

A STUDY OF INDIVIDUAL DIFFERENCES AND
STRESS AMONG NORTH AMERICAN MUSICIANS

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A Study of Individual Differences and Stress Among North American Musicians

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Emmanuel Angel

Dedication

To my artistic, creative, and loving son Daniel who inspires me with his high *Openness to Experience* and willingness to take risks, and who invariably forces me to see life and art from a larger perspective. I would also like to dedicate this work to my late father, Jacob Marks, who had enormous intellectual curiosity, who was a true thinker and fine talker, and who had a deep love for art, literature, poetry, music, and scholarship. He would have been very proud of my accomplishments. I thought of him often during this effort. Finally, I dedicate this to my mother, Claire Angel Harmon, the classical pianist and Mozart lover, who sat me at the piano as a young child and introduced me to the soulful beauty and the enchantment of music, from all over the world, from many epochs, many nations, many cultures, and many faiths.

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ABSTRACT

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Emmanuel Angel

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An exploratory study using a web-based questionnaire collected 1,405 responses, primarily from musicians in the United States and Canada. Questionnaire items measured the Big Five dimensions of personality, psychosomatic health, sources of occupational stress, general demographic variables, and music related variables. A three-stage hierarchical clustering method assigned musicians to nine clusters based upon the Big Five dimensions of personality, forming a typology. Exploratory factor analysis of two item sets yielded latent variables for typal explication. The first analysis produced five group factors and one general factor for measuring occupational stress. The second analysis produced a unidimensional scale measuring psychosomatic troubles. Multivariate and univariate tests found both occupational stress and psychosomatic troubles to be significantly higher in types high on Neuroticism. Within-type comparisons using the standard error of proportional differences found that types high on neuroticism were less satisfied with their present musical activities, had less enjoyment in their work as musicians, and were likely to earn less. Members of the type highest in neuroticism, constituting 9% of musicians clustered, reported the highest stress and psychosomatic troubles, smoked more, and deviated most with respect to sample norms. Musicians were above average on the Big Five dimension Openness to Experience.

Table of Contents

Dedication.....	iii
Acknowledgments.....	iv
Abstract.....	v
Table of Contents.....	vi
List of Tables.....	viii
Chapter 1: Introduction.....	1
Chapter 2: Literature Review.....	3
The Costs of Stress.....	3
Stress: Complex Phenomena.....	6
Musicians, Stress, and Strain.....	9
Personality of Musicians.....	15
Chapter 3: Method.....	21
Creation of an Internet-Based Survey.....	21
Recruitment of Participants.....	21
Protection of Research Participants.....	25
Measures.....	25
Data Analyses.....	30
Research Hypotheses.....	39
Chapter 4: Results.....	43
Descriptive statistics.....	43
Factor Analysis and Scaling of the Musician Sources of Pressure Instrument...	48

Factor Analysis and Scaling of the Psychosomatic Troubles Instrument.....	54
Typal Structure.....	56
Synopses of Typology.....	63
Canonical Analyses.....	72
Research Hypotheses.....	76
Chapter 5: Discussion.....	79
Overview.....	79
Musicians and the Big Five Dimensions of Personality.....	79
Musicians and Occupational Stress: Sources of Pressure.....	90
Musicians and Psychosomatic Troubles: Identifying those Most at Risk.....	96
Strengths of the study.....	97
Weaknesses of the study.....	98
Future Research.....	98
Implications of the study.....	101
Appendix A.....	107
Appendix B.....	122
Appendix C.....	124
Appendix D.....	125
Appendix E.....	126
Appendix F.....	128
References.....	147

List of Tables

Percentages and Frequencies for Major Regions in the USA plus Canada.....	43
Racial Composition of Musicians.....	44
Personal Demographics for Main Sample of Musicians.....	45
Age Turned Professional.....	47
Years Worked as a Professional.....	47
Weekly hours worked in non-musical job.....	48
Income in US Dollars.....	49
Rotated Factor Structure for the Musician Sources of Pressure Instrument.....	51
Dimension of the Psychosomatic Troubles Instrument.....	55
Prevalence, Homogeneity, Similarity and Replication Rates for Typology of Musicians.....	58
Mean NEO-FFI Raw and T Scores Comprising Profile Attributes for Typology of Musicians Plus Total Means.....	60
Figure 1. Mean T Score Profiles for Nine Musician Types.....	62
Mean Scores of Nine Types on Statistically Significant External Validator Variables..	64
Canonical Relationships for Five Neo-FFI Dimensions with Key External Explicating Variables.....	74
Figure 2. Mean T Scores for Neuroticism plotted with Five Group Pressure Factors, the General Pressures Factor, and Psychosomatic Troubles.....	91
Distribution and Prevalence of Gender in Musician Profile Types.....	128
Distribution and Prevalence of Having Children in Musician Profile Types.....	129

Distribution and Prevalence of Possessing a Graduate Degree in Profile Types.....	130
Distribution and Prevalence of Musicians Age 45 and Older in Profile Types.....	131
Distribution and Prevalence of Musicians Turning Professional at 18 or Younger in Profile Types.....	132
Distribution and Prevalence of 24 or More Years as a Professional Musician in Profile Types.....	133
Distribution and Prevalence of Marital Status in Musician Profile Types.....	134
Distribution and Prevalence of Music Degree, Non-Music Job After School, and AFM Membership in Musician Profile Types.....	135
Distribution and Prevalence of Mom and Dad Support in Musician Profile Types.....	136
Distribution and Prevalence of Improvisational Importance and Improvisational Ability Self-Rating in Musician Profile Types.....	137
Distribution and Prevalence of Current Cigarette Smoking and Usage in Musician Profile Types.....	138
Distribution and Prevalence of Several or More Drinks Per Week in Profile Types.....	139
Distribution and Prevalence of Psychosomatic Troubles T-Scores 50 or Greater in Profile Types.....	140
Distribution and Prevalence of Classical Musicians in Profile Types.....	141
Distribution and Prevalence of Father's History as Pro/Semipro in Profile Types.....	142
Distribution and Prevalence of High Satisfaction Regarding Current Musical Activities in Profile Types.....	143
Distribution and Prevalence of High Enjoyment in Work as a Musician in Profile Types.....	144

Distribution and Prevalence of 35 or More Non-Musical Work Hours Per Week in Profile Types.....	145
Distribution and Prevalence of \$60,000 Income Yearly in Profile Types.....	146

Chapter 1

Introduction

The public's perception of the musician is likely to be an idealized one. The public is entertained and inspired by the creative output of many kinds of musicians in many settings. From concert stage to nightclub to sports arena, from advertising jingle to film score, from TV to radio, from compact disc to MP3 player to the World Wide Web, the public enjoys the fruits of the musician's imagination and performance abilities. Less often perceived is the single-mindedness, passion, dedication, discipline, frustration, and the agony that invariably accompanies the ecstasy.

Over the past few decades the life of the musician has increasingly been the subject of serious inquiry. Although popular press and media alternately hype and dissect musicians' personas, researchers have attempted to look behind the public images to better understand musicians and the actual processes involved in music making itself. While there is a longer standing tradition of inquiry into musical ability and the cognitive aspects of music making, it is only more recently within the past 30 years or so that the musical temperament has come under systematic study.

Emerging from the study of the musical temperament has been the realization that musicians cannot be understood as idealized objects outside the context of their real lives. Musical personalities must live in climates that in many ways challenge their existence. Numerous studies have examined the stresses and strains that are common parts of the musical life, from performance anxiety, to risks of physical injury, to concerns about current and future employment, to difficult interpersonal relationships and fierce competition among peers. These sources of pressure appear in many cases to be further

exacerbated by musicians' own tendencies toward perfectionism, sensitivity, introversion, independence, and trait anxiety; all qualities which appear to come with the territory of musicianship. Thus, the study of musicians' personalities and the stresses and strains experienced by musicians are inextricably tied to each other.

The current study is known publicly as the Musician Study with a website of the same name, <http://www.musicianstudy.org/>. It is different from prior studies of musicians insofar as it examines the relationships among personality, sources of stress, and health symptoms across a large population of musicians reflecting a diversity of musical styles and musical occupations, from classical to rock, from composer to performer. In examining variables in musicians' lives it has focused upon the importance of the relationship between personality and the stress process. To achieve these goals, the Musician Study has deployed reliable and valid psychological/behavioral measures on the Internet to collect data, and it has employed clustering techniques that capitalize on replication to create a typology of musicians.

Why is this significant? This is significant because the stresses and strains that affect musicians *have never been examined en masse across genres using a common yardstick*. Since not everyone has the same constitution, risk factors must be assessed at the *individual level*, in terms of *personality* or *temperament*. No single study that has asked the broad question, *who are North American musicians, how do they vary, and how do they experience occupational stress?*

Chapter 2

Literature Review

The Costs of Stress

A Google search on the phrase *costs of stress* returned 6,390,000 links in March of 2005 when this study was proposed. Today in April of 2010 it returns 36,300,000; more than a five-fold increase. And while these numbers alone might be a questionable indication as to the extent of actual costs, the notion that stress has profound costs associated with it is a ubiquitous one.

Following one of the above links would indicate that stress is indeed costly. According to the website of the American Institute of Stress (AIS), stress has been described as “America's #1 Health Problem” with job stress labeled as “far and away the leading source of stress for adults” (AIS Website, top link from home page). AIS declares that job stress is “very costly with the price tag for U.S. industry estimated at over \$300 billion annually as a result of accidents, absenteeism, employee turnover, diminished productivity, direct medical, legal, and insurance costs, and workers' compensation awards as well as tort and FELA judgments” (AIS Website, job stress page). And this statement does not address other forms of stress outside the workplace, such as stress from major life events like divorce or the death of a family member.

Although it may be impossible to place a price tag on stress and the accuracy of the \$300 billion estimate is questionable (see Statistical Assessment Service, Stats at George Mason University web page), the fact that occupational stress is perceived as pervasive is well documented. A report titled “Stress at Work” by the National Institute for Occupational Safety and Health (NIOSH), an organizational component of the Centers

for Disease Control and Prevention (CDC) of the United States Department of Health and Human Services, cited survey findings by: (a) Northwestern National Life, in which 40% of workers reported their job was “very or extremely stressful”, (b) Families and Work Institute, in which 26% percent of workers said they were “often or very often burned out or stressed by their work”, and (c) Yale University, in which 29% of workers felt “quite a bit or extremely stressed at work” (National Institute for Occupational Safety and Health, Report: Stress at Work). An annual “Attitudes In The American Workplace VI” Gallup Poll in 2000 found that: (a) “80% of workers feel stress on the job, nearly half say they need help in learning how to manage stress and 42% say their coworkers need such help”, (b) “14% of respondents had felt like striking a coworker in the past year, but didn’t”, (c) “25% have felt like screaming or shouting because of job stress, 10% are concerned about an individual at work they fear could become violent”, and (d) “9% are aware of an assault or violent act in their workplace and 18% had experienced some sort of threat or verbal intimidation in the past year” (AIS Website, job stress page).

If these public opinions are representative, then stress is widely perceived as a major problem and a large body of research appears to confirm this perception.

According to Levi (2005):

A number of studies in different countries have shown a relationship between exposure to environmental stressors (such as high psychological demands combined with low decision-making latitude and low level of social support) and morbidity and mortality (Karasek & Theorell, 1990). Although correlation is not causation, the evidence is strong enough to justify measures to prevent or reduce stress, at least if applied in an experimental matter and if properly evaluated (Kompier & Levi, 1994; Levi & Levi, 2000) (Introduction).

For example, a meta-analysis on immune response to stress “found substantial evidence for relationships between stressors and a range of immune parameters and that

objective stressors were related to larger changes in immune functioning than self-reports of stress” (Jones & Bright, 2001, p. 81). Numerous studies have reported links between stress and psychological outcomes such as depression, psychosomatic complaints, burnout, and general psychiatric morbidity. Research into physiological responses to stress has included cardiovascular disease, cancer, HIV/AIDS, ulcer, musculoskeletal pain, general morbidity, and mortality. Research into the behavioral outcomes of stress has included substance abuse, preventative health care behavior, physical activity, and nutrition, in which “unhealthy behaviors are seen as mechanisms for coping with stress” (Semmer, McGrath, & Beehr, 2005, p. 16). With regard to mortality, Levi (2005) reported, “An estimate made in a World Health Organization teleconference on October 12, 1990, indicates that such diseases of lifestyle are the cause of 70 to 80% of premature deaths in the industrialized countries” (Introduction). In terms of the prevalence of stress-related problems, this estimate appears consistent with a statement cited by Sternbach (1995): “Among the general population, ‘more than two thirds of doctors’ visits are for stress-related symptoms. Many of the most frequently prescribed medications, among them Prozac, Tagamet, and Valium, are designed to relieve depression or ease anxiety’ (Nucho, 1988, p. 5)” (1995, p. 284).

Recent evidence suggests that stress is in fact on the rise, suggesting that the increase cited above in the number of stress-related web links is not due only to the proliferation of websites. A report titled *Stress in America* (American Psychological Association, 2007) presents survey results for 1,848 adults aged 18 and over, proportionally weighted to represent the U.S. population. The report states:

Stress is a fact of life (agreed 79 percent of people), but according to survey responses, Americans routinely experience what they believe are higher than

healthy levels of stress. One-third of people in the U.S. regularly report experiencing extreme levels of stress (32 percent), and nearly one in five (17 percent) report that they experienced their highest level of stress 15 or more days per month. Even more alarming, nearly half of Americans (48 percent) believe that their stress has increased over the past five years (p. 3).

Nearly half of those surveyed reported that stress was negatively impacting their emotional well-being (49%) and physical health (46%) (American Psychological Association, 2007). The report found that Americans were more stressed over work and money in 2007 than they were in 2006, with housing costs identified as an additional stressor. More than 25% of the sample reported that stress was having a serious impact on one or more aspects of their personal relationships, such as with friends and family. Those with low income reported more problems in managing stress, and those in specific vocations such as health care and education reported higher levels of stress. Stress appeared to be regional as well with those on the East and West coasts reporting higher levels. Participants reported increases in unhealthy behaviors, such as drinking and smoking, as a result of stress. While the “sandwich generation” from ages 35 to 54 reported higher levels of stress, young people were more likely to exhibit unhealthy means of coping with stress, such as smoking more, losing sleep, and skipping meals.

Stress: Complex Phenomena

Although stress would appear to be a pervasive, consistent definitions of stress have been hard to come by, even for those who study it. Cooper and Dewe (2004) noted “The debate over the term ‘stress’ has been intense, and there is in stress research almost a tradition to remark on this fact and to query whether stress is any different from simply being alive” (p. 110). Two major related themes underlie the history of thought regarding stress. First, nonphysical factors can cause or contribute to disease. Second, the demands

of life may be so extreme as to engender states of psychological or biological disease (Cooper & Dewe, 2004, p. 2). That the well-being of the individual is tied to the nonphysical is nothing new, as “Hippocrates once proclaimed that the ‘nature of the body can only be understood as a whole, for this is the great error of our day in the treatment of the human body, that physicians separate the soul from the body’” (Cooper, 2005, Preface). Still, stress research seems to elicit constant debate and controversy due to the difficulties in operationalizing and measuring stress, the incremental effects of stressors over time, and difficulties in controlling for the effects of numerous other variables that may bias or confound findings; findings that are often correlational, emerging from observational studies in naturalistic settings (for a discussion see Jones & Bright, 2001; Levi, 2005).

Within the last 50 years, stress research has emerged as a major interdisciplinary area of study, with movement away from early mechanistic views toward those which embrace cognition and emotion as central to the stress process. In addition to an earlier, more static, behavioral paradigm of stress as simple external stimulus and response (S-R) (Jones & Bright, 2001), more inclusive *interactional* models have been developed that focus on relationships among stimulus, organism, and response variables (S-O-R) in which a stressor (stimulus) places demands upon an individual with unique characteristics (organism) who then reacts (response) (Cooper & Dewe, 2004, p. 58). Building upon these basic behavioral-cognitive paradigms, a rapidly growing body of literature on stress reflects a multiplicity of constructs, variables that purport to measure them, and a complex of relationships arising among them (Jones & Bright, 2001).

Variables in stress research are often categorized as stressors, intervening variables, and strains (Jones & Bright, 2001, p. 14). Stressors are thought of as features of the environment that place some type of demand on the individual, such as major life events, daily hassles, or chronic stressors (e.g., workload, work role). Intervening variables often measure personality (e.g., hardy personality, 'type A' behavior, and negative affectivity), coping styles and strategies, or environmental factors (e.g., a person's social support or a person's degree of control within an environment such as the workplace). Strain variables measuring stress outcomes may consist of psychological effects (e.g., anxiety, depression), physiological functioning (e.g., blood pressure, adrenaline secretions), disease (e.g., coronary heart disease, colds and flu, cancer), or behavior (e.g., work performance, smoking, and drinking). While this three-way categorization is typical of an interactional approach to studying stress, *transactional* approaches further abstract the stress inducing properties of environmental stimuli, blurring the line between external demands and the individual such that stressors achieve salience increasingly "in the eye of the beholder" rather than in terms of an objective criteria (Semmer, McGrath, & Beehr, 2005, p. 19). Transactional models thus take into account not only intervening personality and environmental variables, but the sequential, multi-staged processes in which individuals cognitively *appraise* potential demands in the environment, ways in which they might *cope* with those demands, and how all of this might change over time (Cooper & Dewe, 2004; Jones & Bright, 2001). According to such models, stress is viewed as a "complex, multivariate process" (Jones & Bright, 2001, p. 20); a process rooted at the individual level encompassing subjective notions such as "personal meanings" or "the subject's definition of the situation" (Cooper & Dewe, 2004, p. 72).

Musicians, Stress, and Strain

According to Sternbach (1995) “stress and stress related illness and injuries are pandemic among professional musicians today, and the problems of musicians and other performers have, until recently, gone virtually unnoticed and untreated” (p. 283).

