk for developing eating disorders, in part because of this trait. Therefore, it makes sense to examine eating disorders in musicians, given their high levels of neuroticism (Kemp, 1981).

In studies with musicians, researchers have used the terms neuroticism and anxiety interchangeably. For example, Kemp's (1981) description and measurement of anxiety is quite similar to neuroticism, including emotional instability, insecurity, anxiety, depression, and self-control. In his study, Kemp examined the personality profiles of classical style high-school, college-aged, and professional musicians. High levels of anxiety, in comparison to normative means, were reported in both the college student and professional samples, but not amongst the

high school-aged children. The college-aged music student group and the professionals also reported low ego strength (feeling less emotionally stable), whereas the professional female musicians reported high levels of tension (frustration, driven, overwrought) in comparison to norms. Thus, anxiety may be highest and emotional stability lowest in more established musicians, which may be influenced by their investment and desire for success in the field.

Expanding the research beyond classical musicians into other musical genres, Dyce and O'Connor (1994) found higher levels of neuroticism, compared to norms, in female and male country and rock musicians performing in bars. Gillespie and Myors (2000) and Cooper and Willis (1989) found higher levels among professional jazz, rock, commercial, and pop musicians than in normative adult samples. Although some differences in personality and pressure to perform may exist between classical and popular style musicians (Langendorfer, 2008), neuroticism is a trait that appears to be high among adult musicians, regardless of training or genre.

Research consistently has demonstrated a positive, direct, and predictive relationship between neuroticism and eating disorders (Cerveza et al., 2003; MacLaren & Best, 2009; Miller et al., 2006). Results from studies also have shown that musicians tend to experience higher levels of neuroticism than nonmusicians, though the strength of this relationship may vary by age, level of competence, and investment in a music career. That neuroticism is high in both individuals with eating disorders and musicians, it makes sense to study their potential connection.

Musician Identity

Musician identity is the degree to which individuals identify with their role as a musician,

how central that identity is to their self-concept, and how competent they believe they are in this domain. Musicians who strongly define themselves as such would be motivated to succeed and would experience positive affect from successful performances. Overidentification with one identity, however, can lead to a narrowing of self-concept and ultimately, foreclosure, which is a commitment to one area at the expense of exploring and developing other identities (Schwartz, 2005). Identity foreclosure can occur in competitive environments, such as sports or music, because athletes or musicians may commit to a sport or an instrument at a young age and then concentrate on performances in that area to the exclusion of other activities (Good, Brewer, Petitpas, Van Raalte, & Mahar, 1993; Hays, 2002).

Although there can be positive aspects to developing a strong identity, such as a salient sense of self, achieving high levels of performance, and improving self-esteem (Brewer, Van Raalte, & Linder, 1993; Tasiemski, Kennedy, Gardner, & Blaikly, 2004), negative psychological outcomes also are possible when identity foreclosure and over-commitment to the performance domain occurs (Good et al., 1993). When a narrow, one-dimensional, sense of self develops, performers may experience immense pressure to succeed in that role and self-worth can become dependent on level of success (Jones, Glintmeyer, & McKenzie, 2005). Additionally, research has found that a narrow sense of self, poorly defined self-concept, or unstable identity contribute to the development of disordered eating (Cash & Deagle, 1997; Stein & Corte, 2007). For example, in a clinical eating disorder sample, Stein and Corte found patients with anorexia nervosa and bulimia nervosa identified fewer positive aspects of themselves than healthy controls; patients with anorexia nervosa and bulimia nervosa also reported greater interrelatedness of self-schemas, indicating a narrower concept of the self than controls. These findings indicate that individuals with clinical eating disorders have a more negative view of self

along with less differentiation of identities, or a narrower sense of self, compared to individuals without eating disorders. Further, in a sample of undergraduate women and men from the U.S. and Norway, poorly defined self-concept, as characterized by low clarity or self-knowledge, low self-esteem, and low feelings of control, was related directly to disordered thoughts and behaviors around food (Perry, Silvera, Neilands, Rosenvinge, & Hanssen, 2008). Individuals with a narrow self-concept are thought to be at risk because they may use eating disorders as a means of defining themselves and providing an identity, albeit an unhealthy one. Using body and food for the purpose of self-definition also allows individuals to conform to sociocultural pressures (Stein & Corte, 2006). In general, research has found that a narrow or negative view of self (Stein & Corte) and poorly defined self-concept (Perry et al.) are related to higher levels of disordered eating, however research on self-concept and disordered eating does not appear as highly researched as other personality traits. Therefore, more research on self-concept and disordered eating is needed.

In one study that examined music identity, Chesky (2009) sampled college music majors and college nonmusic majors. Music majors reported a significantly stronger identity with being a musician compared to the nonmusic majors and believed that others' expectations of them in relation to music were greater. Further, through interviews with performers, their teachers, parents, and peers, Davidson (2002) found that over time music identity became the key determinant of self-concept. These findings suggest that music identity increases as more time and resources are invested into being a musician and that additional pressure and expectations from others may further narrow one's self-concept.

Although a strong music identity may increase commitment to the field and facilitate success in performing (Brewer et al., 1993), negative psychological outcomes, such as eating

disorders (Jones et al., 2005), also may result. Because musicians appear to be strongly identified in that role (Chesky, 2009), and long-time musicians, or those highly invested in music, may have a narrow, one-dimensional self-concept (Davidson, 2002), understanding the connection between overidentification with the musician role and musicians' psychological health and well-being is an important next step in the research process.

Current Study

Research suggests that certain personality traits, such as neuroticism (Cervera et al., 2003; Diaz-Marza et al., 2000; Tasca et al., 2009), perfectionism (Brannan & Petrie, 2008; Jacobi et al., 2004), and a narrow self-concept or identity (Cash & Deagle, 1997; Stein & Corte, 2007), may increase individuals' risk of developing an eating disorder (Vitousek & Manke, 1994). Many of the personality traits associated with disordered eating have either been found at high rates in musicians or are hypothesized to be high in musicians because of correlations with other established traits, such as performance anxiety (e.g., Buttsworth & Smith, 1995; Dyce, 1994; Kemp, 1981; Kenny et al., 2004). At present, disordered eating has not been examined in musicians, but given the overlap of personality traits in musicians and those with eating disorders, it is possible that disordered eating attitudes and behaviors are present at levels higher than found in the general population.

The current study examined the prevalence of eating disorders, and pathogenic eating and weight control behaviors among university music majors and nonmajors (as a comparison group). I also compared music majors and nonmajors on the personality dimensions of neuroticism, perfectionism, and musician identity to determine if majors scored higher, as demonstrated in previous research. Finally, I examined the relationship of these three

personality characteristics to bulimic symptomatology after controlling for the influence of actual body size (i.e., BMI), which is a known predictor of disordered eating (Stice, 2002).

Hypotheses for the current study were:

- I. Clinical and subclinical eating disorders will be present in college music majors at a rate higher than reported in a general college sample for men and women.
- II. Among musicians, eating disorders will also be most prevalent among music performance majors because of the instrument groups within the major, along with increased performance pressure. Differences in eating disorder prevalence rates will also exist between instruments.
- III. With regard to pathogenic weight control behaviors, music majors will report engaging in behaviors at higher rates than nonmajors. Dieting and exercising will be the most frequently endorsed behavior across majors and nonmajors.
- IV. With regards to the personality dimensions, female and male music majors will report higher levels of neuroticism, doubts about action, concern over mistakes, personal standards, and musician identity, than their same-sex, non-major counterparts.
- V. Neuroticism will be most strongly related to bulimic symptomatology, followed by elevated levels of concern over mistakes, parental expectations, and doubts about actions. I expect that higher AIMS scores also will be associated with more bulimic symptomatology, though at a level lower than the other two personality variables.

CHAPTER 2

METHOD

Participants

Participants were female ($n = 93$) and male ($n = 126$) undergraduate students majoring in music at a large, public university located in the Southwestern region of the United States. A group of female ($n = 376$) and male ($n = 208$) college students who were not majoring in music also participated (i.e., nonmusic majors). As expected, some non-music majors self-identified as musicians. Because the purpose of this study was to compare students who were music majors (and identified as musicians) to a “control group” of nonmusic majors who also were not involved in or identified with being a musician in any meaningful way, I needed to exclude any nonmusic majors who reported a strong music identity. Thus, I compared the music majors to the non-music majors who self-identified as musicians and the non-music majors who did not self-identify as musicians on the measure of musician identity that was part of the survey the participants completed. There was a significant main effect, $F(2,802) = 933.46, p < .000$, partial $\eta^2 = .70$, across the three levels of group membership. Tukey’s post-hoc analysis revealed significant differences between the three groups: the music majors reported the strongest identification with being a musician ($M = 32.38, SD = 7.13$), followed by the non-music majors who were musicians ($M = 22.93, SD = 5.81$), and then the non-music major, non-musicians ($M = 12.42, SD = 4.81$). Given these differences, I removed the non-music majors who identified as musicians from the sample to ensure that my comparison group was comprised of students who had little to no identification with being a musician.

After removing the non-music majors who were musicians, female participants consisted of 93 music majors and 310 non-music majors between the ages of 18 and 29 years ($M = 20.32$,

$SD = 1.94$). For the male participants, there were 126 music majors and 140 non-music majors between the ages of 18 and 30 years ($M = 20.83$, $SD = 2.42$). Demographic information (i.e., age, grade point average, body mass index, academic status, sexual orientation, race, and parent income) can be found in Table 1.

Of the music majors, 31.2% ($n = 68$) were majoring in music performance, 16.5% ($n = 36$) in jazz studies, and 34.4% ($n = 75$) in music education; 17.4% ($n = 38$) were undecided or majoring in an area not listed and 0.5% ($n = 1$) did not provide a major. They identified voice (16.5%; $n = 36$), strings (18.8%; $n = 41$), brass (29.4%; $n = 64$), woodwinds (22.0%; $n = 48$), keyboard (6.0%; $n = 13$), and percussion (6.4%; $n = 14$) as their primary instruments; 0.9% ($n = 2$) did not indicate a primary instrument. Thirty-two percent ($n = 71$) of music majors reported that their parents were/are musicians, whereas the remaining 67.0% ($n = 146$) indicated that their parents were not. On average, music majors began playing an instrument at 9.44 ($SD = 3.27$) years of age.

Measures

Demographics

Participants provided information regarding sex, age, race/ethnicity, academic status, family of origin (e.g., income level, parents' musician status), music history (e.g., age began playing), current college major, and current instrument(s).

Disordered Eating, Pathogenic Weight Control Behaviors, and Body Image Concerns

The 50-item Questionnaire for Eating Disorder Diagnosis (QEDD; Mintz et al., 1997) assesses the presence or absence of an eating disorder based on *Diagnostic and Statistical*

Manual of Mental Disorders criteria (*DSM-IV*; American Psychiatric Association [APA], 1994). Based on their responses to questions such as, “Do you make yourself vomit to prevent weight gain?” individuals are categorized as asymptomatic (no eating disorder symptoms), symptomatic (some eating disorder symptoms), or eating disordered (anorexia nervosa, bulimia nervosa, sub-threshold bulimia, menstruating anorexia, non-bingeing bulimia, and binge-eating disorder). Adequate test-retest reliability was found over a 2-week ($k = .94$) and a 1-3 month ($k = .64$) time period (Mintz et al.). Using independent measures of eating disorders (i.e., Bulimia Test-Revised and Eating Attitudes Test), the eating disordered group scored significantly higher than those who were asymptomatic on each measure (Mintz et al.). When compared with responses obtained through structured clinical interviews, the predictive validity of the QEDD was .03 (false-negative), .02 (false-positive), .97 (sensitivity), .98 (specificity), .94 (positive predictive power), and .99 (negative predictive power) (Mintz et al.).

In addition to providing information on eating disorder classification, three questions were used to assess their body dissatisfaction; one additional question was asked of the female participants (i.e., “How afraid are you of gaining weight?”). For this question and two others (i.e., “Does your weight and/or body shape influence how you feel about yourself?” and “How afraid are you of becoming fat?”), participants responded on a scale ranging from 1, *not at all*, to 5, *extremely or completely*. For two questions (i.e., “Certain parts of my body are too fat” and “I feel fat all over”), participants responded with *yes* or *no*.

The 36-item Bulimia Test-Revised (BULIT-R; Thelen, Mintz, & Vander Wal, 1996) assesses behaviors and attitudes associated with bulimic symptomatology as defined by the *DSM-IV* (APA, 1994). On the 28 scored items, including “I am afraid to eat anything for fear that I won’t be able to stop,” participants respond using a 5-point scale, ranging from 1, *an*

absence of difficulties, to 5, *extreme difficulties*. Total scores are the sum of the items; higher scores indicate greater endorsement of bulimic behaviors and attitudes. Thelen et al. (1996) reported an internal consistency reliability coefficient of .98 in a sample of undergraduate women controls and bulimic women; Cronbach's alpha in the current study was .93. Test-retest reliability over a 4-6 week period was .83 in a sample of undergraduate women (Brelsford, Hummel, & Barrios, 1992). Thelen et al. (1996) demonstrated that the BULIT-R correctly identified individuals with bulimia nervosa 91% of the time, and correctly identified individuals without bulimia nervosa 98% of the time. They also reported a strong relationship between BULIT-R scores and group membership ($r = .73$) for a sample of female undergraduates and women seeking treatment for bulimia nervosa.

In addition to the overall score that represents bulimic symptomatology, seven items from the BULIT were used to gather information about the use and frequency of pathogenic weight control behaviors. Items assessed for binge eating (frequency and duration) and compensatory behaviors of laxative use, exercising, vomiting, fasting or strict dieting, and diuretic use.

Perfectionism

The 35-item Multidimensional Perfectionism Scale (MPS; Frost et al., 1990) measures six dimensions of perfectionism: Concern over Mistakes (CM; 9 items; tendency to react negatively to personal mistakes), Personal Standards (PS; 7 items; setting extremely high standards for oneself), Parental Expectations (PE; 5 items; belief that parents set excessively high goals), Parental Criticism (PC; 4 items; belief that parents are overly critical), Doubts about Actions (DA; 4 items; degree to which an individual believes projects are not completed to satisfaction), and Organization (O; 6 items; preference for order and organization). Because the

current study sought to explore the maladaptive aspects of perfectionism, the Organization subscale was not used (Ferrier-Auerbach & Martens, 2009). For each item, participants rate their agreement to statements such as “I have extremely high goals,” on a 7-point scale, ranging from 1, *strongly disagree*, to 7, *strongly agree*. Total score for each subscale is the mean of those items; higher scores reflect greater endorsement of that dimension of perfectionism. Frost et al. reported Cronbach’s alphas of .88 (CM), .83 (PS), .84 (PE), .84 (PC), and .77 (DA) in a sample of female undergraduates; the current study had Cronbach’s alpha of .92 (CM), .86 (PS), .81 (PE), .82 (PC), and .83 (DA). The MPS correlated with the Burns Perfectionism Scale ($r = .84$; Burns, 1983), providing evidence for the scale’s validity (Frost et al.).