Sternbach cited one study which reported that from 1959 to 1967 musicians had a life expectancy of 54 years as compared with a normal life expectancy of 69 years, with 3% more deaths from coronary heart disease. Citing results from a 1985 survey of 48 orchestras ($N=2,212$ of 4,025 polled), Sternbach reported 82% were experiencing at least one medical problem, 76% experienced pain that affected their performance, and nearly 30% used beta-blockers originally intended to treat high blood pressure to treat stage fright.

Musicians face a number of stressors capable of leading to psychological and physical strain. Performance anxiety or ‘stage fright’ is a common problem affecting musicians of all ages and levels of experience (Abel & Larkin, 1990; Cooper & Wills, 1989; Dews & Williams, 1989; Gabrielsson, 2003; Khalsa, Shorter, Cope, Wyshak, & Sklar, 2009; Kenny, Davis, & Oates, 2004; Langendörfer, Hodapp, Kreutz, & Bongard, 2006; Marchant-Haycox & Wilson, 1992; Steptoe, 1989; Steptoe & Fidler, 1987; Sternbach, 1995; Wills & Cooper, 1988). While moderate levels of anxiety have been associated with higher levels of performance according to the Yerkes-Dodson Law, in which performance is an inverted U-shaped function of anxiety (Steptoe & Fidler, 1987, p. 242), high levels of anxiety may have serious psychological, physical, and behavioral consequences, including full-blown anxiety attacks or even cardiac arrest in the most extreme cases (Sternbach, 1995, p. 293).

Other stressors derive from environmental hazards and the physical demands placed on musicians (Wills & Cooper, 1988; Sternbach, 1995). Environmental stressors include high-volume levels that may result in hearing loss, tinnitus, or even interference with the cardiovascular system at very high levels. Extremes in temperature and humidity, inadequate lighting, poor ventilation, and older backstage areas that may be contaminated with asbestos all place the musician at risk. Musicians must often look after expensive instruments which are also sensitive to changes in temperature and humidity. Extensive travel can be an additional source of stress with all of its inherent uncertainties and dangers, often combined with time pressures in which, “musicians may travel eight hours, cross three time zones, and perform the same evening” (Sternbach, 1995, p. 288). Musicians may work long hours, rehearsing, recording, traveling, and performing all in one day, with the subsequent risk of a late and tired drive home. This kind of late shift work can affect the body’s natural rhythms and metabolic function. And on top of this, musicians are called upon to concentrate and perform at peak levels for extended periods of time, as when playing Mozart’s *Marriage of Figaro*, which “demands split-second timing by all players that must be sustained for nearly 4 hours” (Sternbach, 1995, p. 286). Musicians must also maintain high levels of flexibility and athleticism to deal with the physical demands of playing their instruments and with these highly complex neuromuscular demands come the constant risk of overuse, pain, injury, and long-term wear and tear on the body that can end a career (Sternbach, 1995; Wills & Cooper, 1988; Wilson, F. R., 1989).

Beyond physical aspects of the work situation, Wills and Cooper (1988) and Sternbach (1995) have cited examples of a number of similar job-related stressors: (a)

Disruption in family life due to travel and working unusual hours, (b) employment insecurity, career development, and compensation, (c) stress associated with changes in work, such as a loss of control over work schedule, (d) periods of work *underload* when little work is available, (e) periods of work *overload* when a musician might feel compelled to compensate for the slow times by taking whatever work is available, (f) problematic aspects of person-environment fit and low job satisfaction, in which musicians may experience boredom and frustration from having to take on boring work that they are overqualified for, (g) labor-management conflicts over issues such as low wages, arbitrary hiring practices, and benefits, (h) organizational structure and climate which may include a lack of decision-making power and difficulties in dealing with the machinery of a profit driven music business that is prone toward treating musicians as commodities to be used, (i) interpersonal relationship stress from having to deal with difficult bandleaders, conductors, and competition from fellow musicians.

In addition to these sources of stress, mostly external in nature, musicians must deal with the self-criticism, perfectionism, and pressure they place on themselves to achieve and maintain high performance standards. This intense striving for perfection is captured in a retrospective biographical study of Jimi Hendrix's giftedness:

He also displayed the sensitivity, perfectionism, and intensity that Dabrowski described as characterizing the creatively gifted. While recording, he would sometimes insist on hundreds of takes, and spend hours in the studio, to produce exactly the sounds he wanted (Redding & Appleby, 1996; Shaprio & Glebbeek, 1994). Producer Eddie Kramer described how "he'd be down there grimacing and straining, trying to get it to come out of the guitar the way he heard it in his head" (quoted in Morthland, 1996). Both Miles Davis (1990) and Linda McCartney (1992) were struck by his personal intensity, while another friend remarked that he "fluctuated so fast from great joy to intense unhappiness" (Shaprio & Glebbeek, 1994, p. 476) (Morrisey, 2001, p. 7).

In their study of popular musicians Wills and Cooper found the most frequently nominated item among various sources of stress to be “Feeling that you must reach or maintain the standards of musicianship that you set for yourself” (1988, p. 74). A similar sentiment was expressed in an American study of university music students. Dews and Williams (1989) warned of the intense pressures that these student musicians placed on themselves in noting that “when asked if a considerable amount of their self-esteem is directly related to how they perform it is disturbing to see that 79% of those responding to the survey answered ‘yes’. This is direct evidence that musicians, possibly more than any other group, have a problem in separating themselves from their art/work.” (p. 45). The prevalence of these kinds of intense feelings among musicians might shed some light on questions of links between the artistically creative temperament and mental illness; questions that have spawned intense debates and an extensive literature (Drevdahl, 1956; Gelade, 1997; Grotstein, 1992; Ludwig, 1992; Lund & Kranz, 1994; Ostwald, 1992; Poole, 2003; Schlesinger, 2004; Wills, 2003; Wills, 2004).

Additional evidence for stress associated with the musician's life and performance is plentiful. A study of elite operatic chorus artists reported high levels of personal strain, concerns over job role ambiguity, the physical working environment, performance anxiety, and high levels of trait anxiety (Kenny, Davis, & Oates, 2004). A study of professional orchestra musicians, undergraduate music students, and amateur musicians found the taking of sedatives, reading, meditation, and the drinking of alcohol, all used as means of dealing with performance anxiety, which was related to neuroticism (Steptoe & Fidler, 1987). Increases in systolic blood pressure were found in 22 student musicians, particularly the males, before a jury performance, although females had higher levels of

self-reported anxiety (Abel & Larkin, 1990). In a British study of 41 advanced music students and 65 members of the Royal Philharmonic Orchestra and London Philharmonic Orchestra, Steptoe (1989) found a positive correlation between performance anxiety and perceptions of career stress. Among the professional orchestral musicians the highest sources of stress were irregular hours, separation from family, the monotony of rehearsals, and traveling. Student musicians were most stressed about the uncertainty of regular employment and backstabbing among colleagues.

A survey study of elite musicians and dancers found both kinds of female performers to be negatively affected by stress from erratic work schedules and isolation while benefitting from less stress than population norms in the areas of self care, mood problems, vocational attitude, supervisory responsibilities, and role insufficiency (Hamilton, Kella, & Hamilton, 1995). Male musicians however appeared to suffer from more work-related stresses, were characterized as “depressed, anxious, and irritable” (p. 87), and were found to have more mood problems than the female performers and population norms. On scales of personality and occupational stress, the male performers deviated negatively on more measures than their female counterparts. Only 19 musicians however took part in the study.

Langendörfer et al. (2006) measured several personality characteristics among 122 members of six German symphony and opera orchestras using take-home questionnaires to explore relationships between personality and performance anxiety. The researchers measured neuroticism using the 12-item subscale of the NEO-FFI 5 factor personality instrument; the same instrument used in the current study. As predicted, the researchers found significant positive correlations between neuroticism and physical symptoms of

stress such as trembling and dry mouth. Also as predicted, neuroticism correlated positively with all three aspects of performance anxiety measured (i.e., lack of confidence, emotionality, and worry) when considered either during rehearsals or live performances. For the rehearsal condition, all three measures of performance anxiety correlated more highly with neuroticism than the respective live situational performance anxiety, and all three correlations were highly significant ($p < .01$).

Most studies mentioned thus far have focused on classical musicians. Cooper and Wills (1989; see also Wills, 1984) conducted in-depth, two-hour tape-recorded interviews with 70 male popular musicians in Britain. Noting that more than half of the 40,000 members of the British musicians Union worked in the popular field, and noting common impressions of high mortality and drug abuse among popular musicians, they sought to identify sources of stress that might put this sizable group at risk. As in the case of classical musicians they found anxiety to be a problem, both performance related, and in terms of the frequent observation that the musician had a need “to reach or maintain self-imposed standards of musicianship” (p. 25). Low self-esteem, a lack of understanding by the general public of what the musician must go through, the public perception that being a popular musician was not a real career, and the public's ignorance of musical standards, were sentiments commonly expressed by popular musicians. Work overload and the irregularity of work were noted as a major stressors, as was work underload and having to take boring, unappealing gigs to survive. Low job satisfaction, concerns over career development, and work relationships were all seen as sources of stress. And all of the above variables conspired to make the popular musician's social and family life problematic, given the irregular hours and frequent travel.

In addition to interviewing this sample of 70 musicians, Cooper and Wills (1989) administered the Eysenck Personality Questionnaire. Compared with adult male norms, popular musicians scored higher on Psychoticism and Neuroticism, with average Neuroticism scores higher than any other professional group in the manual. Neuroticism may account for the high levels of anxiety expressed by the sample. High Psychoticism scores, associated with tough-mindedness and suspiciousness, may actually indicate some level of adaptation to this lifestyle. Cooper and Wills noted that these scores comport with the scores of classical musicians and creative professions more generally. This leads directly into a review of the musical temperament.

Personality of Musicians

According to Anthony Kemp, the most prominent researcher into musicians' personalities (Davies, 1997), early studies into the musical temperament failed to produce consistent findings due to the nature of the groups studied as well as the variety of measures used. Thus, Kemp adopted Cattell's instruments and sought more representative samples. Kemp (1981a) studied three samples of British performers consisting of (a) 496 secondary *school musicians* ages 13 to 17, (b) 688 full-time *music students* ages 18 to 25 from 20 British conservatoires and University Departments of Music, and (c) 202 *professional musicians* ages 24 to 70 drawn from an organization of solo performers and professional orchestras. For this study, Kemp used the Anglicized version of the High School Personality Questionnaire (HSPQ) for the school musicians and the Sixteen Personality Factor Questionnaire (16PF) for the music students and professionals, testing the musicians and three comparable contrast groups consisting of non-musicians (p. 4). Kemp entered raw personality scores into three MANOVA analyses, controlling for age,

sex, socioeconomic status, and educational level. Kemp also compared highly talented subgroups of the school musicians and music students with their respective groups.

Results showed the two older groups, both the music students and the professional musicians, to be higher than their respective control groups on Cattell's second-order factors of Introversion, Anxiety, Pathemia (i.e., Cattell's neologism indicating sensitivity, imagination, feeling, and intuition), and Intelligence. The professional musicians were also higher on Independence indicating dominance, imagination, adventurousness, suspiciousness, and surgency, an energetic quality (Kemp, 1981a). The two more talented subgroups were even higher on Introversion and Anxiety than the rest of the musicians in their respective samples (Kemp, 1981a, p. 8).

In another study (1981b) Kemp examined the traits of the composer. Subjects consisted of 36 male composers from British conservatoires and University Departments of Music ages 18 to 25 and a group of 38 professional composers, 28 males and 10 females, ages 24 to 62. Using the same measurement and analytic approach as in the study of performers (Kemp, 1981a), Kemp found that composers are overall higher on Introversion and Independence than non-composing musicians. Kemp characterized the personality profiles of these highly creative individuals, who account for only a small proportion of musicians overall, as being displaced similarly but appropriately further from population norms than their non-composing musical counterparts, their greater deviance commensurate with their lower prevalence. Male composers were also higher on Cattell's second order factor of Poor Upbringing. This factor, usually interpreted as meaning low morality, is seen as being part of the creative personality in the context of

these composers who are characterized as “bold introverts”, driven to conform more to their own internal dictates than to external ones (p. 72).

In a study of sex differences among musicians Kemp (1982) reanalyzed the three samples of musicians used in the above study of performers (Kemp, 1981a). Overall, personality differences between the sexes were less marked than among non-musicians. Kemp suggested that the traits necessary for musicianship make the sexes appear more similar to each other than in the overall population, with interaction effects generally featuring a “leveling out” (p. 53) on those traits associated with music. In a later study of gender differences among musicians Kemp concluded that with regard to stereotypical sex roles, “evidence suggests that musicians generally appear able, probably quite unconsciously, to extricate themselves from the major influences of these prototypes, each gender appearing to assume certain characteristics of the other” (Kemp, 1996, p. 119). Blurring of sex-role stereotypes was also found in a study of professional and non-professional female musicians who conformed less to gender role stereotypes than the general population (Stremikis, 2002).

The study of elite musicians and dancers discussed earlier found both groups to be more introverted than population norms on the Adult Personality Inventory (Hamilton, Kella, & Hamilton, 1995). However in addition to very small sample size, this group of musicians was homogeneous with 19 string players chosen from Local 802 Associated Musicians of Greater New York (p. 86).

Not all studies however have characterized the musical personality in terms of bold introversion as the following studies with music students reveal. Using a sample of 350 music students drawn from ten British university music programs, Shuter-Dyson (2000)

found both men and women to be significantly more extroverted than population norms on the short form Revised Eysenck Personality Questionnaire (Revised EPQ). However 67% of students in the sample were potential teachers, this perhaps accounting for the higher level of extraversion. A study of 168 church musicians by Shuter-Dyson (2006), also using the revised EPQ, found female musicians to be more introverted than population norms and male musicians more extraverted.

Wubbenhorst (1995) found a uniform preference for extraversion using the Myers-Briggs Type Indicator (MBTI) with an American sample of graduate students, 56 in music education and 50 preparing for careers as performers. However despite its widespread use the MBTI, based on Jungian theory, is not an empirically derived instrument (i.e., it relies on the existence of a hypothetical typology rather than psychometrically derived dimensions), and while some claim a consistent relationship with other more established measures, others have presented evidence questioning its reliability and validity (Kemp, 1996, p. 12). Buttsworth and Smith (1995) tested Australian music students with a median age of 18 as well as a control group in a study similar to Kemp's (1981a) using Cattell's 16PF. In contrast to Kemp they found the musicians to be higher in Extraversion, lower in Anxiety, and lower in Intelligence than the control group, although findings on gender differences were in accord with Kemp's (1982). They also found differences in second-order factors of personality by instrumental family, most notably with brass players higher in Extraversion and lower in Anxiety as compared with string players, as consistent with other findings (Kemp, 1996). This would also seem consistent with Dollinger's (1993) assertion that musical stimuli

with higher arousal potential (i.e., instruments capable of producing louder, more strident sounds, such as brass) might appeal to those higher in extraversion.

In contrast, a later analysis of the same sample of 122 German orchestra musicians studied for personality and performance anxiety (Langendörfer et al., 2006) failed to support the stereotype that brass players are more extraverted than string players (Langdörfer, 2007). These were professional musicians, not students however, and the author suggests that musicians who succeed in getting positions in top-level professional orchestras may exhibit a *musical temperament* that is more homogeneous. Using the German version of the NEO-FFI, the study measured the Big Five dimensions of personality (i.e., Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness). String players were higher on Conscientiousness than brass and woodwind players but this was the only significant difference among the musical instrument groups in terms of the NEO-FFI. This study also analyzed correlations among the NEO-FFI dimensions and nine other variables (e.g., trait anxiety, self-esteem, general self-efficacy, self oriented protectionism, socially prescribed perfectionism, need for harmony, empathy, networking, and assertiveness). Of interest, Neuroticism and trait anxiety produced the highest correlation ($r = 0.83, p < .01$) among the fourteen variables measured.

Several studies of popular musicians have also diverged from Kemp's finding of introversion. Dyce and O'Connor (1994) found high levels of extraversion in a Canadian study of rock and country musicians, reporting that “such musicians tend to be more arrogant, dominant, extroverted, open to experience and neurotic than university males” (p. 168). But common sense might call these results into question, as musicians filled out

personality forms at venues where they were playing while on break or when done; typically noisy, highly-stimulating environments where musicians might be biased to respond in more extroverted ways. Gillespie and Myers (2000) recruited a sample of 100 rock musicians from the Sydney Australia metropolitan area and measured them on the Big Five dimensions of personality using the NEO-PI-R. While this sample of 92 males and 8 females did not deviate significantly from population norms on Extraversion, they were significantly higher on Neuroticism and Openness, and significantly lower on both Agreeableness and Conscientiousness.

No clear, unified, picture has emerged from studies like those above regarding the personalities of musicians. They have used different instruments in different settings on different kinds of samples. No one study has examined all kinds of musicians by occupation (i.e., performers as well as conductors and those in other roles) across musical genres. It is not therefore surprising that no unified comprehensive picture of musicians has been developed. This current state of affairs is well summarized by Woody II (1999) in his analysis of the developmental etiology of the musical temperament:

As revealed by the dates of relevant publications, there have been decades of rather extensive research devoted to parceling out the musician's personality factors. It is an understatement to assert that the quest has resulted in more questions than answers, more contradictions than conclusions. Regrettably, it seems that there is relatively little, perhaps no, unassailable empirical support for believing that there are personality characteristics unique to musicians. This negative conclusion is most likely due to the shortcomings of research design and methodology that have been used. The array of variables essential to analysis of the personality stymies even the well-designed studies (p. 247).

Chapter 3

Method

Creation of an Internet-Based Survey

To obtain a large and diverse sample of musicians, the researcher created an Internet-based survey using commercially available software. HTML pages were published on a PC and uploaded to a Linux web server. With the exception of four items that required the musician to type in numerical answers and a final optional open-ended text box for musician comments, the survey consisted of closed-end style multiple choice questions (i.e., *radio button* style items, most often in grids of similar items with common anchors) or dropdown menu items that were responded to with the computer's mouse. The final survey consisted of 219 items and took approximately 30 minutes to complete.

The researcher studied available statistics to determine the sizes of computer monitors in use by the general public. The survey was configured to be displayed on monitors of varying sizes and resolutions, and to be compatible with a variety browsers. Pages were configured so as to minimize the need for scrolling.

All items required responses such that a musician could not proceed to the next survey page or submit the completed survey unless all questions were answered. As such, the study contained no missing data items.

Recruitment of Participants

Participants were recruited in a variety of ways. The researcher initially invited musician friends and acquaintances to take the survey. This produced only a few initial survey responses. The researcher also networked with non-musician friends, asking them

to pass along e-mail invitations to musicians they knew. This allowed for early feedback that the survey was working and that items made sense.

Musicians were then sought in larger numbers. The researcher culled musician names and e-mails from a variety of online sources (e.g., websites of music faculty at universities and music conservatories, hosted websites of individual musicians, online societies of musicians, websites of bands and orchestras). The researcher created a simple database consisting of text files with musician names and e-mail address fields along with a suite of C programs and Linux Shell scripts to send out bulk e-mail invitations. The database logged outgoing invitations using e-mail address as a key and performed a check against a growing list of sent e-mails so as to avoid sending duplicates.

Some websites do not publish the e-mail addresses of musicians but instead provide text dialog boxes for communication with the public; this was not uncommon among well-known musicians and some elite music conservatories (e.g., New England Conservatory of Music at the time of recruitment), where there appears to be a trend toward protecting privacy. In such cases the researcher copied and pasted invitations into faculty dialog boxes. In other cases, such as the Julliard School in New York, there was no direct means of contacting faculty electronically. In a more recent visit to its website the researcher found that the New England Conservatory of Music has now eliminated even the dialog box means of communicating with faculty; it would appear that privacy is an issue of growing concern for many institutions making studies of this nature more challenging.

The researcher attempted to gain access to the more than 90,000 North American members of the American Federation of Musicians (AFM). Two proposals were brought

before the AFM International Executive Board but they were both denied. Little feedback was given, but the AFM protects its members from nonessential communications and protects their privacy, and it appears they were simply not interested in anything that did not relate to their immediate concerns. However, support was graciously provided by the president of Philadelphia Local 77, Joseph Parente, who made possible the posting of a text box with a short blurb and a link to the study on his organization's home page, <http://www.local77afm.org/>. This would prove to be extremely useful in lending legitimacy to the study, as many musicians were hesitant to fill out an online questionnaire with attitudinal, behavioral, and demographic items, even though anonymity was insured.

To lend further credence and visibility, the researcher created an informational homepage on a University of Pennsylvania server, <http://musicianstudy.gse.upenn.edu/>, providing background on the study, a photo of the researcher, as well as links to the Philadelphia AFM homepage, to the study itself, <http://www.musicianstudy.org/>, and a link to the IRB at the University of Pennsylvania that approved the study, <http://www.upenn.edu/regulatoryaffairs>. The researcher found that a confluence of reliable reference points was helpful in proving to a justifiably wary public that the study was legitimate, this after a highly suspicious reception when posting to the Yahoo discussion group named Orchestralist; a group comprised mostly of professional orchestra musicians and composers with URL <http://www.orchestralist.net/olist/index.php>.

Other musical organizations were contacted as well. The researcher explained the study to administrators of numerous orchestras and in some cases they agreed to pass

along generic e-mail invitations to musicians. Downbeat Magazine, the premiere magazine for jazz musicians, published an announcement of the Musician Study in the November, 2007 issue. The College Music Society, <http://music.org/>, an organization of college music professors, approved the study and sent a bulk e-mail announcement to over 9,000 members, this in response to a formal written application detailing the study. This e-mailing caused a one to two week spike in responses, as completed surveys jumped from about 250 to over 500 in March, 2008. Polyphonic.org, a forum for orchestral musicians, assisted by posting an announcement to its membership at <http://polyphonic.org/>, resulting in a smaller but still noticeable jump in completed surveys.

To further maximize recruitment, the researcher created two web pages so that musicians might refer others to the study by entering their e-mail addresses into a text box. One was designed as a *Thank You* page that greeted musicians upon completion of the survey, while the other was a generic referral page that anyone might use. The two referral pages generated a total of 1,561 e-mail referrals, of which 925 included an optional message from the referring musician that further personalized new invitations at a rate of 59%.

As expected, the number of protocols completed exceeded the several hundred needed to perform cluster and factor analyses. This expectation was based on a validation study of a Web-based personality inventory, in which 23,994 protocols were obtained without any subject solicitation (Johnson, 2004). A total sample of 1,405 musicians completed the survey, 476 women and 910 men, age 17 to 86 ($M = 44.8$, $SD = 12.7$). This represents an 84% completion rate based on the 1,680 people who began taking the

survey online, as determined by the survey data file which recorded the initiation of every survey response.

Protection of Research Participants

All data was collected over the World Wide Web through an interface that did not require a participant's name, telephone number, or other unique identifiers. The process required only an e-mail address as a means for sending a unique link to a respondent. The publisher of the NEO-FFI required a secure website along with a mechanism preventing the general public from viewing and downloading copyrighted items, so the survey could not be posted for open access. Each participant had to submit their e-mail addresses in a text box. This event triggered a software application which then sent an encoded link to the participant as part of an e-mail message. The participant clicked on the link in their e-mail to access an instance of the survey. The researcher never had access to any e-mail addresses as they were deleted automatically by the application upon sending a link. Some musicians typed questions about the study in the optional comment field, not realizing that the researcher would have no way of responding to them.

Measures

To view all survey items, with the exception of items from the proprietary NEO-FFI personality instrument, see Appendix A. An overview of the various measures is presented here. Lists of categories for primary and secondary musical instrument as well as primary and secondary musical style were implemented as drop-down menus and are therefore not visible in Appendix A, which roughly mirrors the appearance of the online survey. They are listed in Appendix B and Appendix C respectively.

Demographics. Survey items collected data on state/province, race, gender, age, marital status, number of children, educational qualifications, and income.

Musical background. Twenty items collected data on background information, such as possession of degree or diploma in music, parental musical history and supportiveness, age at which the musician turned professional, years as a professional, AFM membership, primary and secondary musical styles/instruments/occupational roles, improvisation, and absolute pitch (i.e., *perfect* pitch).

NEO-FFI. The 60-item Five Factor Inventory, a short form of the NEO Personality Inventory, measured the Big Five dimensions of personality consisting of Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C). Whereas the NEO-PI-R produces facet scores (a total of 30, six per dimension) as well as the five factors, the NEO-FFI produces scores only on the five scales, each based on 12 items. Coefficient alpha, a measure of internal consistency, was reported by the manual at .86, .77, .73, .68, and .81 for N, E, O, A, and C respectively, with only the Agreeableness scale showing marginal internal consistency of $< .70$ (Nunnally, 1978). The NEO-FFI demonstrated test-retest reliabilities of .79, .79, .80, .75, and .83 for N, E, O, A, and C respectively using college students ($N = 208$) after three months. The NEO-FFI comported well with the full NEO-PI-R, with correlations of .92, .90, .91, .77, and .87 for N, E, O, A, and C respectively, using subjects from the Augmented Baltimore Longitudinal Study of Aging (ABLSA); part of the original normative sample. This is significant, because the NEO-PI-R is a well-studied instrument, nationally normed according to U.S. census data (500 men, 500 women) that has demonstrated high reliability as well as convergent and divergent validity with

numerous other measures (Costa & McCrae, 1992, p. 43; Botwin, 1995). According to the test's authors, "On average, the shorter scales of the NEO-FFI appear to account for about 85% as much variance in the convergent criteria as do factor scores. As is true in all cases where abbreviated scales are formed, some precision is traded for speed and convenience" (Costa & McCrae, 1992, p. 54). The NEO-FFI represented a practical alternative to the longer NEO-PI-R for this study insofar as it takes 10-15 minutes to complete. The NEO-FFI is important to the current study insofar as five dimensions of personality were used to cluster musicians for the purpose of creating a typology of musicians. Raw NEO-FFI scores were summed as per the instructions in the test booklet and converted to T scores using means and standard deviations published in the manual.

Musician Sources of Pressure Instrument. Musicians responded to 55 items describing sources of pressure in their lives as musicians. Items were based closely on those used by Wills and Cooper (1988), although the instrument presented simplified anchors. Instead of using a 5-point Likert scale with extremes ranging from *No pressure at all* to *A great deal of pressure*, plus a response category for Not applicable, NA, the current instrument used a 3-point scale with anchors, *No pressure*, *Moderate pressure* and *A great deal of pressure*, this to lessen the cognitive demands placed upon respondents taking a lengthy survey. Instead of a *Not applicable* category the instructions directed participants to chose *No pressure* if a source of pressure did not apply to them.

Where appropriate, common British terms were replaced with their American counterparts (e.g., "sacked" became "fired", "take holiday" became "take vacation", etc.). Two new items measured stresses related to composing music: "Having to compose

music on a deadline”, and “Worrying that the music you compose may not be commercially successful.”

To determine if there were latent factors that could explain different kinds of stressors experienced by musicians, exploratory factor analysis was performed on the Musician Sources of Pressure Instrument using an iterative common factor approach on a smoothed polychoric matrix. Confirmatory procedures were then applied. This is discussed in greater detail below.

Psychosomatic Troubles Instrument. A new instrument was derived from the Modified Gurin Psychosomatic Symptom List. The original Gurin list of 24 health complaints was first published by the U.S. Joint Commission on Mental Illness and Health (Gurin, Veroff, & Feld, 1960). A modified version, using slightly different items was adopted in a study of British popular musicians (Wills & Cooper, 1988). Twenty items used a 5-point Likert scale with anchors *Never*, *Rarely*, *Sometimes*, *Often*, and *Always*. Four additional items required *yes/no* responses. The four *yes/no* responses were arbitrarily assigned scores of 2 and 4 respectively in the original study but no psychometric rationale was given for doing so (see Gurin et al., 1960, p. 205). Factor analysis of the 1960 version produced four scales: (a) psychological anxiety, (b) physical health, (c) immobilization, and (d) physical anxiety (Gurin et al., 1960, p. 185). However correlations among these scales were as high as .39 and simple structure was not obtained (see Gorsuch, 1983). Some factors also had only two items each.

The current study included a shortened instruction that stated “Please indicate how often you have experienced the following troubles during the past THREE MONTHS”, as opposed to the original: “Below is a list of different troubles and complaints which

people often have. Please circle the number which best reflects how often you have felt like this during the last *three months*” (Wills & Cooper, 1988, p. 127). The items themselves were abbreviated to just the symptom (e.g., “How often are you bothered by having an upset stomach?” became “Upset stomach”, “Do you ever just want to be left alone?” became “Wanting to be left alone”, etc.) in accordance with the goal of minimizing the time needed for reading.

As in the Musician Sources of Pressure Instrument, the current instrument replaced the original 5-point Likert scale with a 3-point scale consisting of anchors *Never*, *Sometimes* and *Often*, extending the same rationale of limiting time and cognitive demands placed upon participants. The new instrument included only the 20 items corresponding to the ones that had been on a 5-point scale. The four yes/no items pertained to chronic health conditions. Unlike the other items they did not measure specific symptoms occurring during the past three months, and were therefore excluded.

Because of these changes, the modified version was factor analyzed anew using the musician data collected. The exploratory factor analysis and subsequent confirmatory analyses employed the same techniques as described for the Musician Sources of Pressure Instrument, to be discussed in greater detail.

Additional survey items. Survey type items collected variables on current musical activities, coping behaviors, cigarette smoking, drug and alcohol use, and overall career satisfaction. Several of these items will be used in future research.

Optional comment field. As mentioned, the last item had the distinction of being both open-ended and optional. Similar to the final item used by Wills and Cooper (1988), the item was worded:

Thank you for completing this survey. Please type below any other comments you may wish to add, e.g., other stressful factors in your life and work not mentioned in the survey. Any general comments regarding this study or your life as a musician are also welcome.

Out of the 1,405 completions 405 comments were left; a commenting rate of 29%.

Data Analyses

Overview. The Musician Study created a typology of musicians based upon five dimensions of personality as measured by the NEO-FFI. To achieve this, a multistage hierarchical clustering method grouped musicians according to their scores on the five dimensions. Other variables and derived latent measures external to the clustering process made possible an explication of the types produced. To best achieve this goal exploratory factor analysis produced two new scales, one for the purpose of measuring sources of occupational pressure for musicians (i.e., *stress*) and the other for measuring general psychosomatic troubles. As discussed, both of these new scales derived their items from prior work. The creation of both scales proceeded using the same exploratory, confirmatory, and scaling methodologies; a hybrid of classical exploratory factoring techniques, structural equation modeling, full information bifactor analysis, and IRT scaling procedures. Typal explication proceeded with the standard error of proportional differences to measure within-cluster deviance from expected prevalence rates. MANOVA and subsequent step-down univariate tests measured between-cluster differences. Descriptive statistics revealed general characteristics of the musician sample and canonical analyses were run to explore relationships between the NEO-FFI dimensions and explicating variables.

Descriptive statistics. Initial data analyses consisted of basic descriptive statistics, as in the study by Wills and Cooper (1988). Frequency distributions were produced for

geographic region, race, gender, age, marital status, educational attainment, income, number of children, age turned professional, years worked as a professional, and non-musical work.

Exploratory factor analyses. Because of the categorical nature of the data on both the Musician Sources of Pressure Instrument and the Psychosomatic Troubles Instrument, classical factoring approaches did not offer the current best solution for these exploratory analyses. Classical factor analysis was designed for continuous data, not categorical data (McLeod, Swygert, & Thissen, 2001, p. 197), and spurious results have been noted when ordered categorical item data have been treated as continuous data (Bernstein & Teng, 1989; Bock, Gibbons, & Muraki, 1988; McDonald & Ahlawat, 1974; McLeod, Swygert, and Thissen, 2001; Mislevy, 1986; Mooijart, 1983; Muthen, 1989; Waller, 2001). Pearson product-moment coefficients become too small when items of disparate difficulty levels are correlated, tending toward the formation of difficulty factors.

Bock, Gibbons, and Muraki (1988) described another exploratory approach for multidimensional dichotomous data known as full information item factor analysis. Whereas in classical factoring approaches correlations between items are analyzed to produce factors, full information factoring is an item response theory (IRT) approach that uses all the information present by modeling the raw item responses and not just item correlations, hence the term *full information*.

Full information factor analysis has also been developed for polytomous items using the graded response model (Muraki & Carlson, 1995), although commercial software for the procedure was not available at the time of this analysis. As a best alternative, Knol and Berger (1988, 1991) found that iterated common factoring of a

smoothed tetrachoric matrix produced results most similar to full information factoring; a finding that generalizes to common factoring of polychoric matrices (McKinley & Reckase, 1983; Waller, 2001).

Exploratory factor analyses (EFA) of the Musician Sources of Pressure Instrument and the Psychosomatic Troubles Instrument thus proceeded on a random subsample of the 1,405 musicians ($N = 705$), with a reserve sample ($N = 700$) being set aside for subsequent confirmatory analyses. Two matrices of polychoric item correlations were similarly computed using MicroFACT software (Waller, 2001), one for the pressure items and the other for the troubles items, both from the exploratory subsample. A goodness of fit index (*GFI*) was produced for each matrix; a value where acceptable results range between .95 and 1.0, higher values being better. These computations employed two-stage maximum likelihood estimation (Olsson, 1979) and smoothing for singularity and positive semidefiniteness (Knol & Berger, 1988). A lower bound on the number of factors was obtained in each case using Velicer's minimum average partialling (MAP; 1976) and iterative principal factoring was applied to each of the polychoric matrices in separate analyses. Initial communality estimates consisted of squared multiple correlations in factoring each matrix.

To determine the ideal factor structure varimax and equamax orthogonal rotation and promaxian oblique rotation at several powers was attempted for various numbers of factors. Ideal factor structure is defined so as to satisfy several criteria: (a) Maximization of hyperplane count as per Yates (1987) and adequate item coverage to best achieve simple structure, (b) maximization of the Goodness of Fit (*GFI*) index and minimization of the root mean square residual (*RMSR*; Waller, 2001), (c) a minimum of 4 salient

loadings per factor where saliency is defined as factor loadings $\geq .40$, (d) indices of internal factor reliability $\geq .70$, and (e) a parsimonious solution, interpretable, and theoretically plausible, with adequate coverage of items, such that the latent variable model comports well with existing research and contains as many meaningful factors as can be reliably extracted; a heuristic emphasizing the avoidance of factor underextraction while maintaining only those factors with adequate loadings (Fabrigar, Wegener, MacCallum, & Strahan, 1999, pp. 277-281).

Confirmatory analyses. Confirmatory factor analyses (CFA) proceeded on the reserve sample ($N = 700$) using structural equation modeling software (EQS) to test the two factor structures obtained in the exploratory phase (see Byrne, 2001). Tests employed conservative indices to ensure adequate model fit, with Comparative Fit Index (CFI) $\geq .95$ and Root Mean Square Error of Approximation ($RMSEA$) $< .06$ (Hu & Bentler, 1999). Where group factors were found, full information bifactor analysis tested for the coexistence of a general factor (Gibbons, Bock, Hedeker, Weiss, Segawa, Bhaumik, Kupfer, Frank, Grochocinski, & Stover, 2007; Gibbons & Hedeker, 1992). Testing of chi-squared deviance and factor loading saturation contrasted the explanatory power of bifactor and unidimensional models.