Neuroticism

The 12-item Neuroticism scale from the NEO-Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992) measures psychological distress, often equated with emotional instability. Items such as “I am not a worrier” are rated on a scale that ranges from 0, *strongly disagree* to 4, *strongly agree*. Raw scores are converted into *T* scores; higher scores reflect higher levels of neuroticism. In a sample of college women, a Cronbach’s alpha of .84 was reported (Brannan & Petrie, 2008); alpha for the current study was .86. A 6-month test-retest reliability of .80 was found in a sample of Australian adults (Murray, Rawlings, Allen, & Trinder, 2003) The Neuroticism scale of the NEO-FFI correlated with the revised version of the NEO Personality Inventory, Neuroticism domain scale ($r = .89$) and with the Anxiety clinical scale on the PAI ($r = .60$), demonstrating its validity.

Musician Identity

The 7-item Athletic Identity Measurement Scale (AIMS; Brewer & Cornelius, 2001) was modified to assess students' identification with the role of being a musician. The rewording of items was consistent with Chesky's (2009) modification the 10-item version of the AIMS for musicians. For example, the original item "Sport is the most important part of my life" was changed to "Music is the most important part of my life." Participants respond to items on a 7-point scale, ranging from 1, *strongly disagree* to 7, *strongly agree*. Total score is the sum; higher scores indicate stronger identification. On the 10-item version of the AIMS that he modified for musicians, Chesky reported a Cronbach's alpha of .84; alpha was .96 in the current study. Brewer, Van Raalte, and Linder have provided extensive information regarding the validity of the original AIMS, whereas Chesky reported a significant difference between music majors ($M = 51.45$, $SD = 7.93$) and non-music majors ($M = 41.75$, $SD = 12.13$) on the modified AIMS, providing support for its validity.

Procedures

Approval was obtained from the University of North Texas Institutional Review Board for Human Subjects Research. Undergraduate and graduate students from the College of Music were recruited to participate in a study on the psychological well-being of musicians through announcements in classes, postings around campus, and by word of mouth. Non-music majors were recruited through the undergraduate research pool through the psychology department. Participants completed consent forms and the previously described measures through a secure website. Questionnaires took 15-20 minutes to complete and were presented to participants in the following order: AIMS, QEDD, NEO, FROST, BULIT, and demographics. A small portion

($n = 64$) of the college music majors completed paper-pencil questionnaires privately, but turned into the principle investigator. College music majors had the option of entering in a drawing to win one of 4 cash prizes of \$50, whereas non-music majors were offered extra credit for a psychology course to compensate for their time.

Data Analysis

First, AIMS, NEO, FROST, and BULIT were screened for missing values (Schlomer, Bauman, & Card, 2010). Data from the AIMS, NEO, and all subscales of the FROST were missing completely at random; BULIT data were missing at random. Across all measures, missing data ranged from 0.0% to no more than 0.9%. Missing data were replaced using the expectation maximization method. Following the missing values analysis, total scores and t -scores, when required, for each measure were obtained and then means, standard deviations, as well as measures of the distributional properties (i.e., skewness, kurtosis), were computed. The total score from the Parental Criticism subscale of the FROST was positively skewed and therefore adjusted using logarithmic procedures (Tabachnick & Fidell, 2007). The data remained skewed after the transformation and analyses were run using both the transformed and non-transformed data. Since the transformed data did not create different results, I report findings based on the non-transformed data.

Descriptive analyses (e.g., frequencies) were run on the demographics of participants. Participants were classified as asymptomatic, symptomatic, or eating disordered, based on QEDD responses and eating disorder prevalence rates were determined (Mintz et al., 1997). Differences between music majors and nonmajors were examined using chi-square analyses. Prevalence of pathogenic weight control behaviors (7 individual items from the BULIT-R) and

body image concerns (4-5 items from the QEDD) by sex and musician status also were computed. To examine the relationship between personality variables, QEDD classification, and major, interactions and main effects were analyzed using multivariate and univariate analyses of variance (MANOVAs and ANOVAs). When MANOVAs were significant, follow-up ANOVAs were conducted. For each level of analysis, effect sizes (i.e., partial η^2 , Cohen's d) were computed.

To examine the relationship between personality factors and bulimic symptomology, hierarchical multiple regressions were run separately by sex and musician status. At Step 1 of the model, BMI was entered to control for the effects of actual physical size. At Step 2, I entered personality factors of neuroticism (i.e., NEO) and musician identity (i.e., AIMS), along with the five subscales of the Frost perfectionism scales (i.e., doubts about action, concern over mistakes, personal standards, parental expectations, and parental criticism).

CHAPTER 3

RESULTS

Eating Disorders and Pathogenic Weight Control Behaviors

Rates of disordered eating by major and sex are presented in Table 2. For both music majors and nonmajors, across both sexes, most were classified as asymptomatic (females - 61.4%; males - 68.2%), followed by symptomatic (females - 32.1%; males - 28.8%), and then eating disordered (females - 6.5%; males - 3.0%). In order to run analyses, the symptomatic and eating disordered groups had to be combined in order to have enough participants per group. Inconsistent with hypothesis one, no significant differences were found between female music majors and nonmajors, $\chi^2(1, n = 403) = .000, p = .983$, nor male music majors and nonmajors, $\chi^2(1, n = 267) = 1.047, p = .306$, on QEDD classification.

I examined QEDD classification by music major (i.e., music performance, jazz studies, music education, and undecided/other) and by instrument group (i.e., voice, strings, brass, woodwinds, keyboard, and percussion). For the women, there was no relationship with music major (jazz studies was removed due to small numbers), $\chi^2(2, n = 86) = .247, p = .884$, nor with instrument group (keyboard and percussion groups were removed due to small sample), $\chi^2(3, n = 82) = .881, p = .830$. For the men, no relationship was found with music major, $\chi^2(3, n = 127) = 3.085, p = .379$, nor instrument (string group was removed due to small numbers), $\chi^2(4, n = 108) = 5.222, p = .265$.

Prevalence rates of pathogenic weight control behaviors, by sex and musician status, are reported in Tables 3-4. For the women, the majority reported binge eating either less than once a month or never (music majors - 83.7%; nonmajors - 78.7%). Exercising for the purpose of weight loss was the weight control behavior most frequently endorsed; 20.7% of music major

and 20.6% of nonmajors reported doing so more than one hour per day. Music majors (16.4%) and nonmajors (31.3%) also reported trying to lose weight by fasting or strict dieting two or more times in the past year. Very few participants reported intentionally vomiting after eating (once a month or more; music majors – 1.1% and nonmajors – 5.8%), using diuretics (once a month or more; music majors – 2.2% and nonmajors – 5.2%), or using laxatives (2-3 times per month or more; music majors - 1.1% and nonmajors – 4.2%).

Among men, the prevalence of binge eating was also low; 74% of majors and 78% of nonmajors denied binge eating or binge eating less than once a month. Exercise was the weight control behavior most commonly endorsed; 15.9% of music majors and 32.1% of nonmajors indicating that they exercise for more than one hour a day for to burn calories. The second most common weight control behavior was fasting or dieting, where 13.5% of music majors and 19.3% of nonmajors reporting doing so at least two times in the past year. Very few majors or nonmajors reported intentionally vomiting after eating (once a month or more; music majors – 1.6%; nonmajors – 5.7%), using diuretics (once a month or more; music majors - 1.6% and nonmajors – 5%), or using laxatives (2-3 times per month or more; music majors – 1.6% and nonmajors – 3.6%).

Personality, Major, and Bulimic Symptomatology

Correlations amongst the personality and bulimic symptomatology variables, by group (e.g., female music majors), are reported in Tables 5 and 6. The BULIT significantly correlated with most dimensions of the Frost for female nonmajors, male majors, and male nonmajors, whereas it was only significantly correlated with doubts about action for female majors. Bulimic symptomatology was also significantly correlated with neuroticism scores for all four groups.

However, BMI did not correlate with any of the perfectionism dimensions or neuroticism among any group. All five dimensions of perfectionism were significantly correlated with each other among all four groups. Neuroticism scores were related to doubts about actions and concern over mistakes for all groups as well as parental concerns in female nonmajors and both groups of men.

Personality and Major

Prior to examining the relationship between personality and bulimic symptomatology, I tested potential differences in the personality variables by musician status (i.e., music major vs. nonmajors). For neuroticism, there was no significant difference between female majors ($M = 52.37$; $SD = 9.82$) and nonmajors ($M = 52.85$; $SD = 10.91$), $F(1, 403) = .107$, $p = .74$, partial $\eta^2 = .000$, though male music majors ($M = 55.58$; $SD = 11.79$) reported higher levels than nonmajors ($M = 52.01$; $SD = 12.00$), $F(1, 267) = 6.00$, $p < .05$, partial $\eta^2 = .02$. Male music majors actually reported the significantly higher levels of neuroticism than the other three groups, $F(3, 670) = 2.58$, $p = .05$, partial $\eta^2 = .011$.

As previously discussed, there were significant differences between music majors and nonmajors on the AIMS for women, $F(1, 403) = 925.79$, $p < .000$, partial $\eta^2 = .689$, and men, $F(1, 267) = 736.72$, $p < .000$, partial $\eta^2 = .735$. Both the female music majors ($M = 32.43$; $SD = 7.60$) and male music majors ($M = 32.47$; $SD = 6.77$), respectively, more strongly identified with the musician role than female ($M = 12.28$; $SD = 4.85$) and male ($M = 12.95$; $SD = 4.92$) nonmajors.

For the perfection subscales, there was a significant multivariate effect for the women, Wilk's Lambda = .055, $F(5, 403) = 13.364$, $p < .0001$, partial $\eta^2 = .14$. Follow-up ANOVAs

revealed that music majors ($M = 2.97$; $SD = 1.14$) had significantly more doubts about their actions than their non-major counterparts ($M = 2.60$; $SD = .93$), $F(1, 403) = 10.65$, $p < .001$, partial $\eta^2 = .026$, were more concerned over mistakes (majors - $M = 3.16$; $SD = 1.05$ vs. nonmajors - $M = 2.64$; $SD = .87$), $F(1, 403) = 20.92$, $p < .0001$, partial $\eta^2 = .050$, and had higher personal standards (majors - $M = 4.05$; $SD = 1.12$ vs. nonmajors - $M = 3.34$; $SD = .69$), $F(1, 403) = 55.05$, $p < .0001$, partial $\eta^2 = .12$. No significant differences were found between majors and nonmajors on parental expectations, $F(1, 403) = .512$, $p = .46$, partial $\eta^2 = .001$, or parental concern, $F(1, 403) = .009$, $p = .93$, partial $\eta^2 < .000$.

For the men, again there was a significant multivariate effect for perfectionism, Wilk's Lambda = .812, $F(5, 267) = 12.06$, $p < .0001$, partial $\eta^2 = .188$. Follow-up ANOVAs revealed that music majors ($M = 3.93$; $SD = .96$) had higher personal standards than nonmajors ($M = 3.40$; $SD = .74$), $F(1, 267) = 28.87$, $p < .0001$, partial $\eta^2 = .10$, and had more doubts about their actions (majors - $M = 3.07$ $SD = 1.14$ vs. nonmajors - $M = 2.57$; $SD = .92$), $F(1, 267) = 13.21$, $p < .0001$, partial $\eta^2 = .047$. No significant differences between majors and nonmajors were found on concern over mistakes, $F(1, 267) = 1.97$, $p = .162$, partial $\eta^2 = .007$, parental expectations, $F(1, 267) = .022$, $p = .883$, partial $\eta^2 = .001$, or parental criticism, $F(1, 267) = 1.83$, $p = .178$, partial $\eta^2 = .007$.

Personality and Disordered Eating

Among female music majors, Step 1 of the model was significant, accounting for 5.8% of the variance, $F(1, 91) = 5.59$, $p < .05$, indicating that greater body mass index was related to higher levels of bulimic symptomatology. In Step 2 of the model, the personality factors accounted for an additional 18% of the variance, $F(7, 84) = 2.78$, $p < .01$. The overall model was

significant, $F(8, 84) = 3.23, p < .01$ and accounted for 24% (adj. $R^2 = .16$) of the BULIT-R variance. Specifically, higher levels of BMI ($\beta = .24$), doubts about action ($\beta = .29$), and neuroticism ($\beta = .24$) were related to the reporting of more bulimic symptomatology (Table 7).

For female nonmajors, Step 1 of the model was significant, though only accounted for 5% of the variance, $F(1, 307) = 15.40, p < .0001$. Personality factors in Step 2 accounted for an additional 26% of variance, $F(7, 300) = 16.38, p < .0001$. The overall model was significant, $F(8, 300) = 16.93, p < .0001$, and accounted for 31% (adj. $R^2 = .29$) of the variance in bulimic symptomatology. Overall, higher BMIs ($\beta = .19$), greater neuroticism ($\beta = .28$), and more concern over mistakes ($\beta = .23$) were related to higher scores on the BULIT-R. See Table 8.

For male music majors, Step 1 of the model was significant, $F(1, 124) = 17.56, p < .0001$, $R^2 = .124$. The personality factors accounted for an additional 19% of the variance in Step 2, $F(7, 117) = 4.534, p < .0001$. The overall model was significant, $F(8, 117) = 6.601, p < .0001$ accounted 31% of the (adj. $R^2 = .26$) the variance in bulimic symptomatology. Overall, higher BMIs ($\beta = .35$) and more concern over mistakes ($\beta = .29$) were related to higher scores on the BULIT-R. See Table 9.

For male nonmajors, Step 1 explained 12% of the variance, $F(1, 138) = 18.02, p < .0001$, and Step 2 added another 23%, $F(7, 131) = 6.49, p < .0001$. The overall model was significant, $F(8, 131) = 8.56, p < .0001$, explaining 34% (adj. $R^2 = .30$) of the BULIT-R variance. A greater BMI ($\beta = .39$), lower personal standards ($\beta = -.26$), more concern over mistakes ($\beta = .26$), and higher levels of neuroticism ($\beta = .30$) were associated with more bulimic symptomatology. See Table 10.

CHAPTER 4

DISCUSSION

Eating Disorders and Pathogenic Weight Control Behaviors

In this study I examined eating disorders in college music majors and a comparative sample of nonmajors. Inconsistent with my hypotheses, female music majors and nonmajors did not differ significantly with regards to their prevalence rates. Among the female majors and nonmajors, rates were relatively consistent with other studies of undergraduates where researchers used the QEDD to determine prevalence (e.g., Cohen & Petrie, 2005; DiPasquale & Petrie, 2012; Mintz et al., 1997). For example, in the development of the QEDD, Mintz et al. found symptomatic and eating disordered rates of 39% and 8%, respectively. In more recent studies (Cohen & Petrie; DiPasquale & Petrie), rates have ranged from 29% to 38% (symptomatic) and 6% to 10% (eating disorder). Similarly, there were no significant differences between male music majors and nonmajors on eating disorder prevalence, though in the clinical category my findings were up to four times lower than has been reported in previous studies using the QEDD with male college students; prevalence in those studies has ranged from 6% to 12% (Sanford-Martens et al., 2005; Tylka & Subich, 2002a). The male majors' and nonmajors' clinical rates, however, were more consistent with population-based studies that have reported prevalence of 0.1% for bulimia nervosa and 0.8% for Binge Eating Disorder for men (Hudson et al., 2007) over a 12-month period.

Regarding the lack of expected differences in the eating disorder prevalence rates of music majors and nonmajors, I consider two explanations. First, given that all the participants were undergraduates at the same university, they were exposed to similar pressures from the broader sociocultural environment and shared a common, general college experience. Any

unique pressures associated with the college music environment simply may not have added appreciably (or uniquely) to the more general pressures and experiences about body, weight, appearance, dating, etc. the two groups share to cause between group differences in disordered eating attitudes and behaviors. In fact, the pressures that the college music majors experience may be more about performance and musical advancement and less about their body shape or size. Second, if there are appearance-based pressures within the music environment, they may not be specific to body size or shape but rather focused on general attractiveness that may be determined primarily by a pretty or handsome face and/or aesthetically pleasing body movements, such as smooth, regular arm movements or an open body posture when playing (Dahl & Friberg, 2007). In previous studies on the attractiveness bias that exists within the field of music, researchers asked evaluators to rate the “physical attractiveness” of musicians. However, the evaluators were not given specific criteria on which to base their judgments so little is known about what they were rating (Ryan et al., 2006; Wapnick et al., 1997; Wapnick et al., 1998). It may be that evaluators judged attractiveness primarily by facial features and expressions (e.g., smile) or the fluidity of body movements as musicians play and perform (Dahl & Friberg), rather than physical size and/or shape. In the future, researchers may want to examine the attractiveness bias in the music environment to determine the extent to which certain types of pressures about appearance exist; that is, what is the relative extent to which pressures within the music environment are focused on body, facial attractiveness, style of dress, movements, general appearance, etc.

No differences were found in prevalence rates within the male and female music majors’ areas of study (i.e., music performance, jazz studies, music education, and undecided/other) or their instrument groups (i.e., voice, strings, brass, woodwinds, keyboard, and percussion).

Prevalence rates of each major and instrument group were comparable to the larger sample of majors and nonmajors. Given that this was the first study to examine eating disorders among various areas of study and instruments comparisons to previous research cannot be made.

Therefore, it is difficult to know if the lack of difference within majors and instrument groups is a function of the current study or if it accurately reflects the music environment.

There are several potential explanations for why I did not find differential rates of eating disorders within music majors' areas of study and amongst the different instrument groups.

First, as discussed previously, it may be that the appearance-based pressures that are unique to the college music environment are not focused on body and weight. If so, then they may not translate to difficulties with disordered eating and thus no between group differences (within area of study or instrument group) would be expected. Second, with regards to differences between areas of study, all participants identified a primary instrument for which they took classes. And, regardless of area of study, the majority of participants played in school ensembles where they were subject to tryouts, evaluation, and criticism. It is likely that pressure (appearance and those related to playing their instruments) are greatest when music majors are in such performance situations. Given that most of the music majors were performing at some level, regardless of area of study, they could have been experiencing similar levels of pressure. Outside of the college music environment, when they go into their specific careers, music performance majors will be subject to greater appearance-based pressures than the other three fields of study. Future research may want to examine this question within the population of established, career musicians.

Third, the lack of findings between instrument groups also might be a result of the way analyses were run. Given the small number of participants representing each individual

instrument, they had to be grouped into six broad groups (i.e., voice, strings, brass, woodwinds, keyboard, and percussion) to have sufficient numbers of participants in each group to run analyses. Given the personality differences that can exist between instruments (Willis & Cooper, 1984), it would have been ideal to make comparisons between musicians who played specific instruments, rather than comparing broad categories of instruments. It is possible that if numbers in the current study were large enough to analyze by each individual instrument, differences in eating disorder rates may have been found. In the future, researchers may want to make comparisons in eating disorder prevalence and environmental pressures between individual instruments, rather than groupings of instruments

In terms of the binge eating, male and female music majors reported prevalence rates that were comparable to their nonmajors counterparts. Specifically, 16.3% (majors) and 21.3% (nonmajors) of women and 22.2% (majors) and 22.1% (nonmajors) of men reported binge eating at least twice per month. Prevalence of binge eating in the current study was lower than has been reported amongst college athletes when the same BULIT-R question has been used; rates in those studies have ranged from 36.7% (females) to 25.1% (males) (Greenleaf, Petrie, Carter, & Reel, 2009; Petrie, Greenleaf, Reel, & Carter, 2008). Given that athletes generally consume larger amounts of food than their nonathlete peers (Cole et al., 2005) to meet their energy expenditure needs, higher self-reported rates of binge eating makes sense. Regardless, about one-fifth of music majors and nonmajors indicate binge eating with a relatively high level of frequency. Such behaviors may contribute over time to the development of more severe eating pathology and future research might examine such behaviors longitudinally.

The students reported exercising more than an hour per day and fasting or strict dieting two or more times per year as their primary mechanisms for controlling their weight, which was

consistent with past research (Greenleaf et al., 2009; Petrie et al., 2008). For example, in a sample of female college athletes, Greenleaf et al., found 26% of participants exercised to control their weight and 16% reported fasting or going on strict diets two or more times per year; amongst male collegiate athletes the rates were 37% and 14%, respectively (Petrie et al.). The majors and nonmajors in the current study, similar to the male and female college athletes (e.g., Petrie et al.), likely used exercise and fasting/dieting as their primary means of weight control because these behaviors are normalized in society in general and in the college environment specifically. These behaviors may be viewed as healthy by others and thus can be “hidden” and not draw attention when individuals engage in them (Sherman & Thompson, 2001).

Regarding other weight control methods, consistent with previous research (DiPasquale & Petrie, 2012; White et al., 2011), the majors and nonmajors, regardless of sex, used diuretics and laxatives much less frequently; rates ranged from 1.6% to 5.2% (using diuretics once a month or more) and 1.1% to 4.2% (using laxatives twice a month or more). Tylka and Subich (2002b) found that the women in their sample reported taking laxatives and diuretics at rates of 7.2% and 6.6%, respectively. Regarding intentional vomiting after eating, 5.8% of female and 5.7% of male nonmajors reported doing so at least once a month, which is consistent with previous research (DiPasquale & Petrie; Tylka & Subich, 2002a). It is interesting that music majors’ rates of vomiting were lower than nonmajors, ranging from 1.1% (women) to 1.6% (men). It is possible that musicians use self-induced vomiting less frequently because of the damage that it that can cause to vocal cords and to the esophagus (Denholm & Jankowski, 2011). Such damage would affect breath control and the musician’s ability to perform at the desired level. Qualitative studies with musicians could explore the reasons why they use (or do not use) certain weight control behaviors and how such behaviors might affect their performances

Personality and Major

With regards to perfectionism, the female and male music majors reported having higher personal standards for themselves and had more doubts about their actions than their nonmajor counterparts. Additionally, female music majors expressed more concern over the mistakes they made than did the female nonmajors. Researchers consistently have found that musicians have high personal expectations, fear of not being able to attain their desired level of performance, and are concerned about making mistakes while playing their instrument (Langendorfer et al., 2006; Langendorfer, 2008). For example, Langendorfer et al. (2006) found that musicians from symphony and opera orchestras reported concerns over not meeting the expectations of others during their rehearsals and fears of failing to meet one's own standards during performances. These musicians' fears of not meeting their own standards or the standards of others also were related to performance anxiety, a common problem for musicians (Fehm & Schmidt, 2006). Music majors experience constant evaluations and face significant consequences (e.g., not progressing through school, not passing juries, not being selected for ensembles) if they do not perform consistently at a high level. Given these environmentally-based performance pressures, it makes sense that musicians would experience self-doubt and want to avoid making mistakes in what they do.

Within the music environment, perfectionism research also has focused on how teachers, judges, and others in the field set standards for and evaluate fellow musicians and music students (Hays, 2002; Kenny et al., 2004; Lacaille et al., 2007); no studies on perfectionism, though, have examined expectations or criticism from parents amongst musicians, so I did not hypothesize differences between majors and nonmajors. In the current study, female and male majors and nonmajors did not differ on parental criticism or expectations. These findings suggest that,

regardless of whether the college students are studying music or not, they experience comparable levels of expectations and criticism from their parents. Given that all the students are pursuing a degree in higher education at the same university, parents' expectations may be focused, generally, on being academically successful, regardless of degree area.

Consistent with past research (Dyce & O'Connor, 1994; Kemp, 1981), male majors and nonmajors differed significantly from each other on their levels of neuroticism; the two groups of women did not. Male music majors not only reported greater levels of neuroticism than their nonmajor counterparts, but also scored higher than the female music majors and female nonmajors. In general, women consistently report higher levels of neuroticism than men (e.g., Lippa, 2010), which occurred in relation to the male nonmajors, but not the male majors. My findings suggest that male musicians may be qualitatively (and quantitatively) different in their experience of neuroticism. Successful musicians are emotionally open and vulnerable and often communicate their feelings while playing through their facial expressions and body movements (Dahl & Friberg, 2007). Such emotionality also helps musicians to connect with their audiences, which is an important aspect of a successful performance (Hays, 2002). The music environment, which is defined through the creativity and emotionality of its members (Buttsworth & Smith, 1995; Dyce & O'Connor), may attract men who would score high on a standard measure of neuroticism; these men might feel "at home" in this environment and their emotionality may aid them in their performance success. It also may be that the music environment shapes the men over time, pushing them to become more emotionally open and expressive and thus contributing to their elevated neuroticism. Through the feedback and observations they receive from teachers and audiences, male musicians may learn that their ability to access and transfer their emotions

into their playing make them better musicians. Future studies might examine neuroticism longitudinally to determine the extent to which it may change within male musicians over time.

Female and male music majors reported higher levels of musician identity than nonmajors, which was expected given past research and the fact that this scale assesses the extent to which individuals are involved with music and consider it to be an essential part of their identity. In the one other study to examine musician identity in this manner, Chesky (2009) compared the scores of college music majors and nonmajors on a multidimensional version of the AIMS modified for musicians and found that music majors endorsed significantly higher levels of musician identity as a whole and on each dimension of musician identity (i.e., social identity, exclusivity, and negative affectivity) compared to nonmajors. The ability of the AIMS to discriminate between music majors, self-identified musicians not majoring in music, and nonmusician nonmajors in the current study provides additional evidence for its validity and indicates that it can be used successfully to differentiate amongst individuals' level of involvement and identification with music. With two studies now validating the modified AIMS amongst musicians, future research may be able to examine this construct in relation to other areas of musician well-being and health, such as substance use, anxiety, and depression.

Personality and Bulimic Symptomatology

Because body composition (as represented by BMI) is related strongly to bulimic symptomatology (e.g., Stice, 2002), I controlled for its influence prior to determining the extent (and direction) to which the personality factors were associated with the BULIT-R scores. After controlling for BMI, neuroticism was a significant predictor of bulimic symptomatology for three out of the four groups; only the relationship with male music majors was not significant.

Previous research (e.g., Brannan & Petrie, 2008; Cervera et al., 2003) has demonstrated a direct relationship between neuroticism and bulimic symptoms in samples of adolescent and college women. Individuals with high levels of neuroticism may react more emotionally to their body, expressing strong dissatisfaction (even disgust) with their size, shape, and appearance and experiencing negative emotions about themselves (e.g., self-doubt, feelings of inadequacy). Individuals who are neurotic may try to cope with such negative feelings about self and high levels of dissatisfaction through eating and/or trying to change their bodies to fit the societal ideal. In either case, these behaviors might contribute to increases in disordered eating symptoms (Brannan & Petrie). The lack of significant findings with the male music majors was surprising given past research (Tylka & Subich, 2002a), though it may be that the effects of neuroticism are different for male musicians; that is, neuroticism may be related more strongly to other psychological disorders, such as substance abuse, depression or anxiety. For example, in a sample of professional male jazz musicians, Willis (2003) found that at some point in their lives, 52% had a heroin addiction, 15% abused alcohol, and 7.5% were dependent on cocaine. Additionally, several participants in his study met criteria for other mental disorders, such as a depression or anxiety. In future studies with male musicians, researchers may want to determine not only if neuroticism changes over time, but its relation to other mental health outcomes and potentially deleterious behaviors.

With regards to perfectionism, concern over mistakes was associated with higher levels of bulimic symptomatology in three out of four groups; nonsignificant results were found only for female music majors. Previous research has shown that when college women are concerned about the mistakes they make, they report more bulimic symptomatology (Chang et al., 2008). Concern over mistakes consists of general fears of failure or rejection as a result of mistakes

made, along with fears of rejection or failure in specific areas, which could include music or appearance. Individuals who generally worry about making mistakes may be more likely to worry about body or appearance flaws being noticed and seen as imperfections by others. This hypervigilance toward potential body flaws may drive some to try to change their bodies to more closely align with the societal ideal. In such instances, individuals might engage in compensatory behaviors (e.g., purging, laxative use, exercise) to try to lose weight and decrease the body flaws they perceive.

I offer two explanations for the finding that concern over mistakes was not related significantly to bulimic symptomatology in female music majors. First, the female music majors were the smallest of the four groups and the beta value for this relationship was modest ($\beta = 0.17$). It may simply be that the power for this analysis, because of the small sample, was too low to be significant. Second, female music majors' fears about making mistakes and being rejected may be more salient to their music performances and success as a musician rather than to the size and shape of their bodies. Concern over mistakes was assessed generally and it is possible that female music majors were considering music, a highly salient aspect of their identity, rather than their body or appearance when they responded to items. To better understand the relationship between concerns over mistakes and eating disorders in musicians, it would be helpful for future research to examine the direction of the concerns (e.g., general, towards the body, towards music) and if they are related to other health outcomes (e.g., substance abuse, depression, anxiety) or to improvements in performance.

Doubts about actions only predicted bulimic symptomatology in female music majors. This dimension of perfectionism consists of self-doubt in one's ability to do even simple, daily activities "right" and may lead to individuals spending excessive amounts of time on tasks.

Doubts about actions is a component of neurotic perfectionism, which predicts disordered eating (Pearson & Gleaves, 2006) and it also has been found to predict body dissatisfaction (Chang et al., 2007). Doubting actions may be related to bulimic symptomatology in that the fear of falling short likely also translates to appearance and increases body dissatisfaction, as Chang et al found. It makes sense that individuals who worry about doing small things “right” would also be concerned about failing to meet societal expectations for appearance and thus struggle with body dissatisfaction, which predicts bulimic symptomatology (Stice, 2001). Given the precision and continual judgment in music (Hays, 2002; Langerdorfer et al., 2006), music majors do worry about doing things correctly. It is possible that for female majors, these doubts also transfer to appearance and lead to an increase in bulimic symptomatology. Male majors also experience high levels of doubts about their actions, but their self-doubt does not appear to increase disordered eating. These gender differences may be due to women in general experiencing greater sociocultural pressures than men to look a specific way (Striegel-Moore & Bulik, 2007).