Scaling. PARSCALE, a Windows software application (Muraki & Bock, 2003; Thissen & Wainer, 2001, p. 150), employed Samejima's graded response model to produce scaled scores ($M = 50$, $SD = 10$) for each group and general factor found (Samejima, 1996). Score calculations proceeded according to expected ex posteriori (EAP) Bayesian estimation, found to produce more reliable estimates by Thissen and

Wainer (2001, pp. 370-373). Additional codes (McDermott, 2008) estimated composite reliability (ideally $\geq .70$) and maximum test information for each factor.

Multistage hierarchical cluster analysis. To produce a typology of musicians, a multistage Euclidian grouping (MEG) procedure sorted musicians according to their profiles on the five NEO-FFI dimensions (MEG; McDermott, 1998). Cluster analysis was appropriate given its algorithmic sensitivity to level, shape, and dispersion and given the complexity of multivariate profiles (Alterman, McDermott, Cacciola, Rutherford, Boardman, McKay, & Cook, 1998, p. 415).

Three objectives in clustering a heterogeneous sample of musicians were typological distinctiveness, replicability, and full coverage (Alterman et al., 1998; McDermott & Weiss, 1995). Distinctiveness indicates that within-cluster profile similarity is maximized and between-cluster similarity is minimized. Replicability denotes the parallel emergence of similar clusters among randomly partitioned subsamples of roughly equal size when submitted to parallel clustering processes. Higher replication rates support the plausibility of emergent types and point to more robust solutions, less likely to be driven by chance and sampling error. The concept of full coverage indicates that a typology is representative of all cases in a population, inclusive of all profile types in the process of cluster formation, free from arbitrary exclusion and able to classify rare types. Several authors have noted the importance of full coverage in achieving a representative typology (see Alterman et al., 1998, p. 415; McDermott & Weiss, 1995, p. 164). To meet these research objectives Ward's minimum-variance agglomerative clustering was chosen as per its ability to recover known typological structure and for achieving full coverage, this within the context of a three-stage

exploratory process facilitating the goals of distinctiveness and replicability (McDermott & Weiss, 1995).

The three-stage process began with the random assignment of 1,405 profiles to seven blocks, each of size 200 or 201. In stage one, fusion statistics for each block signaled a plausible number of clusters based on the following criteria: (a) elevated pseudo- F statistic with regard to pseudo- t^2 statistic (Cooper & Milligan, 1988), (b) precipitous decrease or tipping point of downward inflection without recovery in overall between-cluster variance (R^2) as observed graphically and numerically, concomitant with within-cluster error variance increase, and (c) Mojena's stopping rule one expressed in standard deviate form (see MEG; McDermott, 1998, p. 679). First stage clustering applied these stopping criteria independently to each block, resulting in the selection of seven nascent cluster solutions.

Because Ward's minimum-variance clustering is highly sensitive to outliers, the most atypical 1% (approximately) of participant profiles were eliminated via the SAS option TRIM = 1, as set when running PROC CLUSTER during stage one (see Burnham, Schaefer, & Giesen, 2006). After trying various settings, the researcher chose this setting because it eventually led to a statistically sound typal solution while eliminating only 19 profiles (1.35%) from the original 1,405 completed surveys. While higher trim settings are not uncommon, elimination of only 19 profiles was in keeping with the goal of creating a typology based on a heterogeneous sample. Discussion regarding the post-trim sample hereafter refers to the remaining $N = 1,386$ musician profiles.

Second stage clustering commenced by pooling first-stage clusters and submitting them again to Ward's method in the form of a similarity matrix that recorded "full first

stage history” (i.e., block of origin, cluster mean-profiles, radial and dispersion statistics, and within-cluster profile frequency) as per Alterman et al. (1998, p. 415). The same fusion criteria were applied as in stage one. This stage generated useful statistics allowing several attempted cluster solutions to be evaluated on the basis of homogeneity (H) for each cluster (i.e., within-cluster tightness of fit indicating distinctiveness).

Stage three clustering compensated for the prospective nature of the agglomerative process to this point, allowing profiles to migrate to final clusters representing a best fit. Ward’s agglomerative clustering does not retrospectively search for optimal profile matches once a profile has been absorbed, there being no backward-looking mechanism. Stage three clustering allowed for profile relocation using divisive k-means iteration, as applied in previous typological studies (see MEG; McDermott, 1998; McDermott & Weiss, 1995, p. 164; Alterman et al., 1998, p. 415). In addition to the clustering criteria used in stages one and two, stage three applied additional conservative criteria, as discussed by McDermott and Weiss (1995): (a) an average within cluster homogeneity coefficient $\overline{H} \geq .60$, (b) an average between-types homogeneity coefficient $\bar{r}_p < .40$, and (c) replication rates of $> 50\%$ for all final clusters.

Upon completion of stage-three relocations, the replication rate for each final cluster was calculated as the percentage of stage-one blocks from which at least one cluster had been absorbed. Since minimum-variance criteria are operational throughout the application of Ward’s method, and since replication rates are measures of the independent emergence of like clusters as defined by their propensity for fusion, a high replication rate for a final cluster strongly mitigates the possibility that it was formed by chance. In this study, a 100% replication rate for a final cluster signified that it had

absorbed at least one cluster from each of the seven randomly formed blocks. MEG produced a homogeneity coefficient for each cluster (H) such that 1.0 would represent perfect within-cluster homogeneity, 0.0 would represent average homogeneity over the entire data set, and -1.0 would represent marked disparity of profiles (MEG; McDermott, 1998, pp. 679-680). Given the exploratory nature of the study and given that musicians have never been clustered in this fashion, the psychological interpretability of the typology, its parsimonious coverage of the data, and its compatibility with existing data on musicians could not be determined at the time of clustering, rather being left to the typal explication phase.

Typal explication. Various survey variables and derived scales were used as external validator variables to differentiate and thus explain the nature of the types produced. Within-type deviations from expected prevalence rates were detected by two-tailed tests of the standard error of proportional differences (Ferguson & Takane, 1989). Pairwise testing proceeded across all categories of criterion variables where cell frequencies were 10 or greater (Stokes, Davis, & Koch, 1995). Bonferroni corrections adjusted conservatively for Type I error, dividing nominal alpha levels by the number of pairwise contrasts.

Binary survey variables consisted of AFM membership, gender, possession of a music degree/diploma, and taking work outside music on leaving school. Some variables with more than two nominal response categories were analyzed as collected (e.g., marital status, primary musical instrument, primary and secondary musical occupations, and primary musical style).

Other variables, ordinal or continuous, were bifurcated at cut points found to reveal interpretable and significant within-type contrasts, in many cases leading to more parsimonious results by consolidating multiple contrasts at successive levels of the same variable. Bifurcated variables consisted of: (a) musician age greater than or equal to 45 ($M = 44.7$), (b) age turned professional 18 or under, (c) having no children versus having one or more children, (d) current cigarette smokers versus non-smokers, (e) cigarette smoking of one pack per day or more versus lower or no usage, (f) father's musical history as pro/semipro versus lesser musical involvement, (g) several alcoholic drinks or more per week, (h) strong agreement versus lesser agreement in enjoyment of work as a musician, (i) 35 or more hours per week of non-musical work, (j) improvisation seen as important or very important versus not or somewhat important, (k) good or exceptional ability as an improviser versus lesser ability, (l) income of \$60,000 or more, (m) mother and father respectively *Supportive* versus anything but supportive, (n) possession of perfect pitch versus *No* or *Don't know* responses, (o) satisfaction with current musical activities at the level of agree or strongly agree versus lesser levels, (p) primary musical style classical versus non-classical, (q) 24 or more years worked as a professional musician, and (r) highest educational qualification at the graduate school level (i.e., master or doctoral degree) versus other levels of attainment. Distribution and significant prevalence findings are provided in Appendix F.

Between-type differences were detected through two MANOVA analyses with type membership as the independent variable. Dependent variables consisted of scaled scores from the Musician Sources of Pressure Instrument and the Psychosomatic Troubles Instrument. Highly correlated group and general factors on the Musician Sources of

Pressure Instrument were assigned to separate analyses. Tukey post-hoc honest significant differences (HSD) were examined following significant multivariate and univariate step-down tests for each analysis as per Alterman et al. (1998, p. 416).

Canonical analyses. Two canonical analyses were performed to reveal the bimultivariate relationships between the five NEO-FFI personality dimensions and scores derived from the Musician Sources of Pressure Instrument and the Psychosomatic Troubles Instrument. The first analysis examined relationships between the NEO-FFI and group factors that were found. The second analysis examined relationships between the NEO-FFI and general factor scores. Redundancy statistics revealed the percentage of variance in the newly scaled factor scores explained by the NEO-FFI, and vice versa.

Research Hypotheses

Hypothesis I: Based on the work of Wills and Cooper (1988), it was hypothesized that the 55-item Musician Sources of Pressure Instrument is not unidimensional, and would yield several latent constructs. Wills and Cooper factor analyzed their 53-item version to produce 11 factors from a population of 246 British rock, pop, and jazz musicians, which they labeled as follows: (a) Performance Anxiety, (b) Work Over/Underload Related to Traveling, (c) Performance-Related Anxiety, (d) Instruments and Equipment, (e) Career Development, (f) Poor Physical Work Conditions, (g) Effects on Social and Family Life, (h) Playing Disliked Gigs, (i) Things Going Wrong on the Gig, (j) Conflicts within a Band, and (k) General Relationships in the Working Situation (p. 93).

In the current study items were used with a large North American sample, expected to be more diverse in terms of musical styles and musical occupations (i.e., performers as

well as non-performers). New items were added and old ones modified. The new exploratory factor analysis attempted to discover latent variables or factors that might parsimoniously explain variance among the items using this larger more heterogeneous population.

Hypothesis II: Factor analysis of the Psychosomatic Troubles Instrument would yield several latent constructs as measures of health or wellness. Item analysis and exploratory factoring procedures were applied as in *Hypothesis I* with the same goal of determining if the items can be parsimoniously summarized by a smaller set of latent variables, or if item variance is best summarized by a unidimensional factor.

Hypothesis III: Cluster analysis based upon the Big Five dimensions of personality would produce a typology of musicians in which some of the clusters would contain significantly greater proportions of musicians at risk for stress-related illness. A central aspect of this study is the creation of a typology of musicians based upon personality variables. In selecting conceptually related, similarly scaled, normed, reliable, well-validated, and well-studied dimensions as input variables for the megacluster hierarchical clustering procedure, it was hoped that the resulting typology would be psychometrically valid, interpretable, and finally illuminating with regard to these groups of musicians. Anderberg (1973) described the classificatory goal of cluster analysis in this way:

The operational objective in this case is to discover a category structure which fits the observations. The problem is frequently stated as one of finding the “natural groups”. In a more concrete sense, the objective is to sort the observations into groups such that the degree of “natural association” is high among members of the same group and low between members of different groups” (p. 2).

Describing each type (i.e., each final cluster) with factors from the Musician Sources of Pressure Instrument and the Psychosomatic Troubles Instrument would reveal which types report higher levels of stress and more numerous health symptoms. Mean scores will be given for each factor across types.

Hypothesis IV: Relationships exist among explicating variables and personality dimensions such that higher scores on Neuroticism are associated with higher levels of stress and poorer health. In using sources of pressure and health symptom variables to explain a typology of musicians, it is important to consider possible underlying relationships among those variables that are presumed to explicate *natural types* and those variables that are presumed to cluster into those *natural types*. The relationship between individual characteristics, particularly the ways in which individuals appraise and react to potential stressors, and the outcomes of stress in terms of coping mechanisms, strains, and disease, lies at the heart of transactional models of stress as a complex of cumulative processes over time; a view which banks upon aspects of human temperament having to do with emotional stability (Beehr & Bowling, 2005; Cooper & Bright, 2001; Cooper & Dewe, 2004; Costa and McCrae, 1992; Jones & Kinman, 2001; Kasl & Rapp, 1991; Laungani, P., 2005). In reviewing the construct validity of various symptom checklists Pennebaker (1982) underscores the reactivity of some persons to the measurement of health symptoms:

A particularly interesting quality of each of these scales is that each is internally consistent, meaning that a person who reports any one particular symptom is likely to report others. The tendency to report symptoms, then, can be viewed as a stable unidimensional construct. This is true even though the symptom inventories have been devised and used for very different purposes (p. 134).

Thus, if perceived stress and self-reported symptoms are used as explicating variables with regard to a typology based upon personality, it is important to understand the extent to which these self-report measures may be related to personality itself.

To better understand these effects on the variables of interest in this study, canonical correlations between personality dimensions and stress factors and between personality dimensions and symptom factors were assessed. To the extent that corresponding pairs of extracted canonical variates correlate highly, each canonical variate being a linearly weighted composite of variables from a set of conceptually related variables (e.g., the Big Five personality dimensions), the two sets of variables may be seen as *redundant*, explaining much of the same variance (Tabachnick & Fidel, 2001, p. 190). Canonical correlations and canonical loadings (i.e., correlations between individual variables and their canonical variate) are reported in this context.

Chapter 4

Results**Descriptive Statistics**

Overview. Simple statistics are presented in this section for the post-trim sample ($N = 1,386$) since the typology was based on this group. Several comparisons are made with the study of popular musicians in Britain by Wills and Cooper (1988) in which similar variables were collected.

Region. As shown in Table 1, responses came from every major region of the United States plus Canada. More than 50% of responses originated in the Northeast and the South.

Table 1

Percentages and Frequencies for Major Regions in the USA plus Canada

Major Census Region	%	Frequency
Northeast	26.2	363
South	26.0	361
Midwest	20.3	281
West	19.9	276
Canada	5.6	78
Other	1.9	27

Note. $N = 1,386$.

Race. Table 2 presents percentages and frequencies for race. Despite efforts to recruit a wide variety of musicians using various means, minority musicians were underrepresented in this study.

Gender. Approximately two-thirds of the post-trim ($N = 1,386$) musicians were

Table 2

Racial Composition of Musicians

Race	%	Frequency
White	92.9	1287
African American	1.2	17
Hispanic	2.2	31
Asian / Pacific Islander	1.7	23
American Indian / Alaskan Native	0.1	2
Other	1.9	26

Note. $N = 1386$.

male (see Table 3). PROC CLUSTER trimmed 13 males and 6 females leaving the percentages essentially unchanged from the full sample collected ($N = 1,405$).

Age. As shown in Table 3, the sample contained more musicians in the older age ranges, with 64% age 40 or older and 41% age 50 or older. Only 15% were under 30 years of age. Means, medians, and standard deviations were computed for the whole sample ($M = 44.8$, $Mdn = 46.0$, $SD = 12.7$), males ($M = 46.5$, $Mdn = 48.0$, $SD = 12.3$), and females ($M = 41.4$, $Mdn = 40.0$, $SD = 12.9$).

Marital status. Only 12.9% of the entire sample was separated or divorced (see Table 3), matching closely the 12.5% found by Wills and Cooper (1988). This is lower than estimates for the USA and Canada. Also as found by Cooper and Wills, the highest numbers of those separated or divorced in this study were in the age range of 40 to 59, comprising 8.8% of the total sample. Of current participants aged 40 to 49, 13.62% were separated or divorced, while 19.12% were separated or divorced for ages 50 to 59. Wills and Cooper reported statistics of 19.2% and 18.4% respectively for the same age ranges.

Table 3

Personal Demographics for Main Sample of Musicians

Gender	%	Frequency	Number of children	%	Frequency
Male	65.6	910	None	54.6	756
Female	34.3	476	One	15.3	212
			Two	19.9	276
			Three	6.2	86
			Four	2.7	37
			Five or more	1.4	19
Age	%	Frequency	Educational level	%	Frequency
< 20	0.5	7	None	0.6	8
20-29	14.9	206	High school	11.6	161
30-39	20.6	286	Associates degree	5.0	69
40-49	23.3	323	Bachelors	22.1	306
50-59	29.4	408	Masters	30.5	423
>=60	11.3	156	Doctorate	30.2	419
Marital Status	%	Frequency			
Never married	28.1	390			
Married	57.9	803			
Separated	1.5	21			
Divorced	11.4	158			
Widowed	1.0	14			

Note. $N = 1,386$.

Number of children. The number of children in this sample was consistently lower than in the study by Wills and Cooper (1988) in which 39.2% of the sample had no children as contrasted with 54.6% in the current study. The 246 participants in the earlier

study had a minimum of 286 children, or 1.2 children per musician. The current study's participants had a minimum of 1,265 children or .9 children per musician; a decrease in children per musician at a rate of 25%. Table 3 provides percentages and frequencies from none to five or more children.

Educational level. Whereas the study by Wills and Cooper (1988) had only one doctorate and five masters degrees (2.6% of that sample), in the current study more than 60% of the musicians had a graduate degree, with approximately 30% holding a doctorate (see Table 3), making this a highly educated sample. This probably results from the high response level following the e-mail sent by the College Music Society to its membership. Judging also from the electronic referrals, many of which contained comments for the referees, it appears that many musicians from this group found the study interesting and referred their colleagues. For the full sample, 73.2% of musicians had a music degree or diploma. The percentage of participants with a music degree or diploma increased with educational level (3.7% for high school, 29.0% for an associate degree, 70.6% for bachelor's degree, 89.1% for master's degree, 94.5 for doctoral degree). The survey however did not ask if the highest degree achieved was in music, so this is not necessarily the case.

Age turned professional. Responses to the question "At what age did you become a professional musician?" ranged from 3 to 57 ($M = 20.3$, $SD = 5.6$). Ninety-six responses of zero indicated that those participants never became professional musicians, as per the instructions in the question, "enter 0 if never a professional musician" (see Table 4).

Years worked as a professional. Responses to the question, "How many years have you worked as a professional musician?" ranged from .5 to 64 ($M = 23.9$, $SD =$

Table 4

Age Turned Professional

Age Turned Pro	%	Frequency
Never	6.9	96
20 or younger	52.5	728
21-25	30.6	424
26-30	6.5	90
30 or older	3.5	48

Note. $N = 1,386$.