The finding that low levels of personal standards were associated with bulimic symptomatology among male nonmajors was unexpected. Among this group, high levels of concern over mistakes and neuroticism, along with low personal standards, predicted bulimic symptomatology. It is possible that the combination of high anxiety and low standards decreases self-esteem because these individuals are experiencing conflict around their expectations for themselves. Previous research has found that low self-esteem predicts bulimic symptomatology in college women (Watson, Steele, Bergin, Fursland, & Wade, 2011) and that low self-esteem is correlated with body dissatisfaction among college men (Olivardia, Pope, Borowiecki, & Cohane, 2004). Men with low self-esteem who are body dissatisfied may be more likely to engage in pathogenic eating and weight control behaviors as they attempt to reshape their body

and reduce their dissatisfaction. By becoming leaner and more muscular, which is consistent with the male appearance ideal (Leit, Gray, & Pope, 2002), they may expect to feel better about their bodies and themselves. Future research should investigate this potential connection to determine if the effects of low personal standards and parental criticism on bulimic symptomatology are mediated by decreases in self-esteem.

Musician identity, as measured by the AIMS, was not related significantly to bulimic symptomatology in female or male music majors. Although research has indicated that identity foreclosure is associated with negative psychological outcomes (Good et al., 1993) and a narrow sense of self is associated with disordered eating (Stein & Corte, 2007), I did not find such a relationship. It may be that having a high level of musician identity does not translate automatically to a narrowed sense of self and the experience of its potential detrimental effects. It is possible that music majors highly identify with their role as a musician, as suggested by their scores on the AIMS, but also have other salient aspects to their identity, such as being a college student, son/daughter, boyfriend/girlfriend, etc. Schwartz (2005) encouraged researchers to conceptualize identity in a multidimensional fashion that integrates context, personal values, and social roles. Therefore, in future studies, researchers might consider other factors, such as personal values and social identity, which predict identity foreclosure (Schwartz) and determine to what extent musician identity contributes to overall self-concept. A strong musician identity may be a risk factor, but only in the context of low levels of other salient identities.

Limitations and Future Directions

Several limitations exist in the current study that warrant discussion. First, although the overall size of the musician samples was adequate, I did not have sufficient numbers of

musicians from certain instruments to make all the comparisons I that I wanted. Thus, I could not make comparisons at the specific instrument level and had to resort to broader groups of instruments, such as voice, strings, brass, woodwinds, keyboard, and percussion. Second, the reliance on self-report measures to determine prevalence of eating disorders and related symptoms can lead to inaccurate rates. To minimize this effect, a valid, reliable measure intended to diagnose eating disorders in accordance with current diagnostic criteria was used. However, because follow-up diagnostic interviews were not conducted, QEDD classification and diagnosis could not be confirmed. In future studies, if possible, researchers may want to include a diagnostic interview for confirmation purposes. Third, although a matched sample of nonmusicians was obtained, all participants were drawn from one university. Thus, the generalizability of the results is limited to schools with similar musician and nonmusician student populations. Similarly, the musician sample at this university represented an elite group as the college of music was nationally ranked, so it will be important to examine college musicians from less prestigious schools to determine the extent to which disordered eating attitudes and behaviors are present and related to these different aspects of personality. Fourth, given that all data were collected at once, comparisons across time were not possible and conclusions about causality or risk could not be made. Lastly, albeit significant, personality traits only accounted for a small portion of variance in bulimic symptomatology. Although the current study provides some insight into factors contributing to bulimic symptoms in music majors and nonmajors, additional research is needed to determine what other psychosocial factors may play a role in elevating college music students' risk.

Given that this study is the first to directly examine disordered eating in musicians additional research in this area is needed. In addition to examining the sociocultural pressures

and attractiveness bias that might exist within the music environment, it would be helpful to understand the extent to which musicians internalize appearance-based pressures. Thus, future research on musicians and eating disorders could examine sociocultural pressures specific to music and the internalization of such pressures, along with their influence on disordered eating. Additionally, because a relatively small, albeit significant portion of bulimic symptomatology was accounted for by personality factors, researchers may want to examine other variables, such as social self-concept and goal orientation, to better understand what predicts bulimic symptomatology. Previous research has suggested that musicians may experience high levels of social anxiety (Osborne & Kenny, 2005) and adopt an ego goal orientation (e.g., a focus on demonstration of competence and normative comparison; Lacaille, Whipple, and Koestner, 2005). Because these traits have been related to eating disorders in general, elevations in them may produce even stronger effects (Brannan & Petrie, 2008; Godart, Flament, Lecrubier, & Jeammet, 2000).

Implications for Counseling

The results of the current study have implications for counseling and prevention of eating disorders with college music majors. First, counselors should be aware that college music majors report rates of eating disorders and pathogenic weight control behaviors that are similar to those of the general student population. As a result, music majors may be just as likely as nonmajors to come to counseling centers experiencing body dissatisfaction and engaging in pathogenic weight control behaviors and be in need of assistance to work through their symptoms and distress. Second, music majors experience high levels of perfectionism (i.e., doubts about action, concern over mistakes, personal standards) and neuroticism. And, for some

of these groups of college students, these personality traits are related to increases in reported bulimic symptomatology and may contribute to difficulties in other areas. For example, high levels of perfectionism may increase the amount of academic pressure that music majors experience, such as anxiety around tests because of personal doubts and fears of making mistakes or failing to meet standards. These same traits also may increase anxiety prior to music performances or tryouts. High levels of neuroticism may increase risk for other psychological disorders, such as substance abuse, so therapists might want to assess for use of substances or other maladaptive coping behaviors. Lastly, music majors would benefit from prevention programs geared towards coping and stress reduction, given their high levels of neuroticism and perfectionism. Mindfulness training has been found to help musicians perform at higher levels while experiencing performance anxiety (Lin, Chang, Zemon, & Midlarsky, 2008) so programs teaching mindfulness and meditation likely would increase success in music and in school, along with improving overall mental health. Given their comparable rates of disordered eating behaviors, music majors also would benefit from participating in prevention based programs that are geared toward reducing risk by targeting the internalization of the societal beauty ideal. For example, research has found that multi-session intervention programs focused on resisting sociocultural pressures for attractiveness, body satisfaction, self-esteem, and healthy weight management behaviors (Stice & Shaw, 2004) have been effective at preventing eating disorders among individuals, such as college students, who are at increased risk for disordered eating.

Summary

College music majors experience rates of eating disorders and pathogenic weight control behaviors that are similar to their nonmajor counterparts, which suggests that whatever

additional appearance-based pressures within the music environment that musicians may experience, these pressures do not translate to increased levels of eating pathology. With regards to personality differences, music majors generally reported higher levels of perfectionism than nonmajors. Male music majors reported the highest levels of neuroticism, whereas female music majors reported the greatest concern over mistakes they made, compared to all four groups. Neuroticism, doubts about action, and concern over making mistakes were related to higher levels of bulimic symptomatology, even after controlling for the majors' and nonmajors' body composition. Thus, it appears that these personality dimensions, excluding musician identity, may contribute to level of disordered eating, regardless of the students' involvement in music.

Table 1

Participant Demographics

Demographic Variable	Women		Men	
	Music Majors (<i>n</i> = 93)	Nonmajors (<i>n</i> = 310)	Music Majors (<i>n</i> = 126)	Nonmajors (<i>n</i> = 141)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Age	19.94 (1.45)	20.49 (2.12)	20.76(1.97)	21.06 (2.75)
Grade Point Average	3.51 (.46)	3.08 (.64)	3.37 (.50)	2.84 (.67)
Body Mass Index	23.07 (4.57)	23.84 (5.43)	25.16 (5.35)	25.42 (5.13)
	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)
Year in School				
Freshmen	32.2 (30)	30.0 (93)	27.6 (35)	29.3 (41)
Sophomore	23.7 (22)	22.6 (70)	19.7 (25)	24.3 (34)
Junior	25.8 (24)	28.4 (88)	15.7 (20)	21.4 (30)
Senior/5 th year	18.3 (17)	19.0 (59)	37.0 (47)	25.0 (35)
Sexual Orientation				
Heterosexual	93.5 (87)	88.4 (274)	92.9 (118)	91.4 (128)
Lesbian/Gay	2.2 (2)	4.2 (13)	5.5 (7)	3.6 (5)
Bisexual	3.2 (3)	5.2 (16)	1.6 (2)	1.4 (2)
Asexual	0.1 (1)	2.3 (7)	0.0 (0)	3.6 (5)
Race				
White, Non-Hispanic	65.6 (61)	57.4 (178)	75.6 (96)	57.9 (81)
Black, Non-Hispanic	0.0 (0)	12.3 (38)	3.1 (4)	19.3 (27)
Hispanic	1.1 (1)	0.0 (0)	1.6 (2)	0.0 (0)
Asian Indian	0.0 (0)	2.3 (7)	0.0 (0)	1.4 (2)
Chinese	0.0 (0)	1.0 (3)	1.6 (2)	0.7 (1)
Japanese	1.1 (1)	0.3 (1)	0.0 (0)	0.0 (0)
Korean	4.3 (4)	0.3 (1)	1.6 (2)	0.0 (0)
Vietnamese	1.1 (1)	1.0 (3)	0.0 (0)	0.7 (1)
Other Asian	0.0 (0)	1.9 (6)	0.8 (1)	0.7 (1)
Filipino	1.1 (1)	0.0 (0)	0.0 (0)	0.7 (1)
Other Pacific Islander	1.1 (1)	0.6 (2)	0.0 (0)	0.0 (0)
Multiracial	24.7 (23)	22.9 (71)	15.7 (20)	18.6 (26)
Parent Income Bracket				
\$0- \$24,999	6.6 (6)	11.0 (34)	10.3 (13)	10.0 (14)
\$25,000- \$49,999	17.6 (16)	20.0 (62)	16.7 (21)	18.6 (26)
\$50,000- \$74,999	25.3 (23)	22.6 (70)	19.0 (24)	22.9 (32)
\$75,000- \$99,999	28.6 (26)	16.5 (51)	18.3 (23)	17.9 (25)

(table continues)

Table 1 (continued).

Demographic Variable	Women	Men	Music	Nonmajors
	Music Majors	Nonmajors	Majors	
	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)	% (<i>n</i>)
\$150,000- \$199,999	2.2 (2)	8.1 (25)	9.5 (12)	5.7 (8)
\$200,000+	3.3 (3)	6.5 (20)	4.0 (5)	5.0 (7)

Note. Grade Point Average is represented on a 4.0 scale. Body Mass Index (BMI) is represented in kg/m².

Table 2

Eating Disorder Prevalence from QEDD

QEDD Classification	Women		Men	
	Music Majors (91) % (n)	Nonmajors (311) % (n)	Music Majors (126) % (n)	Nonmajors (141) % (n)
Asymptomatic	61.5(56)	61.4 (191)	65.1 (82)	70.7 (100)
Symptomatic	36.3 (33)	30.9 (96)	32.5 (41)	25.7 (36)
Eating Disordered	2.2 (2)	7.7 (24)	2.4 (3)	3.6 (5)

Note. The values are the percentage of participants classified as asymptomatic, symptomatic, and eating disordered. Non majors include only participants that did not self-identify as musicians

Table 3

Prevalence of Pathogenic Weight Control Behaviors- Women

	Music Majors (<i>n</i> = 92)		Nonmajors (<i>n</i> = 310)	
	%	<i>n</i>	%	<i>n</i>
Frequency of Binge Eating (i.e., eat uncontrollably to the point of stuffing yourself)				
> 2 times/week	1.1	1	2.9	9
2 times/week	1.1	1	4.2	13
Once a week	4.3	4	4.5	14
2-3 times/month	8.7	8	9.7	30
Once a month or never	83.7	77	78.7	244
Duration of Binge Eating				
3 or more years	6.5	6	6.5	20
1 to 3 years	4.3	4	6.8	21
3 months to 1 year	3.3	3	5.8	18
Less than 3 months	4.3	4	5.8	18
Don't binge eat	80.4	74	75.2	233
Exercise in Order to Burn Calories				
> 2 hours/day	1.1	1	1.9	6
2 hours/day	5.4	5	7.7	24
More than 1 hour/day	14.1	13	11.0	34
< 1 hour/day	39.1	36	45.2	140
Don't exercise to burn calories	40.2	37	34.2	106
Tried to Lose Weight by Fasting or Going on Strict Diets				
Most or all of the time	2.2	2	6.5	20
4-5 times in past year	3.3	3	6.8	21
2-3 times in past year	10.9	10	18.1	56
Once in past year	20.7	19	14.2	44
Never or not in past year	63.0	58	54.4	169
Intentionally Vomit After Eating				
≥ Twice a week	0.0	0	1.0	3
Once a week	0.0	0	1.0	3
2-3 times/month	0.0	0	2.3	7
Once a month	1.1	1	1.6	5
< Once a month or never	98.9	91	94.2	292
Use Diuretics to Help Control Weight				
≥ 3 times/week	0.0	0	1.0	3
1-2 times/week	1.1	1	1.6	5

(table continues)

Table 3 (continued).

	Music Majors (<i>n</i> = 92)		Nonmajors (<i>n</i> = 310)	
	%	<i>n</i>	%	<i>n</i>
2-3 times/month	0.0	0	1.3	4
Once a month	1.1	1	1.3	4
< Once a month or never	96.7	89	94.8	294
Use Laxatives/Suppositories to Help Control Weight				
≥ Once a day	0.0	0	1.3	4
3-6 times/week	1.1	1	0.6	2
1-2 times/week	0.0	0	1.0	3
2-3 times/month	0.0	0	1.3	4
< Once a month or never	98.9	91	95.8	297

Table 4

Prevalence of Pathogenic Weight Control Behaviors- Men

	Music Majors (<i>n</i> = 126)		Nonmajors (<i>n</i> = 140)	
	%	<i>n</i>	%	<i>n</i>
Frequency of Binge Eating (i.e., eat uncontrollably to the point of stuffing yourself)				
> 2 times/week	0.8	1	2.1	3
2 times/week	3.2	4	8.6	12
Once a week	7.1	9	5.0	7
2-3 times/month	11.1	14	6.4	9
Once a month or never	77.8	98	77.9	109
Duration of Binge Eating				
3 or more years	9.5	12	8.6	12
1 to 3 years	3.2	4	2.1	3
3 months to 1 year	11.1	14	5.7	8
Less than 3 months	2.4	3	4.3	6
Don't binge eat	73.9	93	79.3	111
Exercise in Order to Burn Calories				
> 2 hours/day	2.4	3	5.0	7
2 hours/day	3.2	4	15.0	21
More than 1 hour/day	10.3	13	12.1	17
< 1 hour/day	30.2	38	25.0	35
Don't exercise to burn calories	54.0	68	42.9	60
Tried to Lose Weight by Fasting or Going on Strict Diets				
Most or all of the time	4.8	6	7.1	10
4-5 times in past year	1.6	2	5.7	8
2-3 times in past year	7.1	9	6.4	9
Once in past year	10.	13	10.7	15
Never or not in past year	76.2	96	70.0	98
Intentionally Vomit After Eating				
≥ Twice a week	0.0	0	1.4	2
Once a week	0.8	1	0.7	1
2-3 times/month	0.0	0	2.1	3
Once a month	0.8	1	1.4	2
< Once a month or never	98.4	124	94.3	132
Use Diuretics to Help Control Weight				
≥ 3 times/week	0.0	0	0.7	1
1-2 times/week	0.0	0	1.4	2

(table continues)

Table 4 (continued).

	Music Majors (<i>n</i> = 126)		Nonmajors (<i>n</i> = 140)	
	%	<i>n</i>	%	<i>n</i>
2-3 times/month	0.8	1	1.4	2
Once a month	0.8	1	1.4	2
< Once a month or never	98.4	124	95.0	133
Use Laxatives/Suppositories to Help Control Weight				
≥ Once a day	0.0	0	1.4	2
3-6 times/week	0.8	1	0.7	1
1-2 times/week	0.0	0	0.7	1
2-3 times/month	0.8	1	0.7	1
< Once a month or never	98.4	124	96.4	135

Table 5

Correlations for Female Music Majors (n = 93) and Nonmajors (n =309)

Variable	1	2	3	4	5	6	7	8	9
1 BULIT-R	---	.22**	.43**	.45**	.61**	.10*	.26**	.47**	.16**
2 BMI	.24*	---	.07	.02	-.04	-.01	.09	.08	.06
3 FROST-DA	.26*	.10	---	.76**	.38**	.29**	.55**	.57**	.29**
4 FROST-CM	.22	.05	.67**	---	.48**	.34**	.57**	.59**	.25**
5 FROST-PS	-.07	-.11	.41**	.63**	---	.34**	.28**	.09	.13**
6 FROST-PE	-.07	-.13	.44**	.46**	.59**	---	.59**	.13*	.05
7 FROST-PC	.00	.00	.57**	.55**	.41**	.60**	---	.39**	.14**
8 NEO	.31**	.09	.45**	.39**	.10	.10	.26*	---	.19**
9 AIMS	-.04	.21*	.30*	.40**	.54**	.30*	.21*	.28*	---

Note. Correlations for the music majors on personality variables are to the lower left of the diagonal line.

Correlations for nonmajors are located to the upper right of the diagonal line.

* $p < .05$, ** $p < .001$

Table 6

Correlations for Male Music Majors (n = 126) and Nonmajors (n = 140)

Variable	1	2	3	4	5	6	7	8	9
1 BULIT-R	---	.34**	.27**	.30**	-.04	.15*	.24**	.37**	.17*
2 BMI	.35**	---	-.14	.01	.03	-.03	-.02	-.10	-.09
3 FROST-DA	.30**	-.06	---	.68**	.14*	.25**	.48**	.64**	.25**
4 FROST-CM	.38**	-.03	.68**	---	.52**	.50**	.56**	.54**	.06
5 FROST-PS	.153	-.02	.40**	.53**	---	.49**	.23**	.06	.00
6 FROST-PE	.26*	.12	.376**	.41**	.49**	---	.60**	.18*	.03
7 FROST-PC	.33**	.05	.49**	.54**	.39**	.65**	---	.53**	.22**
8 NEO	.32**	.02	.57**	.55**	.06	.15*	.37**	---	.28**
9 AIMS	.04	.12	.16*	.13	.36**	.36**	.18*	-.05	---

Note. Correlations for the music majors on personality variables are to the lower left of the diagonal line. Correlations for nonmajors are located to the upper right of the diagonal line.

* $p < .05$, ** $p < .001$

Table 7

*Hierarchical Multiple Regression Analyses Predicting Bulimic Symptomatology -**Female Music Majors (n = 93)*

Step/Predictor	Adjusted R^2	ΔR^2	ΔF	B	$SE B$	β	t
Step 1	.05	.06	5.593*				
Body Mass Index				0.87	0.37	0.24	2.37*
Step 2	.16	.18	2.78*				
Body Mass Index				0.89	0.36	0.25	2.50*
Doubts about Action				4.21	2.05	0.29	2.05*
Concern over Mistakes				0.83	2.47	0.05	0.34
Personal Standards				-0.77	2.30	-0.05	-0.34
Parental Expectations				-2.12	2.31	-0.13	-0.92
Parental Concern				-2.08	2.26	-0.13	-0.92
NEO				0.40	0.19	0.24	2.09*
AIMS				-0.38	0.26	-0.17	-1.43

Full Model $R^2 = .24$, Overall $F(8, 93) = 3.23^{**}$

Note: The ΔF -test is for each step of the model and the Overall F -test is for the final step of the model when all variables had been entered. Degrees of freedom corresponding to ΔF are 1, 91 for Step 1 and 7, 84 for Step 2. The Bulimia Test-Revised (BULIT-R) was used to measure the criterion variable of bulimic symptomatology. Body Mass Index is represented in kg./meters². Doubts about Action, Concern over Mistakes, Personal Standards, Parental Expectations, and Parental Concern are scales of the Frost Multidimensional Perfectionism Scale. NEO consists of the Neuroticism scale of the NEO-Five Factor Inventory. AIMS is the Athletic Identity Measurement Scale modified to assess for musician identity.

* $p < .05$, ** $p < .01$

Table 8

*Hierarchical Multiple Regression Analyses Predicting Bulimic Symptomatology -**Female Nonmajors (n = 309)*

Step/Predictor	Adjusted R^2	ΔR^2	ΔF	B	$SE B$	β	t
Step 1	0.05	0.05	15.40**				
Body Mass Index				0.80	0.20	0.22	3.92**
Step 2	0.29	0.26	16.38**				
Body Mass Index				0.69	0.18	0.19	3.89**
Doubts about Action				2.43	1.69	0.11	1.44
Concern over Mistakes				5.19	1.96	0.23	2.64*
Personal Standards				0.30	1.66	0.00	0.19
Parental Expectations				-0.19	1.36	-0.01	-0.14
Parental Concern				-1.18	1.42	-0.06	-0.83
NEO				0.51	0.18	0.28	4.36**
AIMS				0.06	0.21	0.06	0.30
Full Model $R^2 = .31$, Overall $F(8, 309) = 16.93**$							

Note: The ΔF -test is for each step of the model and the Overall F -test is for the final step of the model when all variables had been entered. Degrees of freedom corresponding to ΔF are 1, 307 for Step 1 and 7, 164 for Step 2. The Bulimia Test-Revised (BULIT-R) was used to measure the criterion variable of bulimic symptomatology. Body Mass Index is represented in kg./meters². Doubts about Action, Concern over Mistakes, Personal Standards, Parental Expectations, and Parental Concern are scales of the Frost Multidimensional Perfectionism Scale. NEO consists of the Neuroticism scale of the NEO-Five Factor Inventory. AIMS is the Athletic Identity Measurement Scale modified to assess for musician identity.

* $p < .01$, ** $p < .001$

Table 9

*Hierarchical Multiple Regression Analyses Predicting Bulimic Symptomatology -**Male Music Majors (n = 126)*

Step/Predictor	Adjusted R^2	ΔR^2	ΔF	B	$SE B$	β	t
Step 1	0.12	0.12	17.56**				
Body Mass Index				1.06	0.25	0.35	4.20**
Step 2	0.26	0.19	4.53**				
Body Mass Index				1.06	0.24	0.35	4.48**
Doubts about Action				0.94	1.63	0.06	0.55
Concern over Mistakes				4.37	1.88	0.29	2.32*
Personal Standards				-2.00	1.70	-0.12	-1.18
Parental Expectations				1.11	1.78	0.07	0.62
Parental Concern				1.57	1.68	0.11	0.94
NEO				0.91	0.15	0.07	0.53
AIMS				-0.11	0.20	-0.04	-0.52

Full Model $R^2 = .31$, Overall $F(8, 126) = 6.601^{**}$

Note: The ΔF -test is for each step of the model and the Overall F -test is for the final step of the model when all variables had been entered. Degrees of freedom corresponding to ΔF are 1, 124 for Step 1 and 7, 117 for Step 2. The Bulimia Test-Revised (BULIT-R) was used to measure the criterion variable of bulimic symptomatology. Body Mass Index is represented in kg./meters². Doubts about Action, Concern over Mistakes, Personal Standards, Parental Expectations, and Parental Concern are scales of the Frost Multidimensional Perfectionism Scale. NEO consists of the Neuroticism scale of the NEO-Five Factor Inventory. AIMS is the Athletic Identity Measurement Scale modified to assess for musician identity

* $p < .05$, ** $p < .001$

Table 10

*Hierarchical Multiple Regression Analyses Predicting Bulimic Symptomatology -**Male Nonmajors (n = 140)*

Step/Predictor	Adjusted R^2	ΔR^2	ΔF	B	$SE B$	β	t
Step 1	0.11	0.12	18.02**				
Body Mass Index				1.04	0.24	0.34	4.25**
Step 2	0.30	0.23	6.49**				
Body Mass Index				1.18	0.22	0.39	5.32**
Doubts about Action				-0.46	1.91	-0.27	-0.24
Concern over Mistakes				4.76	2.37	0.26	1.99*
Personal Standards				-5.34	1.97	-0.26	-2.71*
Parental Expectations				3.13	1.78	0.18	1.76
Parental Concern				-2.12	1.87	-0.12	-1.14
NEO				0.39	0.13	0.30	2.88*
AIMS				0.43	0.25	0.13	1.74
Full Model $R^2 = 0.34$, Overall $F(8, 140) = 8.56^{**}$							

Note: The ΔF -test is for each step of the model and the Overall F -test is for the final step of the model when all variables had been entered. Degrees of freedom corresponding to ΔF are 1, 138 for Step 1 and 7, 131 for Step 2. The Bulimia Test-Revised (BULIT-R) was used to measure the criterion variable of bulimic symptomatology. Body Mass Index is represented in kg./meters². Doubts about Action, Concern over Mistakes, Personal Standards, Parental Expectations, and Parental Concern are scales of the Frost Multidimensional Perfectionism Scale. NEO consists of the Neuroticism scale of the NEO-Five Factor Inventory. AIMS is the Athletic Identity Measurement Scale modified to assess for musician identity

* $p < .05$, ** $p < .001$

APPENDIX A
DEMOGRAPHICS QUESTIONNAIRE

1. Present height: _____ feet _____ inches
2. Present weight: _____ pounds
3. Are you satisfied with your current weight? ____ Yes ____ No
 - a. If NO, do you consider yourself to be: ____ overweight ____ underweight
4. Ideal weight: _____ pounds
5. Have you ever been diagnosed or treated for:
 - anorexia nervosa? ____ Yes ____ No (If YES, indicate when _____)
 - bulimia nervosa? ____ Yes ____ No (If YES, indicate when _____)
 - Other Eating Disorder ____ Yes ____ No

(If YES, please indicate what disorder _____)

Menstrual History (FEMALES ONLY)

1. Have you ever had a menstrual period? ____ Yes ____ No
 - a. If YES, how old were you when you had your first menstrual period? _____
2. How many menstrual cycles have you had in the past 12 months? _____
3. During the past 12 months, have you used hormone-based methods of birth control, such as oral contraceptives, patch, Nuvaring, Norplant, or shots. ____ Yes ____ No

If YES, please specify type: _____

If YES, please specify when used in the last 12 months: _____

If YES, please indicate the effect it has had on your menstrual cycle.

4. I have missed at least 3 consecutive menstrual cycles (not including those missed during a pregnancy). ____ YES ____ NO
 - a. If YES, how old were you when you missed 3 or more periods? _____
 - b. If YES, how long did you go (e.g., months) without having a period? _____
 - c. If YES, did you see a physician? ____ Yes ____ No
 - d. If YES, what was the diagnosis and treatment? _____

Background Information

1. What is your biological sex? Male Female

2. What is your age (in years) : _____

3. What is your current G.P.A.: _____

4. What is your current Academic Status: Freshman Sophomore Junior
 Senior 5th Year Master's Student Doctoral Student

5. What gender do you identify with? Male Female Transgender

6. How would you best describe your sexual orientation?
 Gay
 Lesbian
 Bisexual
 Heterosexual
 Asexual

7. Are you sexually attracted to
 Men
 Women
 Both
 Neither

8. Are you of Hispanic, Latino, or Spanish origin?
 No
 Yes, Mexican, Mexican Am., Chicano
 Yes Puerto Rican
 Yes, Cuban
 Yes, other Hispanic, Latino, or Spanish origin

9. What is your race?
 White
 Black, African American, Negro
 American Indian or Alaska Native
 Asian Indian
 Chinese
 Phillipino
 Other Asian
 Japanese
 Korean
 Vietnamese
 Native Hawaiian
 Guamanian or Chamorro
 Samoan
 Other Pacific Islander

10. What is your country of origin? _____

6. Were your parents, or primary caregivers growing up, musicians?

Yes

No

7. What income bracket best describes the household that you were raised in?

\$0- \$24,999

\$25,000- \$49,999

\$50,000- \$74,999

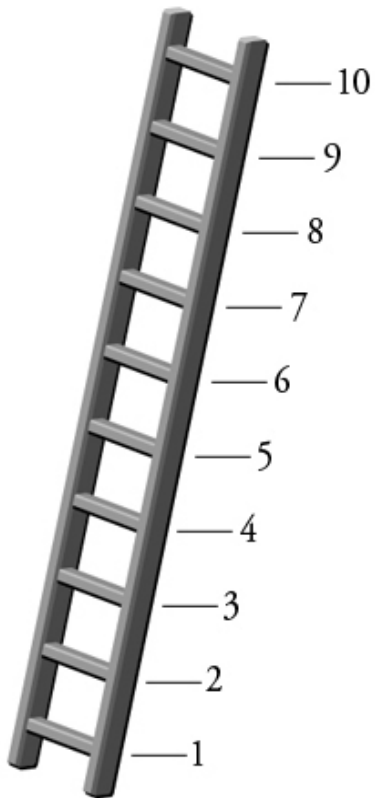
\$75,000- \$99,999

\$100,000- \$149,999

\$150,000- \$199,999

\$200,000+

8. Please use the ladder below to answer questions 13a and 13b.



13a. Imagine that this ladder pictures how American society is set up.

- At the top of the ladder are the people who are the best off – they have the most money, the highest amount of schooling, and the jobs that bring the most respect.
- At the bottom are people who are the worst off- they have the least money, little or no education, no job or jobs that no one wants or respects.

Now think about your family. Please tell us where you think YOUR FAMILY would be on this ladder. **Indicate the number corresponding with the rung that best represents where your family would be on this ladder.** _____

13b. Now assume that the ladder is a way of picturing your school.

- At the top of the ladder are the people in your school with the most respect, the highest grades, and the highest standing.
- At the bottom are the people who no one respects, no one wants to hang around with, and have the worst grades.

Where would you place yourself on this ladder? **Please indicate the number corresponding with the rung you see yourself on.** _____

Musicians

1. Are you a student in the College of Music at UNT (currently majoring or plan to major in music)? ___Yes ___No
2. Please select the category best describing your major:
____ Music Performance - Keyboard
____ Music Performance - Instrumental
____ Music Performance - Vocal
____ Music Performance - Conducting
____ Jazz Studies
____ Music Education
____ Other (Please describe) _____
____ Undecided
3. What is your primary instrument? _____
What is your secondary instrument? _____
What is your tertiary instrument? _____
4. At what age did you start playing an instrument? _____ years
5. At what age did you begin taking private music lessons? _____ years or N/A
6. At what age did you decide to major in music and/or select music for your career? _____
7. Following graduation, what percentage of time during a typical work week (i.e., 40 hours) do you believe you will spend in music-related work? _____

8. Following graduation, what percentage of your annual income do you expect to come from music-related work? _____
9. Do you play in an ensemble at UNT? ___ Yes ___ No
10. How many ensembles at UNT are you currently in? _____
11. What school ensembles are you currently in? _____
12. Have you ever worked as a music professional (defined as making money for performing) or music teacher? ___ Yes ___ No
13. Are you currently working as a music professional or music teacher? ___ Yes ___ No
14. Over the past year, in an average month, how many times do you get paid to work as a musician or music teacher? _____
15. Please describe your current work as a musician or music teacher.
-

APPENDIX B
INFORMED CONSENT FOR MUSIC MAJORS

University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits, and risks of the study and how it will be conducted.