13.5). One-hundred responses of zero indicated that those participants had spent no years working as professional musicians, as per the instructions in the question, “enter 0 if none”. Table 5 presents percentages and frequencies for the zero option and 10-year intervals through *More than 50*.

Table 5

Years Worked as a Professional

Years As Pro	%	Frequency
0	7.2	100
1-10	20.5	284
11-20	19.8	274
21-30	21.4	297
31-40	21.3	295
41-50	7.9	109
More than 50	1.9	27

Note. $N = 1,386$.

Weekly hours currently worked in non-musical job. Within the trimmed sample ($N = 1,386$) 70% of respondents worked no hours per week at non-musical jobs, as per

the question, “How many hours per week do you currently work in a non-musical job? (enter 0 if none)”. Participants worked an average of 8.4 hours per week in nonmusical jobs ($Mdn = 0.0$, $SD = 14.2$). Table 6 contains percentages and frequencies in ranges of 10 hours and includes the category of zero hours worked in jobs other than musical ones.

Table 6

Weekly hours worked in non-musical job

Hours Worked	%	Frequency
0	70.2	973
1-10	5.7	79
11-20	6.1	84
21-30	4.0	56
31-40	11.3	157
> 40	2.7	37

Note. $N = 1,386$.

Income. The survey stored grouped income data as a categorical variable ($M = \$50,050$, $Mdn = \$46,982$) as shown in Table 7. The highest income level of \$100,000 or more served as a catch-all category and appears to exhibit a ceiling effect as per the unusual jump in the high end of the frequency distribution.

Factor Analysis and Scaling of the Musician Sources of Pressure Instrument

Exploratory analysis. Velicer’s Minimum Average Partial Test (MAP) estimated a lower bound of eight factors for extraction from the smoothed polychoric matrix ($GFI = .98$) of 55 items. Iterative factor solutions were attempted for 1-9 factors and evaluated using the criteria for ideal factor structure. However, these solutions produced one or more unreliable factors when submitted to scaling, or factors with fewer than 4 salient loadings. Examination of unreliable factors revealed two outlier items by virtue of high

Table 7

Income in U.S. Dollars

Income	%	Frequency
Less than \$10,000	7.9	109
\$10,000-19,999	9.3	129
\$20,000-29,999	11.0	152
\$30,000-39,999	13.3	185
\$40,000-49,999	12.2	169
\$50,000-59,999	12.3	171
\$60,000-69,999	9.2	127
\$70,000-79,999	7.0	97
\$80,000-89,999	5.4	75
\$90,000-99,999	2.6	36
More than \$100,000	9.8	136

Note. $N = 1,386$.

kurtosis (i.e., distributional peakedness) and constrained variance: (a) “If you are a member of a famous group, feeling that this puts special pressures on you”, and (b) “Feeling that you have reached the top too soon”.

After removal of these items, a new smoothed polychoric matrix of 53 items exhibited the same *GFI* of .98 and produced the same MAP estimate of eight factors. A six-factor promax model ($k = 2$) emerged as the best solution, although the sixth factor had only 3 salient loadings and thus was not used later in interpreting results. Because the sixth factor was the last factor to be extracted it did not harm the reliability or interpretability of previously extracted factors. Eleven items failed to produce salient loadings on any factor and were also eliminated from the scale. None of the salient items

loaded on multiple factors so they were all retained. Of the 55 original items, 42 items remained across six factors.

Factor structure. Names were assigned to the five reliable factors based upon high to low order of factor loadings (i.e., those items explaining more of the variance in the factor): (a) Musician Identity (also referred to as Identity; items revealing musicians' feelings about themselves and their music), (b) Work Underload, Benefits, and Pay (also referred to as Work/Pay; concerns about lack of work, benefits, and getting paid), (c) Artistic and Business Relationships (also referred to as Relationships; items dealing with conflict and relationship issues with management and other musicians), (d) Performance Anxiety (also referred to as Performance; pressures such as feeling nervous or tense when playing live or recording, reading difficult parts, auditioning, and the isolation of the recording studio), and (e) Travel and Poor Physical Work Conditions (also referred to as Conditions; travel, poor physical environments, and aspects of shift work). Items and loadings are presented in Table 8.

As mentioned earlier, factor 6 had only three items and was not reliable. These items focused on pressures associated with composing music. More items measuring this domain may have produced a statistically reliable and meaningful factor.

Confirmatory results. CFA on 42 items from the reserve sample indicated good fit for the 6 factor model ($CFI = .948$, $RMSEA = .053$ with 90% confidence limits set at .051 and .056).

Often in measuring a general psychological construct, for example stress experienced by musicians, a multidimensional structure will emerge simultaneously with the general construct, drawing items from multiple subdomains (e.g., Musician Identity,

Table 8

Rotated Factor Structure for the Musician Sources of Pressure Instrument

Item ^a	Loading ^b
Factor 1: Musician Identity	
Musical ability is not appreciated because of the public's ignorance of music	.67
Too intense or honest about your music makes other musicians suspicious	.65
Worrying that your style of music is no longer fashionable	.63
Having to mingle socially with other musicians to keep getting work	.56
Feeling alienated from people who lead a "normal, everyday" lifestyle	.55
Must reach or maintain standards of musicianship that you set for yourself	.52
Worrying that your ability to play will leave you	.50
Personality clashes with, or jealousy of other musicians	.45
Stress on personal relationships due to unusual work hours, long periods away	.43
Coping with criticism in the music press or from other musicians	.42
Coping with a leader whose musical ideas clash with yours	.41
Factor 2: Work Underload, Benefits, and Pay	
Worrying because of the lack of work	.80
Worrying about the lack of pensions and benefits in the music profession	.71
Waiting for payment to come through from a gig, session, or project	.69
Feeling that you need to become better known and/or better paid	.59
Having to work when work available, making it difficult to take vacations	.46
Having to play or work on music you don't like in order to earn a living	.42
Factor 3: Artistic and Business Relationships	
In the recording studio, disagreeing with your producer or engineer	.69
As an artist, conflict with management who do not share your musical ideals	.63
Having to fire a musician	.62
Decisions about your group's musical policy made without consulting you	.57
Hiring musicians on short notice	.54
Worrying about all the musicians getting to the gig on time	.47
Playing is only one part of being a musician	.40

(Table continues)

Table 8 (continued)

Item ^a	Loading ^b
Factor 4: Performance Anxiety	
Feeling tense/nervous when playing a live gig as a session musician	.69
Feeling tense/nervous when playing in recording studio with regular group	.69
Feeling tense/nervous when playing in recording studio as session musician	.69
Feeling tense/nervous when playing a live gig with your regular group	.55
Having to read and play a difficult part at a recording session or gig	.54
Doing an audition	.50
Working in the enclosed and isolated environment of the recording studio	.45
Factor 5: Travel and Poor Physical Work Conditions	
Having to play after traveling a long distance	.68
Doing a long tour	.52
Recording sessions or rehearsals during the day, then having to gig at night	.48
Playing venue with bad conditions, e.g., dressing room, acoustics, small stage	.46
Endangering life by having to drive a long distance after a gig when tired	.45
Effects of noise when the music is heavily amplified	.44
Working at night, often into the early hours	.43
Waiting around for long periods at the gig before it's time to play	.40
Factor 6: Composing ^c	
Worrying that the music you compose may not be commercially successful	.78
Having to compose music on a deadline	.73
Working alone, composing or arranging	.42

Note. $N = 1,405$.

^aItem content is abbreviated in some cases for convenience of presentation.

^bFactor loadings are obtained from promaxian oblique rotation loadings at $k = 2$ with equamax structure as initial orthogonal rotation.

^cFactor 6 is presented only for completeness and was not used in the analysis due to too few items.

Performance Anxiety, etc.). While such an instrument may be designed to measure overall musician stressors, the sampling of “domains within a construct and items within domains” can produce not only a general stress factor, but a number of group factors coexisting with the general factor (see Gibbons et al., 2007, p. 4). As an additional

confirmatory step therefore, two contrasts were performed using full information bifactor analysis to assess the explanatory power of the group factors. The first analysis contrasted a bifactor model using 42 items loading on the group factors with a unidimensional model loading on the same items. The second analysis contrasted a bifactor model in which the 53 original items were allowed to load on the general factor and the unidimensional factor, keeping group factors unchanged. The reintroduction of 11 items that did not load on any of the group factors seemed plausible given appreciable item-total correlations for all the Musicians Sources of Pressure items (i.e., between .20 and .80) as well as a measure of high internal consistency for all 53 items ($\alpha = .93$). Such contrasts can further confirm or negate the explanatory power of the group factors under more stringent conditions as imposed by an orthogonal bifactor model in which all the general and group factors are prevented from correlating (Reise, Morizot, & Hays, 2007).

Under each scenario the bifactor model was superior to the unidimensional model as based on chi-square deviance tests ($p < .0001$ for each contrast), confirming better fit afforded by the group factors. The bifactor model using all 53 items produced slightly better results as indicated by a lower root-mean-square posterior standard deviation. Empirical reliability was also favorably higher for this model ($r = .90$) when compared with the 42-item bifactor model ($r = .87$), although each of the two unidimensional models displayed higher empirical reliability ($r = .94$ and $r = .92$ respectively). Average factor loadings for the general and group factors using 53 items were .47 and .43 with salient loadings on a number of items per factor (in keeping with acceptable criteria as per Gibbons et al., 2007). The general factor shall be referred to as General Musician Pressures, to be interpreted as an overall index of musicians' occupational stress.

Scaling. Five group factors and one general factor from the 53-item bifactor model were individually calibrated and scored using the graded response model and EAP with adaptive quadratures. Mean factor slopes ranged from 1.25 for Performance Anxiety to 0.73 for General Musician Pressures. Mean factor thresholds ranged from 1.12 for General Musician Pressures to 0.48 for Work Underload, Benefits, and Pay. Highest maximum information of 4.52 (the inverse of test error or $1/SE^2$) occurred in the Performance Anxiety dimension at $\theta = 1.47$. Lowest maximum information of .09 occurred in the General Musicians Pressures at $\theta = 1.47$. Composite reliability, a measure of internal consistency, ranged from .80 for Musician Identity to .68 for Travel and Poor Physical Work Conditions, the last of the five interpretable group factors extracted. While this statistic is slightly lower than the desired reliability of .70, the dimension was retained due to its clear interpretability and importance of these items to the study; the items explain close to half of the variance in the factor.

Factor Analysis and Scaling of the Psychosomatic Troubles Instrument

Exploratory and confirmatory analyses. Factor analysis proceeded using the same techniques as described for the Musician Sources of Pressure Instrument. Velicer's Minimum Average Partial Test (MAP) estimated a lower bound of 1 factor for extraction from the smoothed polychoric matrix ($GFI = .997$) of 20 items. Iterative factor solutions were attempted for 1-2 factors and evaluated using the criteria for ideal factor structure. A two-factor oblique solution ($k = 3$) produced maximum hyperplane count and 15 of the 20 items loaded uniquely on the two factors, with five items loading on neither factor. Factor one contained mostly somatic items (e.g., heart racing, spells of dizziness, upset stomach) while the items in factor two were psychological troubles (e.g., mental

exhaustion, wanting to be left alone, unable to take care of things because you couldn't "get going"). However despite good model fit statistics from EQS ($CFI = .99$, $RMSEA = .04$ with 90% confidence interval from .03 to .05), scaling procedures revealed low composite reliability for factor 1 ($r = .55$).

A unidimensional solution was subsequently attempted and found to model the data well, with all 20 items loading saliently (see Table 9). This finding is apparently consistent with Pennbaker's observation that scales devised to measure a variety of symptoms have produced "mixed results", this following from findings that "high

Table 9

Dimension of the Psychosomatic Troubles Instrument

Item ^a	Loading ^b
Mental exhaustion, difficulty concentrating or thinking clearly	0.76
Feeling nervous, fidgety, or tense	0.73
Getting tired very easily	0.70
Spells of dizziness	0.69
Ill health affecting the amount of work you do	0.68
Feeling "let down" by unexpected events	0.68
Lack of appetite	0.68
Being unable to take care of things because you couldn't "get going"	0.68
Nightmares	0.66
Headaches or pains in the head	0.63
Difficulty waking up when have to	0.63
Heart racing	0.63
Upset stomach	0.63
Trembling muscles (e.g., hands tremble, eyes twitch)	0.61
Wanting to be left alone	0.61
Trouble getting to sleep or staying asleep	0.59
Crying easily	0.57
Shortness of breath when not exercising or working hard	0.54
Sweaty hands	0.51
Smoking, drinking, or eating to excess	0.46

Note. $N = 1,405$.

^aItem content is identical to that on the instrument.

^bNon-rotated Factor loadings for unidimensional scale

symptom reporters” tend to perceive higher symptom intensity across a range of symptoms (1982, p. 135). High internal consistency then appears to be a hallmark of symptom checklists, as found to be true in this exploratory analysis. Submitting all 20 items to CFA produced a *CFI* of .98 and *RMSEA* of .048 with a 90% confidence interval of .042 to .053. The unidimensional nature of the scale obviated further model confirmation via bifactor analysis.

Scaling. The unidimensional factor was calibrated and scored using the graded response model and EAP with adaptive quadratures. Mean slope and threshold were 0.86 and 1.42 respectively. Highest maximum information was 1.1 at $\theta = -.65$, lowest maximum information was 0.29 at $\theta = 2.12$, and composite reliability was .86.

Typal Structure

In stage one, fusion statistics indicated that various cluster solutions might be possible given appropriate elevation of pseudo-*F* statistic with regard to pseudo- r^2 . Mojena’s stopping rule indicated a possible 5 to 10 clusters for all of the seven blocks. Decreases in R^2 were examined using graphs and numeric output with trim levels set to 1, 2, and 3. As discussed, a trim of 1 produced the most ideal stage-one characteristics, resulting in 57 first-stage clusters across 7 random blocks, averaging 8.1 clusters per block.

Stage-two clustering proceeded on a 57 X 57 similarity matrix formed by merging stage-one clusters. Each cluster was uniquely identified by its block of origin and submitted to Ward’s minimum variance procedure such that replication rates of final clusters could be calculated (e.g., a 100% replication rate occurs when a final cluster contains one or more clusters from each of the stage-one blocks). After assessing several

solutions, 9 clusters were found to best meet the stated criteria. Within-type homogeneity (i.e., tightness of fit) ranged from .66 to .74 ($\bar{H} = .71$) and separation between clusters (i.e., distinctiveness) ranged from -.097 to .248 ($\bar{r}_p = .13$). Perfect replication rates occurred in two clusters, three clusters had rates of 86% and three more had rates of 71%. Only cluster 4 had a relatively low replication of 57%, but this was still above the nominal 50% required. Stage-three iteration allowed relocation of individual profiles to the cluster of best fit, thereby correcting prospective misclassifications during stages one and two.

Table 10 displays prevalence rates for the 9 types based on the original sample of 1,405 musicians. Replication rates are provided for each type as well as average coefficients for within-type homogeneity and between-type similarity. Given that 19 musicians were trimmed during stage-one clustering, the prevalence rates sum to less than 100%. Table 10 also provides typal descriptions, and a symbolic naming convention provides a shorthand notation that facilitates visualizing each type. Table 11 provides raw mean scores and *T*-scores for each type, this based on the clustered sample of 1,386.

Often, a typology is ordered by average profile levels, often with respect to some valued characteristic or pathology of interest occurring in individuals. The personality domain contains some dimensions however that may not be unconditionally categorizable on the basis of value or desirability (i.e., Extroversion, Openness to Experience). Because of this, and because the Neuroticism dimension was found to produce the most significant correlations with external validator variables measuring musician stress and psychosomatic troubles, the musician types were ordered from 1 to 9 by increasing level of the Neuroticism dimension. Neuroticism also explained the most variance in canonical

Table 10

Prevalence, Homogeneity, Similarity and Replication Rates for Typology of Musicians

Type	% Prevalence	Within-type homogeneity (H) ^a	Between-type similarity (r_p) ^b	% Replicability across 7 independent blocks ^c	Descriptive name and symbol
1	13.81	.72	.003	100.0	Very high O, high E, C, A; low N (+OECA_N)
2	11.32	.71	.098	71.4	High C and E; low N (CE_N)
3	9.04	.72	.165	85.7	High O, A, E; low C and N (OAE_CN)
4	11.89	.72	.230	57.1	High O, E; low A (OE_A)
5	11.89	.74	.248	85.7	Low E (_E)
6	9.96	.73	.217	71.4	High O, C, A, N (OCAN_)
7	10.46	.66	.102	71.4	High O, N, C, low A (ONC_A)
8	11.17	.70	.179	85.7	Very high O, high N; low C (+ON_C)
9	9.11	.66	-.097	100.0	Very high N, high O; Very low C, low A, E (+NO_-CAE)
Average		$\bar{H} = .71^d$	$\bar{r}_p = .13^e$		

Note. $N = 1,405$, as based upon the full sample prior to trim during clustering. The letters N, E, O, A, and C stand respectively for the five dimensions of personality on the NEO-FFI; Neuroticism, Extraversion, Openness to Experience, Agreeableness, and

Table 10 (continued)

Conscientiousness.

^aWithin-type homogeneity indicates the degree of profile similarity among musicians comprising each type such that H values of 1.0 would indicate that all musicians within a type have identical profiles. H decrease with within-type increases in variability. An H of 0.0 would indicate within-type variability equal to the entire sample.

^bBetween-type similarity reveals the degree of similarity between a type and all other types wherein 1.0 would signal an identical mean attribute profile with another type. Decreases in r_p signal decreases in similarity between a type and all others.

^cReplicability of final types indicates the percentage of final stage clusters present in first stage clusters.

^d \bar{H} is the mean of within-type homogeneity values and serves as an overall indicator of musician profile homogeneity.