Title of Study: Physical and Psychological Health of College Music Majors and Nonmusic Majors

Principal Investigator: Trent Petrie, Ph.D. University of North Texas (UNT) Department of Psychology

Key Personnel: Laura DiPasquale, M.S., doctoral student in the University of North Texas (UNT) Department of Psychology

Purpose of the Study: You are being asked to participate in a research study that involves understanding the relationship between psychological and environmental variables and the health behaviors of college students who are music majors and those who are majoring in a different academic discipline.

Study Procedures: You will be asked to complete online questionnaires that will take about 20 minutes of your time. No follow-up is required.

Foreseeable Risks: The potential risks involved in this study are minimal, though you will be asked questions about your current and past physical health and psychological well-being that may be sensitive. At the end of the study, the researchers will provide you with a list of on-campus resources should you want to discuss any issues or topics that are covered during your participation in the study.

Benefits to the Subjects or Others: Your participation in this study may contribute to the field of psychology by allowing professionals to understand the psychological health of college students and determine which specific factors best predict their physical health and psychological well-being.

Compensation for Participants: You may choose to enter your name into a drawing of approximately 250 students for one of five \$50.00 cash prizes.

Procedures for Maintaining Confidentiality of Research Records: The researcher will act to protect your confidentiality as a participant of this project. As such, you will provide no identifying information, such as your name, on the questionnaires themselves. Your responses will be identified only through code number. The only place where you will provide identifying information is on the final page at the end of the study and that will occur only if you choose to enter yourself into the drawing for one of the cash prizes. On that page you will provide your name and email address so we may notify you if you are selected as a winner of one of the \$50.00 cash prizes. Your name and email will not be associated with the answers you provide on

the questionnaires. Also, data from this study will be published or presented in aggregate form only, which means that no individual data will be disclosed.

Questions about the Study: If you have any questions about the study, you may contact Laura DiPasquale at telephone number (940) 565-2631 or Dr. Trent Petrie, Ph.D., UNT Department of Psychology, at telephone number (940) 565-2671.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Research Participants' Rights: Clicking the "I Agree" button below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- The study has been explained to you and you have had the opportunity to ask questions.
- You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- Please print this consent notice for your records.

APPENDIX C
INFORMED CONSENT FOR NONMAJORS

University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits, and risks of the study and how it will be conducted.

Title of Study: Physical and Psychological Health of College Music Majors and Nonmusic Majors

Principal Investigator: Trent Petrie, Ph.D. University of North Texas (UNT) Department of Psychology

Key Personnel: Laura DiPasquale, M.S., doctoral student in the University of North Texas (UNT) Department of Psychology

Purpose of the Study: You are being asked to participate in a research study that involves understanding the relationship between psychological and environmental variables and the health behaviors of college students who are music majors and those who are majoring in a different academic discipline.

Study Procedures: You will be asked to complete online questionnaires that will take about 20 minutes of your time. No follow-up is required.

Foreseeable Risks: The potential risks involved in this study are minimal, though you will be asked questions about your current and past physical health and psychological well-being that may be sensitive. At the end of the study, the researchers will provide you with a list of on-campus resources should you want to discuss any issues or topics that are covered during your participation in the study.

Benefits to the Subjects or Others: Your participation in this study may contribute to the field of psychology by allowing professionals to understand the psychological health of college students and determine which specific factors best predict their physical health and psychological well-being.

Compensation for Participants: If your class participates in SONA (the UNT Psychology Departments research participant pool), you will receive one SONA credit for your participation in this study. If you chose not to participate in research studies through SONA to receive extra credit or meet your course requirements (whichever is applicable to your course), your course instructor will provide you with a non-research alternative to receive equivalent credit.

Procedures for Maintaining Confidentiality of Research Records: The researcher will act to protect your confidentiality as a participant of this project. As such, you will provide no identifying information, such as your name, on the questionnaires themselves. Your responses will be identified only through code number. The only place where you will provide identifying information is on the final page, at the end of the study, and that will occur only if you would

like to receive SONA credit for participating in the study. Your name and email will not be associated with the answers you provide on the questionnaires. Also, data from this study will be published or presented in aggregate form only, which means that no individual data will be disclosed.

Questions about the Study: If you have any questions about the study, you may contact Laura DiPasquale at telephone number (940) 565-2631 or Dr. Trent Petrie, Ph.D., UNT Department of Psychology, at telephone number (940) 565-2671.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Research Participants' Rights: Clicking the "I Agree" button below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- The study has been explained to you and you have had the opportunity to ask questions.
- You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- Please print this consent notice for your records.

APPENDIX D
DISSERTATION PROPOSAL

Chapter 1

Review of Literature

Eating Disorders

Clinical eating disorders are psychiatric disorders that consist of disturbances in eating patterns and preoccupation with weight and physical appearance. There are three diagnostic categories of clinical eating disorders based on the Diagnostic and Statistical Manual for Mental Disorders, text revision (DSM-IV-TR; American Psychiatric Association [APA], 2000): anorexia nervosa, bulimia nervosa, and eating disorder not otherwise specified (EDNOS). In addition to these diagnostic categories, many individuals experience levels of eating pathology that are subclinical in nature. Eating disorders can damage the body physically (e.g., cause a loss in bone mineral density, gastric difficulties, cardiac failure) and have potentially life-threatening consequences. Crude mortality rates, (including eating disorder related suicide, substance abuse, traumatic causes, and medical causes), of 4% for anorexia nervosa, 3.9% for bulimia nervosa, and 5.2% for EDNOS have been found (Crow et al., 2009).

Anorexia nervosa. Anorexia nervosa is defined by a refusal to maintain normal body weight (i.e., below 85% of what is medically expected), intense fears of weight gain or being fat, disturbance in the perception of one's size, shape, or weight, and amenorrhea (APA, 2000). A central feature of anorexia nervosa is a focus on weight and physical appearance. Other features commonly associated with the disorder include depression, anxiety, social isolation, insomnia, perfectionism, obsessive-compulsiveness, restraint of emotional expression, and low self-esteem (APA; Beals, 2004). Impulsivity, including substance abuse and suicide attempts, also can be related to anorexia nervosa, particularly in conjunction with binge eating (APA).

Bulimia nervosa. The diagnostic characteristics of bulimia nervosa are (a) recurrent episodes of binge eating, with a binge being defined as consuming significantly more food during a discrete period of time than most people and a loss of control over eating during the given time period, (b) recurrent compensatory behaviors, such as vomiting, laxatives, diuretics, fasting or excessive exercise, following the binge to prevent weight gain, and (c) excessive focus on body weight and shape (APA, 2000). Like anorexia nervosa, body size and physical appearance are primary associated features. Individuals with bulimia nervosa also may experience depression, anxiety, shame, difficulties with substance abuse, lack of control, impulsivity, social isolation, and low self-esteem (APA; Beals, 2004).

Eating disorder not otherwise specified (EDNOS). EDNOS is a clinical diagnosis that is given when most, but not all, of the criteria for anorexia nervosa or bulimia nervosa are met. Some examples of EDNOS are a woman who meets criteria for anorexia nervosa, but still has regular menses, or when bingeing and purging occur less frequently than required for a bulimia nervosa diagnosis. The diagnosis of EDNOS also may be given when behaviors that do not fit into either anorexia nervosa or bulimia nervosa occur, such as chewing food, then spitting it out. Binge-eating disorder (BED), which is comprised of recurrent episodes of binge eating without the use of compensatory purging behaviors, is also given an EDNOS diagnosis (Mintz, O'Halloran Mulholland, & Schneider, 1997), as there was insufficient information to consider BED as a separate diagnosis at the time the DSM-IV-TR was published (APA, 2000).

Orthorexia is a term referring to an obsession with healthy food, which can lead to malnutrition and low weight. This “new” eating disorder, which initially emerged from popular media, is now being given attention from professionals in the field of eating disorders (Vandereycken, 2011), as researchers are attempting to create diagnostic criteria and develop

measures for the construct (Ramacciotti et al., 2011). In a study surveying professionals specializing in eating disorders, 67% indicated that they have observed the construct of orthorexia in their practice and 69% indicated that the disorder deserved more attention from the field (Vandereycken). Although orthorexia is a new way of conceptualizing issues with food, preliminary evidence suggests that this disorder requires more attention. As BED initially was placed into the broad category of EDNOS, this likely would be the place for orthorexia.

Subclinical eating disorders. Research supports the notion that disordered eating exists on a continuum (Affentio, 2003) and can range from limiting food groups and restricting caloric intake, to occasional bingeing and purging, to meeting the diagnostic criteria for anorexia or bulimia (Beals & Manore, 1999). The term subclinical (or symptomatic) is used to refer to eating disturbances that do not meet DSM-IV-TR criteria for any of the diagnostic categories previously described, but where marked disturbances in eating still are present (Affentio; Beals & Manore; Thompson & Sherman, 1993). Clinical and subclinical eating disorders are best differentiated by frequency and severity of symptoms, whereas the two groups often are similar in terms of the level/presence of psychosocial correlates. For example, Cohen and Petrie (2005) found that participants categorized as having clinical and subclinical eating disorders reported similar levels of psychological distress, particularly with respect to sadness/depression guilt, shame, and stress. On cognitive variables of vulnerability and catastrophizing, and internalization of sociocultural attitudes about attractiveness and appearance, the two groups also did not differ significantly from one another. However, the clinical eating disorder group reported significantly greater disturbances on actual measures of eating pathology (i.e., bulimic symptoms, concern for dieting, weight fluctuation) than the symptomatic group. Based on the findings of Cohen and Petrie, along with other studies (e.g., Beals & Manore; Tylka & Subich,

2003), subclinical and clinical eating disorders appear to be more similar than different, with differences primarily being in the severity and/or frequency of specific symptoms.

Eating Disorder Prevalence and At-Risk Populations

Only a few studies have included population based samples when determining prevalence rates for eating disorders. For example, Hudson, Hiripi, Pope, and Kessler (2007) reported 12-month, point prevalence rates for adults in the United States of: (a) .5% for women and .1% for men for bulimia nervosa; (b) 1.6% for women and .8% for men for binge eating disorder; (c) .4% for women and .8% for men for subclinical bulimia nervosa and; (d) 0% for women and men for anorexia nervosa. Lifetime rates for women and men were .9% and .3% respectively for anorexia nervosa and 1.5% and .5% for bulimia nervosa. Although this study was rigorous in its methodology, the participants were initially screened for other Axis I disorders and included in the sample if they met criteria for another disorder. Therefore these findings may better reflect eating disorder comorbidity rates, rather than true prevalence rates.

Other researchers have summarized findings from studies on eating disorder prevalence rates. For example, Makino, Tsuboi, and Dannerstein (2004) examined both population-based and clinic-based studies and reported a range of eating disorder prevalence rates in women between .1% and 5.7% for anorexia nervosa and .3% and 7.3% for bulimia nervosa; higher rates were from hospital-based studies. Hock & van Hoeken (2003) only included studies utilizing strict diagnostic criteria in their review and reported lifetime anorexia nervosa prevalence rates of 1% for women and .1% for men.

College students are a subgroup of adults that are thought to be at an increased risk for eating disorders (O'Dea & Abraham, 2002; Striegel-Moore, Silberstein, & Rodin, 1986). There

are a variety of factors thought to contribute to the increased prevalence of eating disorders in college students, including high perceived stress, increased feelings of ineffectiveness, negative feelings about weight, high levels of competitiveness, pressure to date and find a partner, and increased sociocultural pressures to look a certain way (Striegel-Moore, Silberstein, French, & Rodin, 1989; Striegel-Moore et al., 1986). Additionally, it is reported that middle to upper-class individuals are at higher risk for the development of eating disorders (Striegel-Moore & Bulik, 2007). Given that college students often come from higher socio-economic backgrounds, the risk for developing eating disorders might be increased due to this factor (Striegel-Moore et al., 1986).

With respect to actual prevalence rates, Hudson et al. 2007 found both women and men ages 18-29 had a greater prevalence rate of bulimia nervosa and BED than those who were older. Regarding anorexia nervosa, age of onset was slightly earlier than it was for bulimia nervosa and BED, but no participants developed anorexia nervosa beyond the mid-20's. To determine prevalence rates among college-aged women, Favaro, Ferrara, and Santonastasio (2004) administered clinical interviews to 934 Italian women ages 18-25 solicited from voting registries. Point and lifetime prevalence rates, respectively, of .39% and 2% were found for anorexia nervosa, and 1.8% and 4.6% for bulimia nervosa. Additionally, the researchers reported point prevalence rates of .77% and 2.4% for subclinical anorexia nervosa and subclinical bulimia nervosa, respectively. Using the Questionnaire for Eating Disorder Diagnosis (QEDD; Mintz et al., 1997) to determine eating disorder diagnosis in a sample of college women from the United States, Cohen and Petrie (2007) found that 51.5% could be classified as asymptomatic, 38.9% symptomatic, and 9.6% eating disordered. In a sample of high school and college men from the United States, Tylka and Stubich (2002a) reported prevalence rates of 51% (asymptomatic), 37%

(symptomatic), and 12% (eating disordered) when using the QEDD. Among college students, rates for bulimia nervosa are higher than anorexia nervosa and overall rates for eating disorders are higher in college students than in the general population (Favaro et al.; Hudson et al.).

Certain groups of college students, such as athletes and sorority members (Basow, Foran, & Bookwala, 2007; Smolak, Murnen, & Ruble, 2000), may be at even greater risk than other college students for developing eating disorders because of factors unique to the environments in which they reside and participate. For example, Basow et al. found higher levels of body surveillance and body shame, along with higher scores on subscales of the EDI among sorority women than non-sorority women. It was suggested that the increased risk among sorority women was due to the appearance focused environment of sororities, noting that most live within a sorority house and therefore are constantly exposed to social pressures to look a certain way.

Athletes may be at increased risk for eating disorders due to experiencing unique pressures within the sport environment, such as subjective judging criteria, “making weight” in sports with body weight classes, coach expectations or pressure to lose weight, and wearing tight or revealing uniforms (Petrie & Greenleaf, 2007). For example, higher rates of eating disorder symptomatology have been reported in sports where a lean body type is preferable (Petrie, 1996) and in judged sports, compared to refereed sports or nonathletes (Zucker, Womble, Williamson, & Perrin, 1999). Personality traits also may increase athletes’ risk for developing an eating disorder. Thompson and Sherman (1999) have suggested that some of the traits needed to succeed in athletics, such as persistence, perfectionism, drive for excellence, commitment, and selflessness, are ones that are found in individuals with eating disorders. Thus, for athletes, pressures within the sport environment as well as personality factors may act independently, or in combination, to increase body dissatisfaction and/or lead them to adopt pathogenic weight

control behaviors, such as excessive exercising and dieting, which may be an immediate precursor to developing an eating disorder (Petrie & Greenleaf).

Musicians are a subgroup that may be at an elevated risk for the development of eating disorders because of unique sociocultural pressures within the music environment and personality factors that are common within this high-achieving group. However, research examining musicians has been somewhat limited and equivocal. From a sociocultural perspective, certain musicians, such as vocalists, soloists and those with prominent roles in orchestras, may experience pressure to attain a specific physical look or appearance because the visual aspect of music performance is important to audiences and judges (Griffiths, 2010). Research has indicated an attractiveness bias exists for musicians (Ryan, Wapnick, Lacaille, & Darrow, 2006), which suggests musicians style of dress (Griffiths) and overall appearance (Ryan et al.) effect how their performances are perceived and evaluated. More attractive male and female singers (Wapnick, Darrow, Kovacs, & Dalrymple, 1997) and physically more appealing female violinists (Wapnick, Mazza, & Darrow, 1998) received superior performance ratings in comparison to those who were judged to be less attractive. Among pianists, a positive attractiveness bias has been shown to exist among college and novice performers, but not among professional performers (Ryan et al.). These findings suggest that music is a sub-culture where appearance is related to success and musicians may feel pressure to change their bodies and appearance to achieve at the highest level possible.

It is also the personality characteristics that are common among musicians that may be the reason for their elevated risk for eating disorders. The music environment is highly competitive (Lacaille, Koestner, & Gaudreau, 2007) and therefore in order to succeed, music majors must be hard working, highly motivated and goal-directed, emotional, focused on details

and perfectionistic, and independent (Brodsky, 2006; Kemp, 1996; Langerdorfer, Hodapp, Kreutz, & Bongard, 2006). These traits bear a striking resemblance to those found amongst women with eating disorders (Thompson & Sherman, 1999). The big five personality traits of neuroticism, extraversion, openness, agreeableness, and conscientiousness (Costa & McCrae, 1992) also have been examined in musicians (Gillespie & Myors, 2000; Kemp, 1981). High levels of neuroticism are typically reported, which is consistent with findings in eating disorder samples. Although some research has reported that college musicians experience high levels of positive affect and self-esteem (Chesky & Hipple, 1999; Kreutz, Ginsborg, & Williamon, 2009), others studies have found musicians to be at an elevated risk for substance abuse (Willis, 2003) and to struggle with stress, anxiety, and depression (Onder, Cosar Oztas, & Candansayar, 2000; Parasuraman & Purohit, 1999; Raeburn, 2000; Willis). The conflicting findings between studies may be a function of music style performed (e.g., classical vs. popular music) and level of participation (e.g., novice vs. college vs. professional), however studies do indicate some risk of mental health difficulties among musicians (Willis). The cormorbidity that often exists between eating disorders and substance abuse, anxiety, and depression (APA, 2000) provides additional support for the idea that musicians may be at increased risk. Despite the sociocultural and personality variables that would put musicians, particularly college age, at an increased risk for the development of eating disorders, I could locate only one study that has investigated prevalence in this population, which supports the need for further research in this area. Specifically, in a sample of female and male opera singers, ballet dancers, and symphony orchestra players, Aksoydan and Camci (2009) examined the prevalence of orthorexia nervosa. They found 81.8% of opera singers and 36.4% of symphony orchestra musicians met the criteria

for this disorder in comparison to 57.6% in a normative sample of female and male adults from the general population (Ramacciotti et al., 2011).

Musicians are a broad and diverse group of artists who different subgroups, such as instrumentalists, vocalists, composers, and conductors. There also are different genres of music and various roles within each music group. For example, in a symphony orchestra, brass players often have prominent parts, such as solos, and therefore must be attuned to cues and accurate with their first note, whereas string players play more as a group, performing consistently throughout a performance and ensuring accuracy and homogeneity of sound (Langendorfer, 2008). Because of the different demands and roles that exist, personalities may vary across different instrument groups (Langendorfer) and music genres (Gillespie & Myors, 2000; Kemp, 1981). Thus, eating disorder risk may vary as well across these groups.

Development of Eating Disorders

The development of eating disorders is a multidimensional process with many contributing factors (Striegel-Moore, Silberstein, & Rodin, 1986). The integrative biopsychosocial model considers the interaction of biology, sociocultural factors, and psychological variables (Engel, 1992) in the development of mental illness and is frequently used to understand risk factors in eating disorders.

Giving the emphasis on appearance within eating disorders, sociocultural factors have been seen central to the etiology of eating disorders (Striegel-Moore & Bulik, 2007). The sociocultural perspective suggests that industrialized, Western societies emphasize physical appearance, particularly thinness, in determining women's attractiveness, beauty, and worth. This "thin idea" is communicated not only through media outlets, such as magazines, movies, and

TV, but also through family members and friends; all of these sources may encourage women to change their bodies to conform to society's expectations (Brownell, 1991). When such pressures and messages are internalized, that is taken on as a self-schema to which women compare their bodies, dissatisfaction with appearance, body size and shape, and self may result because these standards are unrealistic for most women (Stice, 2001). Body dissatisfaction can lead to dieting as a punitive weight control technique or negative affect because of the negative evaluation associated with not achieving the thin ideal (Stice, 2002). Thus, the more societal standards are internalized, the greater risk a woman has for body dissatisfaction, dieting, negative affect, and disordered eating (Stice, 2001, 2002; Striegel-Moore & Bulik; Striegel-Moore et al., 1986).

Historically, the sociocultural perspective has applied to women, yet over the last three decades the societal ideal has changed for men and it has been applied to them as well. For men, the body ideal includes the dimensions of leanness and muscularity, a hypermesomorphic body type that represents youth, physicality, vigor, health, energy, and happiness (Furnham, Badmin, & Sneade, 2002). As men have become more focused on their bodies and realized that they too fall short of the societal ideal, they are experiencing many of the same negative outcomes as women have, such as body dissatisfaction, negative affect, and disordered eating (Leit, Gray, & Pope, 2002; Soban, 2006).

Sociocultural pressures are ubiquitous so, to varying degrees, all men and women are considered to be at-risk for body dissatisfaction and disordered eating attitudes and behaviors. Therefore, considering the biological and psychological factors helps us to understand why some men and women are inflicted with eating disorders while others are not. In regards to biology, genetic factors are considered to make certain individuals more susceptible to the development of eating disorders, however the exact mechanism remains unknown (Striegel-Moore & Bulik,

2007). Psychological factors consist of an individual's perceptions, emotions, reactions, mental state, and personality (Engel, 1992; Striegel-Moore et al., 1986, Vitousek & Manke, 1994).

Within eating disorders, it has been suggested that certain personality factors may increase individuals' risk in the development of eating disorders. Anorexic and bulimic "personality profiles" have been identified and research has shown that individuals who score high in these characteristics generally report more disordered eating (Vitousek & Manke). Generally speaking, individuals with anorexia nervosa have been described as rigid and overcontrolled, often displaying cluster C traits of personality disorders (i.e., avoidant, dependent, and obsessive-compulsive; Rosenvinge, Martinussen, & Ostensen, 2000). Individuals with bulimia nervosa often display poor impulse control and interpersonal difficulties, with traits of cluster B personality disorders (i.e., antisocial, borderline, histrionic, and narcissistic; Rosenvinge et al.).

Given that all men and women in Western societies are exposed to the societal ideal, yet not everyone develops an eating disorder, it is important to consider how certain personality traits may be related to the experience of disordered eating attitudes and behaviors. In the sections that follow, I will describe personality variables that are common in eating disorders and musicians, discuss their presence in eating disorders and musicians, and describe how musicians may be at an increased risk for the development of eating disorders based on the presence of these key personality traits.

Personality, Musicians, and Eating Disorders

Perfectionism. Perfectionism is a personality trait characterized by setting excessively high personal standards across situations, allowing little leeway for mistakes, and being highly critical of one's self and performances (Frost, Marten, Lahart, & Rosenblate, 1990). Recent

conceptualizations of perfectionism suggest that it is a multidimensional construct, including high expectations of others, high personal standards, placing high demands on others, organization, and self-doubt (Frost, et al.; Hewitt & Flett, 1991; Pearson & Gleaves, 2006).

Given the self-criticism and negative self-evaluation found in people who are perfectionistic, higher levels of perfectionism have been associated with lower levels of psychological well-being and higher levels of stress (Chang, 2006), as well as various psychological disorders (Frost et al., 1990; Hewitt, Flett, & Ediger, 1996). For example, Frost et al. found that the concern over mistakes and doubting of actions subscales of a perfectionism measure were associated strongly with negative psychological symptoms including depression and anxiety. Hewitt et al. found participants high in self-oriented perfectionism (defined as holding extremely high self-imposed standards) had an increase in symptoms of depression when faced with stressful achievement events, whereas socially prescribed perfectionism (defined as striving to meet excessively high standards and expectations defined by others) directly predicted depressive symptoms. These findings indicate that holding high standards, whether originating from within the person or from others in the environment, can lead to negative affective responses. Therefore, it is not surprising that perfectionism has been linked to disordered eating (Frost et al., 1990), in part because of how pressure, from the self or others, to obtain a “perfect body” may increase body dissatisfaction and decrease self-esteem (Pearson & Gleaves, 2006).

Perfectionism has been linked to disordered eating (Frost et al., 1990), in part because of how pressure, from the self or others, to obtain a “perfect body” may increase body dissatisfaction, which is a primary precursor of disordered eating (Stice, 2002). Studies reviewing risk factors and correlates of eating disorders have found perfectionism to be related to symptoms of anorexia nervosa, bulimia nervosa, and BED (Jacobi, Hayward, de Zwaan,

Kraemer, & Agras, 2004; Stice, 2002), particularly when it is conceptualized multidimensionally (Bardone-Cone et. al, 2007). For example, in a sample of female patients with anorexia nervosa and healthy controls, Bastiani, Rao, Weltzin, and Kaye (1995) found underweight anorexic patients scored significantly higher on dimensions of concern over mistakes, personal standards, parental criticism, doubts about actions, organization, self-oriented perfectionism, and socially prescribed perfectionism than healthy controls. College women with elevated scores on concerns over mistakes, parental expectations, and doubts about action also had higher levels of neurotic perfectionism, which was related to bulimic behaviors (Pearson & Gleaves, 2006). Similarly, Chang, Ivezaj, Downey, Kashima, and Morady (2008) found parental expectations and concern over mistakes best predicted bulimic symptoms in their sample of college women. A sample of adult women with anorexia nervosa was found to have significantly higher levels of self-oriented and socially-prescribed perfectionism than a control group of adult women with no history of anorexia nervosa (Cockell et al., 2002). Additionally, in a sample of obese women with BED, participants scored significantly higher on self-oriented perfectionism than did controls (Pratt, Telch, Labouvie, Wilson, & Agras, 2001).

Although certain dimensions of perfectionism, such as self-oriented and socially prescribed perfectionism, may be related to different types of disordered eating, it may have an even stronger influence as a moderator of the body dissatisfaction – disordered eating relationship (Stice, 2001). For example, Brannan and Petrie (2008) found that socially prescribed perfectionism moderated the relationship between body dissatisfaction and bulimic symptomatology, whereas self-oriented perfectionism moderated the body dissatisfaction – anorexic symptomatology relationship. Brannan and Petrie hypothesized that the relationship between self-oriented perfectionism and anorexic symptomatology exists as a way for body

dissatisfied women to focus on what is controllable as they strive to meet the societal ideal. The relationship between socially prescribed perfectionism and bulimic symptomatology was hypothesized to exist as a way to meet the standards of others, but without having the rigid self-restraint to maintain a strict diet, individuals purge as a way to ameliorate guilt. These studies (e.g., Bastiani et al., 1995; Brannan & Petrie) suggest that perfectionism, whether examined directly or indirectly, is a strong predictor of different dimensions of disordered eating.

Music has been described as an environment where performers are expected to consistently produce nothing less than perfection, especially if fame and notoriety are the desired outcome (Hays, 2002; Kenny, Davis, & Oates, 2004; Lacaille et al., 2007; Mor, Day, Flett & Hewitt, 1995). Because perfection is the expected level of performance, it would not be surprising to find musicians high in this psychological construct (e.g., Mor et al.; Stoeber & Eismann, 2007), however only one study, though, has directly examined perfectionism in musicians. Langendorfer (2008) reported that professional orchestra musicians were higher on self-oriented perfectionism than socially prescribed perfectionism. Given the long hours that most music majors and professional musicians spend practicing, often alone (Davidson, 2002), it makes sense that musicians would have high personal standards. Additionally, Langendorfer found that brass players were higher on socially prescribed perfectionism than woodwind players, which was attributed to the prominent sound these instruments make and the fact that they stand out and can be easily judged by others; no other differences on perfectionism existed between the different groups of musicians in this study. Although Langendorfer did not compare the musicians in his sample to nonmusicians, his findings do shed light on the types of perfectionism that may be present among different types of musicians.

Although few studies have examined perfectionism directly among musicians, researchers have studied performance anxiety (Kenny et al., 2004; Langerdorfer et al., 2006), which appears to be related to perfectionism. Performance anxiety is thought to be a common problem for musicians (e.g., Brodsky, 1996; Kenny et al., 2004; Raeburn, 1999). For example, 73% of adolescents at a school for gifted musicians were found to struggle with performance anxiety (Fehm & Schmidt, 2006). However, Chesky and Hipple (1999) found no differences in performance anxiety between college music majors and nonmajors. Given that nonmajors were asked about anxiety during “presentations,” which most undergraduates do fairly infrequently and may not be highly invested in and music majors were asked about anxiety performing music, which they do regularly and are highly invested given that it is their major, it is difficult to state that majors and nonmajors experience equal amounts of anxiety because other factors such as inexperience could contribute to nonmajors increased levels of anxiety. To understand the relationship between performance anxiety and perfectionism, Mor et al. (1995) examined self-oriented perfectionism and socially prescribed perfectionism in a sample of professional performing artists that included classical musicians. They found that both self-oriented and socially prescribed perfectionism were associated with debilitating performance anxiety. Similarly, higher levels of parental expectations were associated with more performance anxiety in a sample of female and male professional opera singers (Kenny et al.). This connection between perfectionism and performance anxiety may be due to similarities in the way the constructs are defined. Barlow (2000) described performance anxiety as a fear of failing to obtain desired results, and Langendorfer et al. (2006) suggested that the cognitive components of performance anxiety were really concerns about making mistakes. Given the similarities in how perfectionism and performance anxiety are defined, along with the high prevalence of

performance anxiety in musicians, it is likely that perfectionism is a trait that would be high in musicians in comparison to nonmusicians, and that specific dimensions of perfectionism, such as concern over mistakes, personal standards, and doubts about action, may then increase their risk of experiencing disordered eating.

Neuroticism. Neuroticism is defined by emotional instability and lack of self-control (Gual et al., 2002), and is comprised of symptoms of anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability (Costa & McCrae, 1992). Individuals high in neuroticism tend to experience greater levels of psychological distress and may struggle to cope with stress and life events more than those who are low in neuroticism (Cervera et al., 2003). Therefore, it is not surprising that neuroticism has been found to predict low levels of psychological well-being (Joshani & Nosratabadi, 2009) and would be expected to increase risk for development of many psychological disorders (Costa & McCrae).