^eSimilarly, \bar{r}^p is the mean of between-type similarity and indicates overall similarity or dissimilarity between the average profiles of the final types.

Table 11

Mean NEO-FFI Raw and T Scores Comprising Profile Attributes for Typology of Musicians Plus Total Means

Type	Profile Attributes									
	Neuroticism		Extroversion		Openness		Agreeableness		Conscientiousness	
	<i>M</i>	<i>T</i>	<i>M</i>	<i>T</i>	<i>M</i>	<i>T</i>	<i>M</i>	<i>T</i>	<i>M</i>	<i>T</i>
+OECA_N	10.9	39	36.5	65	37.5	68	38.4	61	41.9	63
CE_N	12.3	41	32.7	59	27.3	50	35.0	54	40.8	61
OAE_CN	13.9	43	32.1	58	35.9	65	38.3	61	30.1	43
OE_A	16.7	47	33.5	60	36.0	65	29.0	42	33.9	49
_E	17.1	47	24.2	44	30.3	55	32.6	49	33.5	48
OCAN_	23.7	56	28.6	51	35.8	65	37.3	59	40.2	59
ONC_A	26.9	60	25.5	46	33.1	60	26.0	36	38.1	56
+ON_C	28.6	62	27.2	49	36.7	66	34.5	53	29.4	41
+NO_-CAE	31.0	66	23.5	43	33.5	61	25.9	36	24.9	34
All types	19.6	51	29.6	53	34.0	62	33.1	51	35.1	51

Note. *N* = 1,386.

analyses between the NEO-FFI dimensions and external validator dimensions, to be discussed later.

Symbolic names were constructed for each type according to the following rules. The letters N, E, O, A, and C represent the five personality dimensions: Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. The NEO-FFI scoring sheet provides 5 ranges of *T* scores for interpretation of results where scores are rounded to integers: very low (less than 35), low (35 to 44), average (45 to 55), high (56 to 65) and very high (greater than 65). A string containing a single underscore character (e.g., “_”) helps to encode these ranges for a given type such that a letter occurring before the underscore indicates a high mean score for the corresponding dimension, a letter after the underscore indicates a low mean score, and the absence of a letter indicates an average mean score. A plus “+” before a letter modifies it to indicate very high and a minus “-” before a letter modifies it to indicate very low, according to the five ranges described (very low, low, average, high, very high). Prior to an underscore, letters are ordered left to right from highest to lowest mean, and after an underscore letters are ordered left to right from lowest to highest mean. In this way, the most deviant dimensions stand out in order of deviance when viewing the string from left to right, both before and after the underscore. Table 10 provides translations for all nine types and thus serves as an illustration of the naming convention.

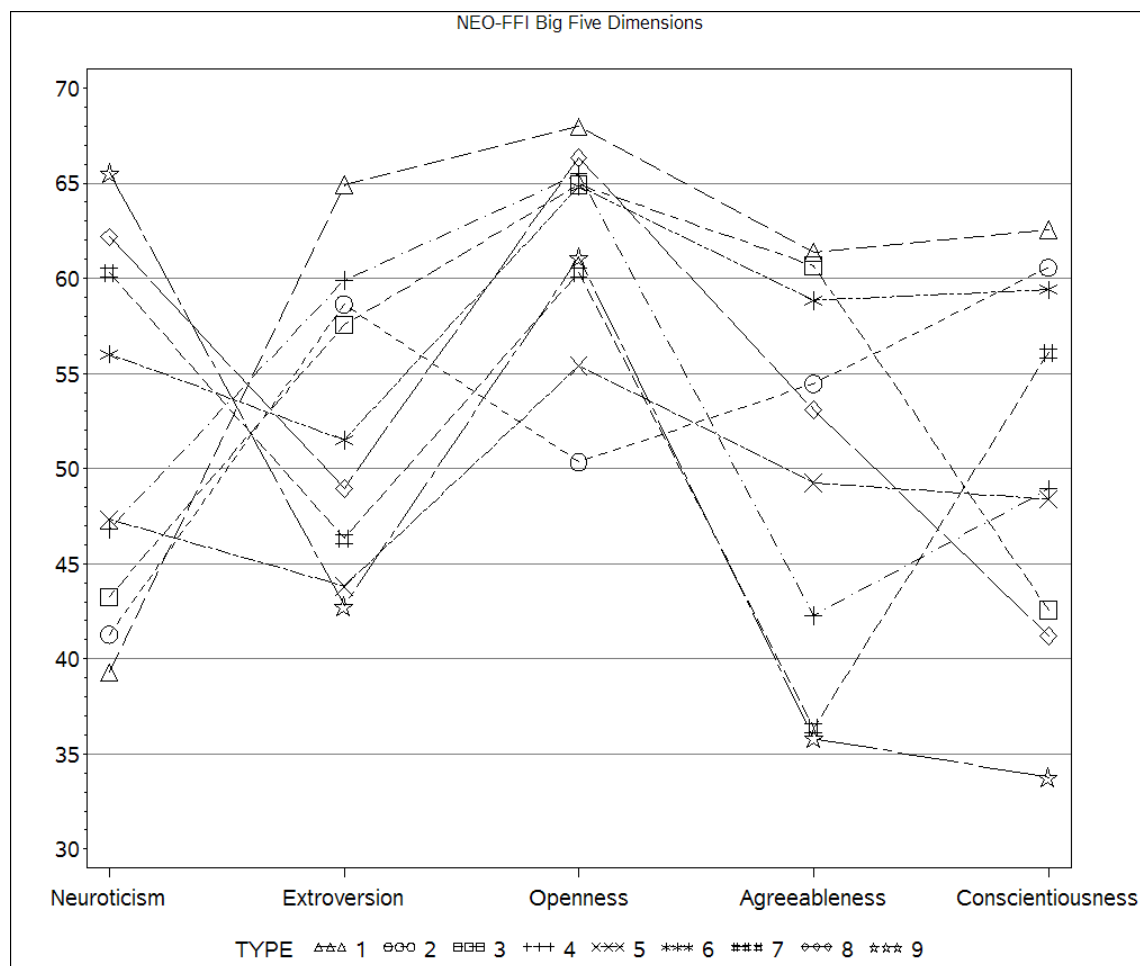
As shown in Table 11, mean *T* scores for Conscientiousness exhibited the largest range from 34 to 63 (30 point spread) followed by Neuroticism ranging from 39 to 66 (28 point spread). Mean scores for Agreeableness ranged from 36 to 61 (26 point spread) followed by Extroversion from 43 to 65 (23 point spread). Openness to Experience

exhibited the smallest range from 50 to 68 (19 point spread). Means across all types with the exception of Openness to Experience were close to the expected average of 50.

Musicians in this sample were significantly more open to experience than population norms for the NEO-FFI with an average T score of 62; more than one standard deviation above the mean. Only two types (CE_N and _E) were average on Openness. Standard deviations on raw scores in this sample ($N=8.92$, $E=6.26$, $O=5.37$, $A=5.81$, $C=6.76$) were similar to those published in the test manual ($N=7.68$, $E=5.85$, $O=5.84$, $A=4.97$, $C=5.88$).

Figure 1 presents the level and shape of the typology as conveyed prototypically by the profile means for the 9 types.

Figure 1. Mean T-Score Profiles for Nine Musician Types



Synopses of Typology

Overview. The following nine types, derived from the post-trim clustered portion of the sample ($N = 1,386$), are described in terms of the NEO-FFI dimensions upon which they were formed (see Table 11). While the symbolic names capture all the profile characteristics of the types in terms of their five dimensions, the synopsis proceeds with names that include the Neuroticism dimension as well as one other NEO-FFI dimension that attempts to capture some unique feature of the type. Neuroticism explained more of the variance in Psychosomatic Troubles and pressures than the other personality dimensions and was therefore used as a primary characteristic in ordering and naming the types.

Each synopsis presents only statistically significant within-type and between-type results, as determined respectively by the standard error of proportional differences and MANOVA with post-hoc univariate analyses (see Table 12). Within-type analyses assume the null hypothesis that each musician type, formed through clustering on personality alone, is proportionally identical to the total sample on multiple characteristics external to the clustering process (i.e., expected proportions of male/female, smoker/nonsmoker, AFM/non-AFM, married/never-married, etc., are assumed to be independent of typal membership), and significant typal deviations from this expectation of congruence with sample norms are reported as prevalence trends (see tables in Appendix F for distributions and prevalence rates).

The typology as described applies to a well-educated, disproportionately male, and racially homogenous sample of musicians, self-selected as volunteer subjects over the Internet. Inferences as to its generalizability should be made with caution.

Table 12

Mean Scores of Nine Types on Statistically Significant External Validator Variables

Variable	Type ^a								
	1	2	3	4	5	6	7	8	9
Identity	46.7	43.3	46.0	50.7	47.0	53.3	55.5	52.6	55.8
Work/Pay	48.9	44.2	47.1	51.0	47.5	52.2	53.4	51.6	54.5
Relationships	49.9	47.0	49.4	52.0	49.3	48.9	51.1	49.5	53.1
Performance	46.7	47.8	49.5	49.6	50.0	52.2	50.3	52.0	53.0
Conditions	49.5	46.8	47.8	50.1	49.3	51.6	51.6	52.0	51.1
Pressure ^b	47.5	43.8	47.0	51.1	47.9	52.3	53.7	52.3	54.9
Troubles	44.1	43.5	47.2	48.5	46.9	52.9	55.3	55.4	58.5

Variable	Tukey post hocs ^c		
Identity	2 < 1, 4, 5, 6, 7, 8, 9; 1, 3, 5 < 4, 6, 7, 8, 9; 4 < 7, 9		
Work/Pay	2 < 1, 4, 5, 6, 7, 8, 9; 3, 5 < 4, 6, 7, 8, 9; 1 < 7, 9; 4 < 9		
Relationships	2 < 4, 7, 9; 5, 6 < 9		
Performance	1 < 5, 6, 7, 8, 9		
Conditions	2 < 6, 7, 8, 9; 3 < 6, 7, 8		
Pressure ^b	2 < 1, 4, 5, 6, 7, 8, 9; 1, 3, 5 < 4, 6, 7, 8, 9; 4 < 9		
Troubles	1, 2 < 3, 4, 5, 6, 7, 8, 9; 3, 4, 5 < 6, 7, 8, 9; 6 < 9		

Note. ^aProfile Types numbered 1 through 9 correspond respectively to the symbols +OECA_N, CE_N, OAE_CN, OE_A, _E, OCAN, ONC_A, +ON_C, +NO_-CAE. The variables Identity, Work/Pay, Business, Performance, and Conditions are short names for factors 1 through 5 respectively from the Musician Sources of Pressure Instrument.

^bPressure is a general pressure factor derived from the sources of pressure instrument.

^cPost hocs only performed when multivariate and step-down univariate tests were significant.

Type 1: Low Neuroticism, very high Openness (+OECA_N). This group of musicians, constituting 14% of the musicians clustered, scored low on Neuroticism, very high on Openness, and high on Extroversion, Conscientiousness, and Agreeableness. They have the most extreme NEO-FFI scores of all nine types, being the lowest on Neuroticism and the highest on all other dimensions. This is the oldest group of musicians ($M = 48$, $Mdn = 50$) with a higher prevalence of musicians of age 45 or older, as well as musicians who have been professionals for 24 or more years ($M = 27.2$, more years as professionals than any other group). This group has higher than expected prevalence rates of females, income range of \$60,000 or more, mothers rated as supportive, fathers rated as supportive, and married musicians versus those never married. The group reported the highest prevalence rates in both the categories of current satisfaction and high enjoyment as musicians. The group is lowest in having a father who is a professional or semi professional musician (7%). The group has the highest percentage of doctoral degrees (36%) and the third highest percentage of master's degrees (33%), trending overall toward more musicians with graduate degrees. Primary musical occupation trends more toward conductors/musical directors than instrumentalists. This group scored lowest in Performance Anxiety and below average in all the other musician pressures as shown in Table 12, consistent with types 2 and 3 that are also low in Neuroticism. On Psychosomatic Troubles this group scored second lowest, significantly lower than seven other types.

Type 2: Low Neuroticism, average Openness (CE_N). This group of musicians, constituting more than 11% of the sample, is low on Neuroticism, high on Extroversion, and high on Conscientiousness, the latter being the highest of its five dimensions. They

are the most atypical group in terms of Openness, displaying a clearly average level ($M = 50$, $Mdn = 50$), lower than all other groups. They are higher-than-expected and highest among all types both in working 35 hours per week or more in nonmusical jobs and in earning \$60,000 or more per year. They trend toward being married rather than never married, to rate their mothers and fathers as supportive, and to be satisfied with their current musical activities (71%). They trend toward having *Other* primary musical occupations versus instrumentalist or teacher/educator. They are less likely than expected to have turned professional at age 18 or younger, to have children, and to have several or more alcoholic drinks per week. They trend toward rating themselves lower as improvisers. They trend toward drums as compared with voice as a primary musical instrument. They are very low on all factors for musician pressures except for Performance anxiety. They are lowest among all nine musician types on Psychosomatic Troubles, significantly lower than seven other types.

Type 3: Low Neuroticism, low Conscientiousness (OAE_CN). This group of musicians, constituting slightly more than 9% of the sample, is low on Neuroticism, high on Extroversion, high on Openness (borderline very high), high on Agreeableness (second highest), but uniquely low on Conscientiousness; a marked departure in profile shape from the other two low-Neuroticism types (types 1 and 2). They are more likely than expected to have children (over 56%) and to indicate both satisfaction with current musical activities (third-highest at 71%) and high enjoyment in musical work (second highest at 51%). They are more likely than expected to indicate the category *Other* as their primary musical style than either classical or jazz. These musicians have more Psychosomatic Troubles than the other two low-Neuroticism types while still scoring lower

than average on all musician sources of pressure factors. They are relatively low on the factors Identity, Work/Pay, and Conditions. They are second lowest on the General Pressures factor, significantly lower than five other types.

Type 4: Average Neuroticism, low Agreeableness (OE_A). This group of musicians, constituting slightly more than 12% of the sample, is average on Neuroticism, high on Extroversion, high on Openness (borderline very high), low on Agreeableness, and average on Conscientiousness. This group has a higher than expected prevalence of males (third-highest at over 76%), musicians earning \$60,000 or more per year (third-highest at 43%), musicians working 35 or more hours weekly at nonmusical jobs (second-highest at over 18%) divorced over married (highest percent of divorced at 19%, and third lowest rate of married at 52%), and musicians having several or more alcoholic drinks per week (highest among all types at over 54%). They had lower than expected AFM membership (lowest among types at 21%), and more than expected electric guitarists as compared with acoustic pianists. Scores on musician sources of pressure factors were overall average. On Musician Identity they are greater than four types and less than two. On Work/Pay they are greater than three types and less than one. On Relationships they are greater than one type. On General Pressures they are greater than four types and less than one. On Psychosomatic Troubles they are greater than two types and less than four, placing them in the moderate range of troubles with a T-score of 49, just below the mean.

Type 5: Average Neuroticism, low Extroversion (_E). This group of musicians, constituting 12% of the sample, is low on Extroversion and average on the other four dimensions. They have a higher than expected prevalence of males (78%), AFM

members (37%), and musicians age 45 and older (63%, the second oldest group). They are lower than expected in prevalence of those possessing a music degree/diploma (66%, lowest of all types), those possessing a graduate degree (53%), classical musicians (49%), and in musicians finding high enjoyment in their work (32%). Prevalence rates for bass guitarists and electric guitarists are each higher than expected when compared with vocalists. There is a disproportionate trend toward musicians with primary occupation of engineer (7%) versus teacher/educator (29%). This group is average or slightly below average on all of the musician sources of pressure, including general pressure. The factors Identity, Work/Pay, Performance, and General Pressures are relatively higher than the respective lowest type for each, indicating overall pressures that are moderate rather than severe. On Psychosomatic Troubles they are greater than lowest two types and less than four types, placing them relatively low in overall severity of troubles.

Type 6: High Neuroticism, high Openness (OCAN_). This group of musicians, constituting 10% of the sample, is high on Neuroticism, average on Extroversion, high on Openness (borderline very high), high on Agreeableness, and high on Conscientiousness. The proportion of females (more than 56%) in this group is much higher than expected given the percentage in the total sample (34%), making this the only type with more females than males. They also depart significantly from the total sample in being the least likely to have children (32%) when compared with the overall rate of parenthood (46%). They are much more likely than expected and most likely among the nine types both to possess a graduate degree (75%, compared with the sample norm of 61%), and to possess a music degree/diploma (86%, compared with the sample norm of 73%), making them the most likely to possess formal education in music of all the types. They are less likely

than expected to have turned professional before the age of 18 (31%, second lowest only to the Type 2), and to have worked for 24 or more years as a professional. They are highly overrepresented in the proportion of classical musicians (77%, as compared to the sample norm of 57%), and their ratings of both the importance of improvisation to their musical approach as well as their ability as improvisers are lower than expected. Scores on the musician sources of pressure factors were overall slightly above average with the exception of the factor, Relationships, which was slightly below average. They scored fourth highest in Psychosomatic Troubles, significantly greater than five other types indicating relatively higher but not highest severity of troubles.

Type 7: High Neuroticism, low Agreeableness (ONC_A). This group of musicians, constituting 11% of the sample, is high on Neuroticism, average on Extroversion, high on Openness, low on Agreeableness and high on Conscientiousness. They are the youngest of all the types ($M = 41$, $Mdn = 38$ years), and less likely than expected to be age 45 or older (37% compared to 54% for the total sample), to have ever been married, to have children (37% compared to 46% for the total sample), to have worked 24 or more years as a professional musician, and to earn \$60,000 or more per year. They are more likely than expected to have turned professional at age 18 or younger, and they have the greatest percentage of musicians to have done so among all the types (50% versus 41% for the total sample). They are the only type significantly higher on absolute pitch (22% versus 16% for the total sample) and they rate improvisation as less important to their musical approach. They are less likely than expected to be satisfied with their current musical activities (50% compared to 62% for the total sample) and to find high enjoyment in musical work (33% compared to 46% for

the total sample). They are second highest on the Identity factor, significantly higher than five of the nine types, placing them in the highest range on this source of pressure. They are second highest on Work/Pay as well, relatively higher than four of the nine types, while being relatively average on Performance and Conditions. They are relatively higher than four types on the General Pressure factor. They are relatively higher than five types on Psychosomatic Troubles, with high but not highest severity.

Type 8: High Neuroticism, very high Openness (+ON_C). This group of musicians, constituting 11% of the sample, is high on Neuroticism, average on Extroversion, very high on Openness, average on Agreeableness, and low on Conscientiousness. Prevalence trends for this type are relatively few in number, indicating less deviance from sample norms. They are however much more likely than expected to be female (45% compared to 34% for the total sample), proportionally the second highest type in female musicians. They trend toward never having been married when compared with being currently married (38% compared to 28% for the total sample), and toward having no children (66% compared to 55% for the sample norm). They report low satisfaction with current musical activities (55% compared to 38% for the sample). They are generally above average on musician pressures. For the Identity factor they are significantly higher than four of the nine types. For the Work/Pay factor they are significantly higher than three types, and higher than four types on the General Pressures factor. They report relatively more severe Psychosomatic Troubles than five of the nine types, putting them in the high range of troubles though not the highest.

Type 9: Very high Neuroticism, very low Conscientiousness (+NO_-CAE).

This group of musicians, constituting 9% of the sample, is very high on Neuroticism, low

on Extroversion, high on Openness, low on Agreeableness, and very low on Conscientiousness. Among all nine types, these musicians deviate most often from sample norms on external validator variables with 18 significant prevalence trends. They are more likely than expected to be male (79%, the highest percentage of males in any type), to have worked at a nonmusical job after completing school (the highest rate of nonmusical work across types), to rate improvisation as important to their musical approach, to rate themselves higher on improvisational ability, to currently smoke cigarettes and to smoke them at a rate of one or more packs per day, to have a primary musical occupation of composer/songwriter (9%) as compared with music teacher/educator (23%) (this as compared to sample norms of 6% and 33% respectively), and to have selected jazz (28%) as their primary musical style compared with classical (39%) , versus sample norms of 15% and 58% respectively. They are less likely than expected to have to children (33%, second lowest children rate across types), to be age 45 or older (second youngest type), to have a graduate degree (only 46%, the lowest type in educational qualifications), to indicate a primary musical style of classical (39%) versus non-classical (61%) (compared to sample norms of 57% and 43% respectively), to be married (45%) as compared with never married (37%) (compared with sample norms of 58% and 28% respectively), and to have income of \$60,000 or more (20% versus a sample norm of 34%). These musicians are much lower than expected on parental support for their musical ambitions, lowest across the nine types for both mothers and fathers. They are also much lower than expected in their satisfaction with current musical activities, at a rate of 42% as compared with 62% for the sample norm, making them the most dissatisfied of any group. They are similarly lower than expected and lowest across

the nine types on finding high enjoyment in their musical work, this at a rate of 21% as compared with 46% for the sample norm. This group of musician scores highest overall on musician pressures and Psychosomatic Troubles, with no other type scoring statistically higher on any of these measures. They report the highest level of Psychosomatic Troubles, scoring significantly higher than types 1 through 6.

Canonical Analyses

NEO-FFI dimensions and musician pressure group factors. Canonical analysis was used to explore relationships between the five NEO-FFI dimensions and five group factors of musician pressure. Since people who tend to report a particular symptom are likely to report other symptoms, this is likely to be the case for pressures since neuroticism is associated both with symptom reporting and less adaptive reactions to stress (Costa & McCrae, 1992; Pennebaker 1982). If an individual's proclivity for reporting pressures is related to personality, knowledge of this relationship is important if pressures are to be used as explicating variables with regard to the typology; one cannot properly define an entity in terms of its own definition, so understanding the overlap between pressures and personality is informative. In other words, to what extent might personality variables assist in explicating reports of pressure; a chicken and the egg question, really, and one which speaks to the transactional concept of the stress process as described earlier, in which the temperament of the individual musician mediates the perception and appraisal of environmental demands as potential sources of stress.

Canonical analysis between NEO-FFI dimensions and group pressure factors produced significant results, with Wilks's $\Lambda = .67$ signaling overall significance, multivariate $F(25, 5113) = 23.06, p < .0001$. Standardized canonical redundancy

coefficients (multiplied by 100 to produce percentages) indicate that 9% of the NEO-FFI variance was explained by group factors, while 12% of the group factor variance was explained by the NEO-FFI. Of the five variate pairs produced, four accounted for significant variation in the model (ranging from $p < .0001$ for the first, to $p < .0111$ for the fourth) with canonical correlations (R_c) ordered first through fourth of .54, .19, .09, and .08. Canonical loadings for the four significant variate pairs are shown in Table 13.

While the canonical correlations and redundancy coefficients therefrom in part derived are not impressively high, the high variate loadings produced by Neuroticism (.94) and Identity (.97) on the first variate pair are noteworthy. The first pair of variates signifies the strongest relationships among the two variable sets, extracting the most variance from the correlation matrices, subsequent variate pairs extracting lesser amounts obliquely from the residuals (see Tabachnick & Fidel, 2001, p. 184). Neuroticism and the Musician Identity factors are clearly prominent in the relationship between the two set of variables. While the shared variance between this variate pair is only 29%, Neuroticism and Identity contribute more to it than any other pair of variables. Alone, Neuroticism and Identity have a Pearson product moment correlation $r = .49$, similar to the .54 canonical correlation for the first variate a pair.

It is interesting to note that all five of the musician pressures produced positive loadings on their variate of the first pair. Notably, Work/Pay had an appreciable loading of .72. Neuroticism was the only appreciable loading from the other set, underscoring the primacy of Neuroticism among personality dimensions in explaining musician sources of pressure.

Table 13

Canonical Relationships for Five Neo-FFI Dimensions with Key External Explicating Variables

Canonical set and variable components for NEO-FFI with pressure factors	Variate pairs				Canonical set and variable components for NEO-FFI with General Pressures and Psychosomatic Troubles	Variate pairs	
	I	II	III	IV		I	II
NEO-FFI					NEO-FFI		
Neuroticism	<i>.94</i>	<i>.24</i>	<i>.25</i>	<i>-.01</i>	Neuroticism	<i>.99</i>	<i>-.12</i>
Extroversion	<i>-.34</i>	<i>-.51</i>	<i>-.06</i>	<i>.64</i>	Extroversion	<i>-.35</i>	<i>.38</i>
Openness	<i>.29</i>	<i>-.28</i>	<i>-.47</i>	<i>.53</i>	Openness	<i>.15</i>	<i>.52</i>
Agreeableness	<i>-.48</i>	<i>.58</i>	<i>-.23</i>	<i>.62</i>	Agreeableness	<i>-.41</i>	<i>-.48</i>
Conscientiousness	<i>-.22</i>	<i>-.02</i>	<i>-.81</i>	<i>-.10</i>	Conscientiousness	<i>-.37</i>	<i>.37</i>
Musician pressures					Musician pressures		
Identity	<i>.97</i>	<i>-.06</i>	<i>.02</i>	<i>-.19</i>	General Pressures	<i>.64</i>	<i>.77</i>
Work/Pay	<i>.72</i>	<i>-.27</i>	<i>.08</i>	<i>.63</i>	Psychosomatic Troubles	<i>.99</i>	<i>-.17</i>
Relationships	<i>.30</i>	<i>-.74</i>	<i>.53</i>	<i>-.03</i>			
Performance	<i>.42</i>	<i>.28</i>	<i>.84</i>	<i>.10</i>			
Conditions	<i>.39</i>	<i>.04</i>	<i>.13</i>	<i>.31</i>			

Note. $N = 1,386$. Standardized structure loadings reveal statistically significant ($p < .0001$) canonical relationships. Loadings $\geq .50$ are considered appreciable and are italicized.

NEO-FFI dimensions with General Pressures and Psychosomatic Troubles. In

a second canonical analysis, the five NEO-FFI dimensions comprised set one variables while the General Musician Pressures factor and the Psychosomatic Troubles factor comprised set two variables. As in the prior analysis, the goal was to determine how personality variables might relate to general pressures and psychosomatic symptoms. The General Musician Pressures factor was not included in the prior analysis because it shares most of the items present in the group factors, and hence would be too highly correlated with them. Thus, to avoid multicollinearity and singularity the group factors and the general factor were placed in separate analyses (Tabachnik & Fidell, 2001, p. 181).

Canonical analysis for the NEO-FFI dimensions juxtaposed with General Pressures and Psychosomatic Troubles produced significant results, with Wilks's $\Lambda = .55$ signaling overall significance, multivariate $F(10, 2758) = 97.13, p < .0001$. Standardized canonical redundancy coefficients (multiplied by 100 to produce percentages, as above) indicate that 13% of the NEO-FFI variance was explained by the two factors, while 31% of the variance for the two factors was explained by the NEO-FFI. As in the former analysis, the NEO-FFI variables explained more of the variance in the opposing set than vice-versa. Both variate pairs were significant ($p < .0001$ for each) with canonical correlations (R_c) of .66 and .15 for the first and second variate pairs respectively. Canonical loadings for the pairs are shown in Table 13. The first canonical correlation is higher than in the prior analysis, indicating 44% shared variance between the pairs. As in the former analysis, one variable from each set, Neuroticism and Psychosomatic Troubles, explains an inordinate amount of variance in the first pair, each with an extremely high canonical loading of .99. Clearly, these two variables explain the majority of the variance in the

first pair; they are, in a sense, complete proxies for their respective variates. Considered alone, these two variables have a Pearson product moment correlation of $r = .65$; nearly identical to the observed canonical correlation between the first variate pair. Again, as in the former analysis, Neuroticism emerges as the primary personality dimension in explaining musician pressures (this time as a general factor), furthermore being the primary dimension explaining Psychosomatic Troubles.

Research Hypotheses

Hypothesis I. As described, the Musician Sources of Pressure Instrument yielded several latent constructs, supporting Hypothesis I. Five dimensions of musician pressure were found in contrast to the 11 by Wills and Cooper (1988). Of note, Performance Anxiety emerged in both studies with the identical set of 7 items. A dimension that Wills and Cooper named Performance Related Anxiety with 5 items emerged in this study as a larger and more general factor of 11 items, Musician Identity, containing 4 out of 5 of the items from the former study, as well as all 3 items from their factor named Effects on Social and Family Life. The current dimension Travel and Poor Physical Work Conditions absorbed most of the items from two dimensions of the earlier study (Work Over/Underload Related to Traveling and Poor Physical Work Conditions).

Hypothesis II. Whereas the Gurin instrument (Gurin et al., 1960) produced four dimensions, exploratory factor analysis on this sample of musicians yielded a unidimensional scale such that Hypothesis II was not supported. The factor structure met all criteria, producing a parsimonious and reliable solution with amply salient loadings on all items. The unidimensional result also comports well with other existing research on symptom checklists (see Pennbaker, 1982).

Hypothesis III. In examining the above typology, types 6, 7, 8, and 9 contain significantly greater proportions of musicians reporting higher levels of occupational stress, higher levels of psychosomatic symptoms, higher rates of cigarette smoking, and correspondingly lower work satisfaction (types 7, 8, and 9). Types 6, 7, 8, and 9 are also the four types in the high and very high (Type 9) range of Neuroticism, supporting Hypothesis III.

Hypothesis IV. Each canonical analysis has revealed a special relationship involving the NEO-FFI dimension of Neuroticism. No other dimension of personality loaded appreciably in either analysis on the first pair. In the first analysis, Neuroticism loaded highly on the first variate, loading positively, albeit less so, on the second and third variates. Stated simply, Neuroticism loads positively and consistently in its relationship with the group factors for musician pressures, and is the primary personality dimension in explaining them.

In the second analysis Neuroticism loaded very highly on the first pair and was the only appreciable loading. Neuroticism did not load appreciably or positively on the second pair, but that pair had a low canonical correlation of .15, accounting for only 2% of shared variance between the pairs. Although Psychosomatic Troubles had the higher loading on the first pair, the General Musician Pressures factor also loaded appreciably. Again in this second analysis, Neuroticism emerges as the primary personality dimension in explaining pressures and troubles.

As noted earlier, musician types highest on Neuroticism, (types 6, 7, 8, and 9) are also significantly higher on troubles and pressures. Therefore, both typal and canonical analyses have clearly shown that higher levels of Neuroticism are associated with higher

levels of stress and Psychosomatic Troubles (i.e., poorer health), and that Neuroticism is the only personality dimension to consistently display this association. These results support Hypothesis IV.

Chapter 5

Discussion

Overview

The Musicians Study has collected a large amount of data. The original goal was to collect 1,000 responses. This goal was exceeded as 1,405 participants each responded to 218 items over the Internet. When the researcher created the first test versions of his survey, he consulted with a long-time friend who runs her own public relations firm, consulting for Fortune 500 clients; someone who has done extensive survey research. When the researcher described the survey to her in hopes of obtaining strategic advice he was told that he would never obtain the needed sample. Thirty minutes (or more) of answering questions online, especially personality items that might require serious contemplation, reflection, and introspection, was too much to expect of any individual. Apparently, she did not understand musicians.

Now, several years later, the data are collected and the results have been tallied. Along the way, many musicians have not only answered the required questions but have gone on to speak about themselves and their lives in the open-ended comments section. But what do all these data and comments say about these musicians in particular and musicians in general? From the comments alone, it would seem that many of them want to be heard, not only through the expressivity of musical creation, but the through words that relate their own experiences.

Musicians and the Big Five Dimensions of Personality

This study set out to classify musicians into types based upon five dimensions of personality. But what are the nature of those dimensions, and what do musicians' scores

of tell us about musicians?

Neuroticism (N). According to the definitions provided in the Professional Manual for the NEO-FFI and the NEO PI-R (the longer version of the instrument), Neuroticism is the most pervasive domain among personality scales, depicted by, “the general tendency to experience negative affects such as fear, sadness, embarrassment, anger, guilt, and disgust” (Costa & McCrae, 1992, p. 14). It is also associated with irrational ideas, impulsivity, and the tendency to cope less effectively with stress. Costa and McCrae assert that those high on Neuroticism may be at risk for some type of psychopathology, although scoring high on Neuroticism does not equate with having a psychiatric disorder. Conversely, having a psychiatric disorder does not necessarily follow from being high on Neuroticism. On the other end of the spectrum emotional stability is associated with low levels of Neuroticism, typifying individuals who are, “calm, even-tempered, and relaxed” (p. 15). People low in Neuroticism thus face stressful situations with equanimity, calling to mind the image of those who exhibit grace or poise under fire.

As shown in Figure 1, musicians in this study varied greatly on Neuroticism by type. On the whole however, these musicians were average when compared with population norms ($M = 50.7$, $Mdn = 49.9$, $SD = 11.5$). This finding is notable given earlier findings. As mentioned, Cooper and Wills (1989) found high levels of neuroticism among popular musicians, as did Kemp with classical musicians (1981a). This finding of average Neuroticism is important because this is the first study among many that set out to classify disparate musicians using a personality instrument with excellent psychometric properties; a measure of personality with roots in lexical analysis, across cultures, of ubiquitous and prominent phenotypic human traits (see Saucier & Goldberg,

1996), and refined by way of psychometric techniques (McCrae & Costa, 1996). McCrae and Costa describe the emergence of the five-factor model of personality:

The FFM did not emerge from inkblot responses or experiments on conditioned reflexes or analysis of life narratives. It is the product of factor analyses of personality descriptions obtained from self-reports and observer ratings. As a theory of personality, the FFM is based on a commitment to rigorous quantitative science and an assumption of human rationality. These features distinguish it in important ways from other theories of personality (p. 58).

Saucier and Goldberg (1996) assert that, “The most important dimensions in aggregated personality judgments are the most invariant and universal dimensions—those that replicate across samples of subjects, targets of description, and variations in analytic procedures, as well as across languages” (p. 35).

What begins to emerge here, through the use of appropriate instrumentation, is a picture of musicians that is in many ways akin to what is observed in the general population; a theme touched upon earlier as per observations by Woody II (1999), and one that will be revisited here. Just as there are all sorts of people in every walk of life, so in terms of Neuroticism there is a diversity of types among musicians. The range of Neuroticism *T* scores in this study was very large, from 25.2 to 85.1, spanning the breadth of interpretable values in the NEO-FFI scoring booklet. As expected, the standard deviations within the clusters, agglomeratively accreted though ultimately divisive, are smaller, ranging from 6.3 to 8.1, reflecting their homogeneity and concomitant decrease in error variance.

Patterns follow from comparing Neuroticism across types. Types 1, 2, and 3, all low in Neuroticism, report high satisfaction with present musical activities, and types 1 and 3 are higher on enjoyment. Types 1 and 2 trend toward high parental support (both mother and father) and higher incomes. Type 1 musicians tended not to have fathers who

are professional or semi-professional musicians. Perhaps for some people, finding their own way into a musical career is a good thing in the presence of a supportive parent or parents who are not musicians.