Neuroticism has been correlated with eating disorders in clinical (e.g., Cervera et al., 2003; Diaz-Marza, Carrasco, & Siaz, 2000) and non-clinical samples (e.g., MacLaren & Best, 2009; Miller et al., 2006). For example, Miller et al. found significant relationships between neuroticism and symptoms of anorexia nervosa and bulimia nervosa in a sample of undergraduate women. Another study reported that symptomatic women scored higher on all facets of neuroticism (e.g., anxiety, angry hostility, depression, self-consciousness, and vulnerability) except for impulsiveness, compared to those who were asymptomatic (MacLaren & Best). Although Costa and McCrae (1992) suggested that various facets of neuroticism may predict different psychiatric disorders, the findings of MacLaren and Best suggest that almost any facet of neuroticism is related to eating disorders. In fact, Brannan and Petrie (2008) reported a direct relationship between total neuroticism scores and bulimic symptomatology in

female undergraduates, suggesting that future research does not need to consider specific facets of neuroticism.

To better understand the relationship between neuroticism and eating disorders, Cervera et al. (2003) conducted a large-scale longitudinal study with girls aged 12-21. The authors found that high levels of neuroticism increased the chances of developing an eating disorder (anorexia nervosa, bulimia nervosa or EDNOS) by four times over an 18-month period, establishing neuroticism as a risk factor. Neuroticism also has been found to moderate the relationship between body dissatisfaction and bulimic and anorexic symptomatology, suggesting neuroticism has both a direct and indirect relationship to disordered eating (Brannan & Petrie, 2008). Additionally, neuroticism was found to moderate the relationship between low levels of extraversion and symptoms of anorexia nervosa and bulimia nervosa such that low levels of extraversion were not related to eating disorder symptoms without the presence of high levels of neuroticism (Miller et al., 2005). This finding suggests that the combination of lower levels of sociability and higher levels of emotional instability increase the risk for eating disorders, possibly due to the availability of less social support as a means of coping and less emotional stability.

In studies with musicians, researchers have used the terms neuroticism and anxiety interchangeably. For example, Kemp's (1981) description and measurement of anxiety is quite similar to neuroticism, including emotional instability, insecurity, anxiety, depression, and self-control. In his study, Kemp examined the personality profiles of school-aged musicians (from youth orchestras, junior music conservatories, and schools for musically talented), college-aged musicians (full-time students in British music conservatories and university music departments), and professional musicians (either solo performers or members of professional orchestras) based

on Cattell's 16 personality types (Cattell & Kline, 1977). Neither instrument groups, solo vs. group performers, nor music style were reported by Kemp, however later writings indicated that the participants were classical musicians (Kemp, 1996). High levels of anxiety, in comparison to population means, were reported in both college student and professional samples; significant levels of anxiety were not found school-aged children. Both the college-aged music student group and the professionals reported low ego strength (feeling less emotionally stable) and professional female musicians reported high levels of tension (frustrated, driven, overwrought) in comparison to norms. Professional musicians also reported being suspicious, which loaded on the anxiety factor. In a sample of college students, Buttsworth and Smith (1995) found that the music students scored higher on emotional stability and lower on overall anxiety than the nonmusician comparison group. Differences in findings between the Kemp, and Buttsworth and Smith studies may be due to the level at which the musicians currently were performing. In the Buttsworth and Smith study, the musicians were auditioning for admittance into a music institution, whereas in the Kemp study the college-aged students already were enrolled in music conservatories and had obtained a diploma of standard performance on their first instrument. Thus, given that anxiety was highest and emotional stability lowest in more established musicians, these findings suggest relationships to investment and success in the field of music.

Researchers also have examined differences in neuroticism across various instrument groupings (Kemp, 1981; Willis & Cooper, 1984). For example, Willis and Cooper found neuroticism was higher in guitarists than other musicians (i.e., trumpet, trombonists, saxophonists, pianists, bass players, and drummers), whereas Buttsworth and Smith (1995) reported that keyboard players were higher on emotional stability than string, woodwind, brass, or singers, and string players were significantly higher than brass players on anxiety. However,

other studies have found no differences in neuroticism between instrument groups, such as singers, guitarists, bass players, and drummers (Dyce & O'Connor, 1994; Kemp, 1981). The equivocal relationship between neuroticism and instrument may be due to differences in the groups of musicians assessed (e.g., different levels of competence and investment) as well as in the way neuroticism was conceptualized and measured. More research is needed, using established measures of neuroticism, such as the NEO Personality Inventories (Costa & McCrae, 1992), to determine the extent to which different musician groups are similar to or different from one another.

Expanding the research beyond classical musicians into other musical genres, Dyce and O'Connor (1994) found higher levels of neuroticism, compared to norms, in female and male country and rock musicians performing in bars. Gillespie and Myers (2000), who used the NEO Personality Inventory (NEO-PR-I, Costa & McCrae, 1992), with a sample of self-identified musicians playing rock or popular style music in rehearsals, recording studios, or live performances also found high levels of neuroticism. Using the Eysenck Personality Questionnaire with a sample of male popular musicians, Cooper and Willis (1989) found neuroticism scores were higher than norms for adults. Although some differences in personality and pressure to perform may exist between classical and popular style musicians (Langendorfer, 2008), neuroticism is a trait that appears to be high among adult musicians, regardless of training or genre.

Research consistently has demonstrated a positive, direct, and predictive relationship between neuroticism and eating disorders (Cerveza et al., 2003; MacLaren & Best, 2009; Miller et al., 2006). Studies also have shown that musicians tend to experience higher levels of neuroticism than nonmusicians, though the strength of this relationship may vary by age, level of

competence, investment in a music career, and type of instrument played. Higher levels of neuroticism in musicians may be one explanation for the psychological difficulties they experience (e.g., substance abuse, depression, anxiety; Willis & Cooper, 1984), though research has yet to examine its relationship to eating disorders in this population. That neuroticism is high in both individuals with eating disorders and musicians, it makes sense to study their potential connection.

Musician identity. Self-concept is a multidimensional construct (Harter, 1996) in that each person has many identities that comprise the self. Within each aspect of the self, or each identity, there is a different level of importance (or how central it is to their overall identity) and of competence (how skilled they are in that area) (Brewer, Van Raalte, & Linder, 1993). If a specific identity is deemed important, an individual is more motivated to achieve it, and affective experience and self-esteem are affected by perceived success or failure in that area (Brewer et al.). Therefore, musician identity would be the degree to which individuals identify with their role as a musician, how important that identity is to their self-concept, and how competent they believe they are in this domain. Musicians who strongly define themselves through this identity would be motivated to succeed in this domain and would experience positive affect from successful performances. Overidentification with one identity, however, can lead to a narrowing of self-concept and ultimately, identity foreclosure, which is a commitment to one area at the expense of exploring and developing other identities (Schwartz, 2005). Identity foreclosure can occur in competitive environments, such as sports and music, because athletes and musicians often commit to a sport or instrument at a young age and then concentrate on performances in those areas to the exclusion of other activities (Good, Brewer, Petitpas, Van Raalte, & Mahar, 1993).

Musician identity has not received the same empirical attention as has athletic identity, though similarities between musicians and athletes exist, with both groups developing a focus or specialization at an early age, experiencing high levels of pressure to perform, giving up involvement in other activities, struggling with injury and retirement, and linking their sense of self to their performances (Brewer et al., 1993; Hays, 2002; Schwartz, 2005). Therefore, the athlete literature may provide information that can be generalized to musicians and be useful in understanding their identity and how it relates to different outcomes. Because it is common for musicians to commit to their instrument at a young age (Hays, 2002), college-aged musicians also would be at risk for identity foreclosure or at minimum developing a strong, one-dimensional identity as a musician, because specific identities strengthen with increased focus (Houle, Brewer, & Kluck, 2010).

There appears to be both positive and negative psychological outcomes to developing a strong identity associated with a performance domain, such as sports or music. Positive outcomes include developing a salient sense of self, achieving high levels of performance, and improving self-esteem (Brewer et al., 1993; Tasiemski, Kennedy, Gardner, & Blaikly, 2004). On the other hand, negative psychological outcomes may include difficulty transitioning out of the role of performer and career indecision (Murphy, Petitpas, & Brewer, 1996), overtraining and increased risk for injury (Brewer et al., 2003), or identity foreclosure and over-commitment to the performance domain, which can result in a narrow sense of self (Good et al., 1993). When a narrow, one-dimensional, sense of self develops, performers may experience immense pressure to succeed in that role and self-worth can become dependent on level of success (Jones, Glimtmeier, & McKenzie, 2005). Overidentification with the performance role also may be related to emotional disturbances (Linville, 1987). For example, Settles et al. found that higher

levels of athletic identity were associated with higher levels of stress and depressive symptoms, along with placing less importance on academics, greater levels of role conflict, and lower self-esteem.

In one study that directly and empirically examined music identity, Chesky (2009) modified the Athletic Identity Measurement Scale (AIMS; Brewer et al., 1993) and administered it to two samples of college students: music majors and nonmusic majors. Music majors reported significantly higher levels of overall music identity and social identity, exclusivity, and negative affect, compared to nonmusic majors. Music majors also reported that other's expectations of them related to music were significantly greater than nonmusic majors. For example, music majors reported feeling others would be disappointed if they stopped participating in music. Additionally, Davidson (2002) drew from her and Burland's previously unpublished data with professional classical musicians to provide support for strong musician identity. Results from interviews with performers, their teachers, parents, and peers over the course of eight years indicated that over time music identity became the key determinant of self-concept. These findings suggest that music identity increases as more time and resources are invested into music and that additional pressure and expectations from others may further narrow one's self-concept.

In order to distinguish between varying levels of music identity, it is helpful to understand what factors influence identity development. As identity development has often been studied in relation to parental relationships and eating disorders (Perry, Silvera, Nielands, Rosenvinge, & Hassen, 2008), musical identity also is shaped by relationships with parents and family values (Borthwick & Davidson, 2002). Specifically, parents involved in music themselves often expect children to become involved in music and enforce instrument practice

(Gabrielsson, 2003). These findings support the idea that greater external pressure influences the development of a narrow or one-dimensional identity. Musician identity also has been examined through transitions. Brodsky (2006) conducted interviews with members of a symphony orchestra and found membership in an orchestra represented a surrender to becoming a high-level soloist. This surrender alludes to a shift in music identity associated with a lack of success. During this shift, it is likely that self-concept becomes less stable and clear, which is related to negative psychological outcomes, including disordered eating (Houle et al., 2010).

Research has examined how self-concept is related to eating disorders, as a narrow sense of self, poorly defined self-concept, or unstable identity contribute to the development of disordered eating (Cash & Deagle, 1997; Stein & Corte, 2007). For example, in a clinical eating disorder sample, Stein and Corte found patients with anorexia nervosa and bulimia nervosa identified fewer positive aspects of themselves than healthy controls; anorexia nervosa and bulimia nervosa patients also reported greater interrelatedness of self-schemas, indicating a more narrow concept of the self than controls. These findings indicate that individuals with clinical eating disorders have a more negative view of self along with less differentiation of identities, or a more narrow sense of self compared to individuals without eating disorders. The relationship between a narrow sense of self and disordered eating is further supported by a case study with an elite swimmer. A strong, one-dimensional identity as an athlete increased the participant's vulnerability to develop bulimia nervosa because of the pressure she felt to succeed, and her self-worth being dependent on success in swimming (Jones et al., 2005). On the other hand, a poorly defined self-concept also may be related to disordered eating. In a sample of undergraduate women and men from the United States and Norway, poorly defined self-concept, as characterized by low clarity or self-knowledge, low self-esteem, and low feelings of control, was

directly related to eating disturbances (Perry, Silvera, Neilands, Rosenvinge, & Hanssen, 2008). Athletes and musicians may struggle with an unstable or poorly defined self-concept during transition periods (e.g., retirement from or participation on a new level; Houle et al., 2010), and therefore may be at risk for negative psychological outcomes, such as disordered eating, during these periods.

Although a strong music identity may increase commitment to music and facilitate success in performing (Brewer et al., 1993), negative psychological outcomes, including anxiety, depression, and eating disorders also are common (Brewer et al., 1993; Good et al., 1993; Jones et al., 2005). Research conducted by Chesky (2009) provides support for a strong music identity among college music majors, however few other studies exist. As previously stated, there are similarities between athletes and musicians, and research supports that athletes may experience a narrow or one-dimensional self-concept (Good et al., 1993). Athlete findings, in conjunction with Chesky's and Davidson's (2002) results, indicate that long-time musicians or those highly invested in music also may have a narrow, one-dimensional self-concept. Therefore, the negative consequences (e.g., depression, stress, and eating disorders) of a narrow self-concept or strong music identity pertain to musicians. Given these connections and the limited research in this area, it makes sense to examine musician identity and disordered eating to determine the extent to which they are related among musicians.

Current Study

Research suggests that certain personality traits, such as neuroticism (Cervera et al., 2003; Diaz-Marza et al., 2000; Tasca et al., 2009), perfectionism (Brannan & Petrie, 2008; Jacobi et al., 2004), and a narrow self-concept or identity (Cash & Deagle, 1997; Stein & Corte,

2007), often precede the development of eating disorders, increasing individuals' risk (Vitousek & Manke, 1994). Many of the personality traits associated with disordered eating have either been found at high rates in musicians or are hypothesized to be high in musicians because of correlations with other established traits, such as performance anxiety (e.g., Buttsworth & Smith, 1995; Dyce, 1994; Kemp, 1981; Kenny et al., 2004). Disordered eating has not been examined in musicians, but given the overlap of personality traits in musicians and those with eating disorders, it is possible that disordered eating attitudes and behaviors are present at levels higher than found in the general population.

The current study will examine the prevalence of eating disorders, and pathogenic eating and weight control behaviors among university music majors and nonmajors (as a comparison group). I will also compare music majors and nonmajors on the personality dimensions of neuroticism, perfectionism, and musician identity to determine if music majors score higher, as demonstrated in previous research. Finally, I will examine the relationship of these three personality characteristics to bulimic symptomatology after controlling for the influence of actual body size (i.e., BMI), which is a known predictor of disordered eating (Stice, 2002).

Hypotheses for the current study are:

- I. Clinical and subclinical eating disorders will be present in college music majors at a rate higher than reported in a general college sample for men and women.
- II. Among musicians, eating disorders will also be most prevalent among music performance majors because of the instrument groups within the major, along with increased performance pressure. Differences in eating disorder prevalence rates will also exist between instruments.

- III. With regard to pathogenic weight control behaviors, music majors will report engaging in behaviors at higher rates than nonmajors. Dieting and exercising will be the most frequently endorsed behavior.
- IV. With regards to the personality dimensions, female and male music majors will report higher levels of neuroticism, doubts about action, concern over mistakes, personal standards, and musician identity, than their same-sex, non-major counterparts.
- V. Neuroticism will be most strongly related to bulimic symptomatology, followed by elevated levels of concern over mistakes, parental expectations, and doubts about actions. I expect that higher AIMS scores also will be associated with more bulimic symptomatology, though at a level lower than the other two personality variables.

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