On the other end of the Neuroticism spectrum, types 7, 8, and 9 trended toward lower present satisfaction. Table A16 in Appendix F shows a symmetric relationship in terms of satisfaction; types 1, 2, and 3 are high while 7, 8, and 9 are low. Income also appears to roughly follow Neuroticism levels, as shown in Table A19 of Appendix F. Types 1, 2, and 4 trend higher on income while types 6, 7, and 9 trend lower. Higher enjoyment in musical work follows the same pattern in terms of Neuroticism as shown in Table A17 of Appendix F; types 1 and 3 trend toward high enjoyment, while types 5, 7, and 9 trend toward lower enjoyment. Smoking follows the pattern in a single-ended fashion, with Type 9 highest on Neuroticism being the only type trending toward smoking, as shown in Table A11 of Appendix F. Table A7 reveals a similar symmetry inasmuch as types 1 and 2 trend toward being married while types 8 and 9 trend toward never having been married. And Table A2 clearly shows that having children follows the same general pattern; types 2 and 3 trend toward having children, while types 6, 7, 8, and 9 trend toward having none.

There appears to be a relationship between age and typal membership. An almost monotonic decrease in age occurs as Neuroticism increases. Mean ages for types 1 through 9 respectively are 48.1, 46.6, 46.0, 46.0, 46.4, 43.0, 40.6, 42.8, and 41.6, with only types 5 and 7 out of order. Steptoe and Fidler (1987) observed a similar inverse relationship between performance anxiety and age, suggesting that higher-anxiety orchestral musicians might be more likely to give up performing while the low-

Neuroticism musicians carried on; attrition by Neuroticism as a correlate of Performance Anxiety and generalized career stress (Steptoe, 1989). They also speculated that older high-Neuroticism musicians may have been less likely to take their survey. Failing to find a relationship between Neuroticism and age, they dismissed these notions. However, their results might not be easily comparable to results in the present study. Steptoe and Fidler employed the Eysenk Personality Inventory (EPI) to measure Neuroticism and Langendörfer (2008, p. 619) has pointed out that this instrument differs in structure and theoretical approach from the NEO-FFI. It may be possible that older musicians represent a group whose temperament has allowed them to survive and adapt over time as musicians, whereas others may move to other professions. Older musicians may represent those who are satisfied and take enjoyment in their musical lives by virtue of good fit with the demands of musical life. Type 1 musicians fit this description by virtue of having been professional musicians for the most years ($M = 27.2$, $Mdn = 29.0$), significantly more than expected. They are the oldest, most experienced, and most satisfied musicians. In contrast, Type-9 musicians have spent the second lowest number of years as musicians and are highest on Neuroticism ($M = 18.9$, $Mdn = 19.0$).

Extroversion (E). Extroverts are characterized as those who are sociable, prefer large groups and gatherings, and are assertive, active, and talkative. They seek stimulation, are likely to be cheerful, and “upbeat, energetic, and optimistic” (Costa & McCrae, 1992, p. 15). Introversion represents the absence of Extroversion. Introverts are independent, prefer to be alone, and are less inclined to outward displays of emotion, though they need not be unhappy, shy, or pessimistic.

As in the case of Neuroticism, musicians in this study varied a great deal on Extroversion. In contrast to the musicians studied by Kemp (1981a, 1981b), musicians in this study were slightly higher than average on Extroversion ($M = 53.2$, $Mdn = 53.9$). Not surprisingly, Extroversion loaded negatively albeit not appreciably on all the canonical variates for which Neuroticism loaded positively and vice-versa, as shown in Table 13. A somewhat similar pattern can be seen across types by examining Extroversion. The types low in Neuroticism tend to be high in Extroversion and the types high in Neuroticism tend to be low in Extroversion. This is particularly true of Type 9 which is highest on Neuroticism and lowest on Extroversion. Viewing Figure 1, it is relatively easy to see that Neuroticism and Extroversion have an inverse relationship via the crossing of lines.

Openness to Experience (O). Regarding Openness, Costa and McCrae (1992) assert that it is lesser known than N or E. Openness is characterized by, “active imagination, aesthetic sensitivity, attentiveness to inner feelings, preference for variety, intellectual curiosity, and independence of judgment” (p. 15). Open individuals are curious, less conventional, more subject to both positive and negative emotional extremes, and intellectually they tend toward the kinds of divergent thinking associated with creativity. Less open individuals tend to be more conservative, and prefer the familiar to the novel.

As a group, the musicians in this study are remarkably high on Openness to Experience ($M = 61.9$, $Mdn = 61.9$, $SD = 9.1$), more than one standard deviation above the population mean. This makes sense given the description of O; one might expect musicians to experience strong emotions, to possess aesthetic sensitivity, and to be attentive to their feelings. Creativity, imagination, and divergent thinking would logically

apply to any artistic domain. As shown in Table 11, only Type 2 is average on Openness, and 21% of Type-2 members work more than 35 or more hours per week at non-musical jobs, disproportionately higher than expected. Type 2 is also the only group to be disproportionately lower on having several alcoholic drinks per week or more (see Table A12), and has disproportionately more drummers than vocalists. How these primary musical instruments choices may relate to O in this sample is unknown.

Openness loads appreciably (.52) on the second variate pair in which personality is juxtaposed with General Pressures and Psychosomatic Troubles (see Table 13). But the canonical correlation for the second pair is quite low (.15), indicating that Openness does not have a strong relationship with Pressures or Troubles. This is readily apparent upon examination of figure 1, since the rank ordering of O bears no apparent relation to the order of N, while Pressures and Troubles are most strongly related to N of all the NEO-FFI dimensions. In other words, O appears independent of N, as revealed by a low correlation, $r = .05$.

Agreeableness (A). Costa and McCrae (1992) note that, like Extroversion, Agreeableness relates to social tendencies. Agreeable people are helpful, altruistic, sympathetic, cooperative, and expect the same treatment from others, whereas disagreeable people are antagonistic, egocentric, skeptical of the intentions of others, and competitive. Being disagreeable and confrontational however can be advantageous when persons need to stand up and fight for their own interests, so neither pole of the continuum is seen as being intrinsically or unconditionally more advantageous. In terms of psychopathological extremes, “low A is associated with narcissistic, antisocial, and

paranoid personality disorders, whereas high A is associated with the dependent personality disorder” (p. 15).

Musicians in this study were overall like the general population on Agreeableness ($M = 50.6$, $Mdn = 50.3$). Type 1, lowest on Neuroticism, was highest on Agreeableness and conversely Type 9, highest on Neuroticism was lowest on Agreeableness. But in between there is no apparent pattern. In both canonical analyses, Agreeableness loaded negatively on the first variate pair where Neuroticism loaded positively, but the loadings were less than appreciable. This indicates an overall inverse association with Neuroticism but not a predominant one, since the nine types do not strictly pattern themselves accordingly. Type 8, high on Neuroticism, is average on Agreeableness. Type 6, high on Neuroticism, is even higher on Agreeableness, so they do not adhere to the inverse relationship. As discussed, Type 6 has more females than males, both in number and in expected proportion; the highest proportion of females in any type (56.4%). Type 6 is also highly educated and has the highest proportion of classical musicians across types (77.1%, see Table A14). The high Neuroticism in this group appears not to be associated with antisocial tendencies, and they are average on Extroversion. Whatever negative affect they may experience is not driving them to externalize their emotional distress in socially antagonistic ways. Of note is the fact that Type 7 is low (borderline very low) on Agreeableness and trends disproportionately toward divorce when compared with those never married. Musicians in Type 9, lowest on Agreeableness, are more likely than expected never to have been married.

The fact that types 1 and 9 reside at opposite ends of both the Neuroticism and Agreeableness spectrums may signify that at the extremes poles Neuroticism, as a

measure of adjustment, spills over coloring the orientation of the musician, exerting a gravitational pull as it were on the other dimensions. Perhaps Neuroticism, as the principal Big Five dimension explaining variance in Pressures and Troubles, is gatekeeper to the other four dimensions, alternately eliding or promoting a host of other adjustment issues, both intrapersonal as well as interpersonal. This will be observed and discussed again below in terms of Conscientiousness.

Conscientiousness (C). Conscientious behavior is rooted in basic impulse control as children learn to manage their desires, but develops into more sophisticated expressions of self-control such as “a more active process of planning, organizing, and carrying out tasks” (Costa and McCrae, 1992, p. 16). This dimension is apparently germane to the population under consideration as Costa and McCrae further signify its meaning:

The conscientious individual is purposeful, strong-willed, and determined, and probably few people become great musicians or athletes without a reasonably high level of this trait. Digman and Takemoto (1981) refer to this domain as *Will to Achieve*. On the positive side high C is associated with academic and occupational achievement; on the negative side it may lead to annoying fastidiousness, compulsive neatness, or workaholic behavior. (p. 16)

Examples of high contentiousness are legion in historical accounts of musicians and musical lore. But the picture may not be so simple to sort out, as the obsessive and conscientious quality of the musician may in some cases be camouflaged by an outward semblance of disorganization and haphazardness often accompanied by substance abuse, as was the case in the life of Jimi Hendrix in 1962, prior to becoming well-known:

Practicing his guitar was the central activity in Jimi’s life that year. He went to bed practicing, he slept with his guitar on his chest, and the first thing he did upon rising was to start practicing again. In an effort to find even more time to practice, he occasionally bought cheap amphetamines so he could stay up all night. This was Jimi’s first regular use of illegal drugs; the amphetamine he was using was

inexpensive and not much more powerful than No-Doz. Other than amphetamines, the only illicit drug he used was marijuana, also common among musicians in the era, but his poverty limited his access even to this. Jimi's obsession with his guitar garnered him a nickname around Clarksville: Marbles. He was so named because people thought he had "lost his marbles" and was crazy as a result of excessive practicing. The guitar had become an extension of his body and Billy Cox observed that Jimi managed to put 25 years into the guitar in a period of just five. (Cross, 2005, p. 98)

This example of single-minded determination cum-Conscientiousness from Hendrix's life is but one of multitudes from the music business, and more specifically from the world of the artist. Jimi was known to miss tour busses and was constantly getting fined and fired from gigs because of lateness, absence, or various forms of insubordination in which he might upstage performers he was working for, such a Little Richard, by way of his flamboyant clothing and stage moves. But when it came to the guitar and making music, Jimi was relentless in the pursuit of his own *will to achieve*, as this passage describing an early encounter with legendary blues guitarist, Albert King, depicts:

... there was a strong sense of machismo among blues players and few were willing to ask such questions or show their inexperience. Surprisingly, many of these established players felt so unthreatened by Jimi that they gladly shared their trade secrets, convinced that this skinny unkempt boy would never develop enough to challenge them. Jimi, however, had both a deep streak of ambition and an inner belief in his own destiny. He became a musical cannibal, quickly assimilating different styles of playing and mastering techniques far quicker than his mentor's thought possible (Cross, 2005, p. 101)

Perhaps the single-minded Conscientiousness of the musician may not be readily apparent outside the musical realm. The following is an e-mail reply received by the researcher after asking a well-known jazz guitarist if he would forward an e-mail invitation for The Musician Study to his musician friends and colleagues. The famous

musician had previously refused to forward the invitation despite the researcher's attempts to explain the potential benefits of the study:

Dear Emmanuel: ... As they say, "You're preachin' to the choir!" Musicians, as you know, are just people, normal, ordinary, and often very, very average people - not particularly deep thinkers. And so, to hope that these same musicians are going to sit down and bother with a survey, any survey is rather absurd. It's not going to happen. And, I'm sorry that the MySpace idea didn't pan out or isn't panning out - but that probably just bears out what I said before. Musicians are lazy, outside the hard work they put in on their instrument - doing extra stuff which nets them nothing will never be high on their list of priorities. All I can do is wish you good luck with this. My situation, no matter what it might appear to be, is not all that much better than some of the musicians whom you have described!!! All the best, (*signature kept anonymous*)

As with Neuroticism, Extroversion, and Agreeableness, the musicians in this study are typical of population norms on Conscientiousness ($M = 51.1$, $Mdn = 50.7$, $SD = 11.4$). Interestingly, as is the case with Agreeableness and Extroversion, extreme types 1 and 9 on Neuroticism also form inverse polar opposites on Conscientiousness. Types 2 and 8, second lowest on Neuroticism and second highest on Neuroticism respectively also comport with this pattern, being second highest and second lowest on Conscientiousness respectively, as shown in figure 1. But the in-between types on Neuroticism, types 3, 4, 5, 6, and 7, follow no particular pattern. Again, it is striking how extremes in Neuroticism comport with extremes in Conscientiousness, illuminative with regard to the earlier assertion that Neuroticism is the most pervasive of all domains on personality scales (Costa & McCrae, 1992), evincing a gravitation-like pull or gatekeeper function with regard to the other dimensions of personality. At its extremes, Neuroticism is likely the strongest indicator of psychopathology versus healthy functioning, seemingly capable of exerting an influence on the individual, in this case the musician, which bleeds through onto the other personality domains.

The loadings in Table 13 indicate that Conscientiousness varies directionally with Extroversion and Agreeableness on both of the first variate pairs extracted (for group pressure factors as well as General Pressures with Troubles), all three of these dimensions correlating negatively with Neuroticism. Examining types 1 and 9 in Figure 1, the polar extremes on Neuroticism line up in perfect opposition with the extremes on Extroversion, Agreeableness, and Conscientiousness; with the exception of Openness the dimensions of personality for this sample of musicians correlate negatively with Neuroticism.

It is interesting to note the characteristics of Type 6 in light of its high Conscientiousness. As discussed, this type trends disproportionately toward being female and highly educated (34% with doctorate, 41% with masters). Across all types, they are most likely to hold a masters degree or higher. They are also more likely than expected to possess a music degree, to be classical musicians, and to be low on musical improvisation in both ratings of importance and ability. They also trend toward turning professional after the age of 18. Perhaps this group's Conscientiousness is related in part to its high level of education and the delay of gratification associated therewith.

Musicians and Occupational Stress: Sources of Pressure

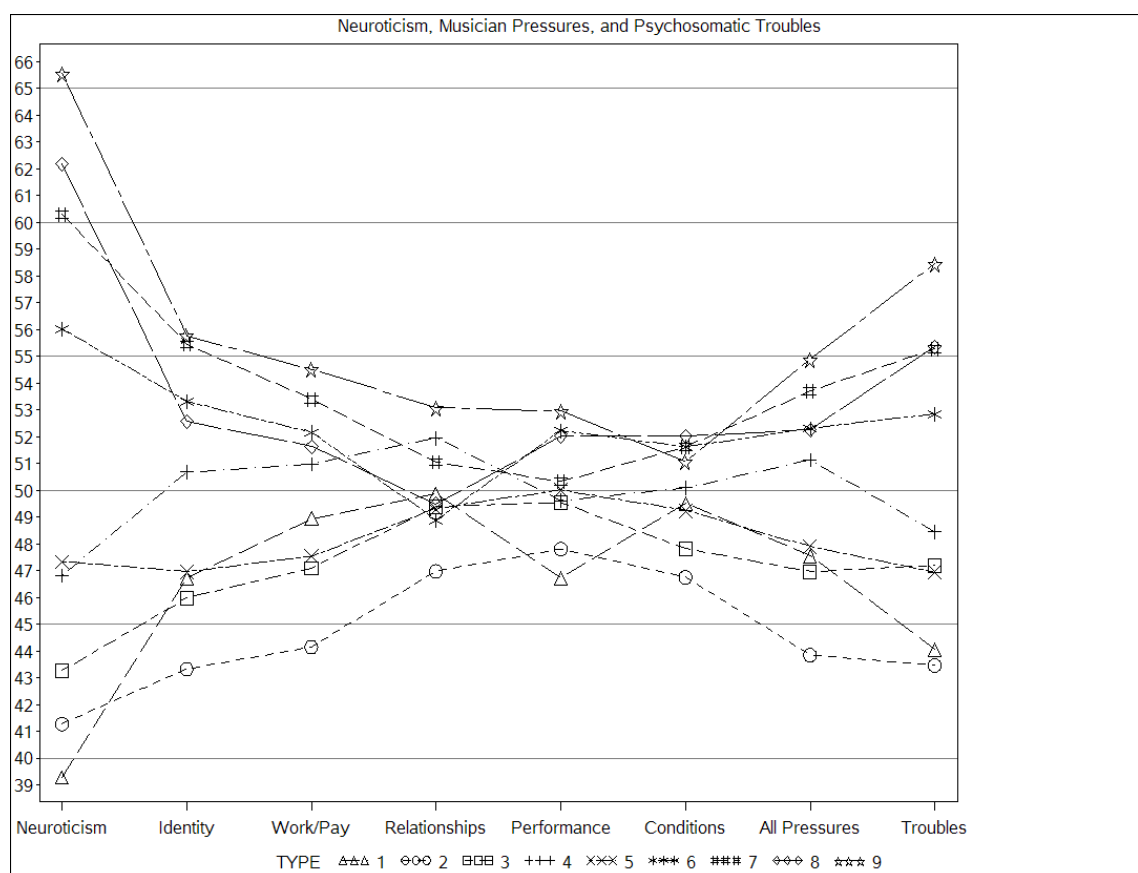
Overview. As stated, this study found five reliable group factors representing sources of musician pressures and one General Pressures factor. These pressures varied across types. Each group factor is listed in Table 8. Figure 2 depicts the relationships among Neuroticism, the five group pressure factors, the General Pressures factor, and Psychosomatic Troubles.

Musician Identity. Musician Identity contains items pertaining to the musician's sense of self and feelings about being a musician. Being the first factor extracted, Identity

accounts for more variance in the smoothed polychoric matrix than subsequent factors.

The highest loading item (.67) is “Feeling that your musical ability is not appreciated because of the public's ignorance about music”. This item captures a sentiment that is

Figure 2. Mean T Scores for Neuroticism plotted with Five Group Pressure Factors, the General Pressures Factor, and Psychosomatic Troubles



common among musicians, as expressed in a survey comment provided by a male

classical pianist in his mid twenties (Type 6):

Though I am very happy as a musician in theory (i.e. I love music and can really "get into it"), the realities of life as an entrepreneur and freelancer coupled with society's lack of appreciation or ignorance of classical music and musicians is disappointing (although I wouldn't say I get "stressed" over it). Several times in a

year I will start to consider changing vocation completely, to try to have a "normal" life: own a home, have a family, have a salary, get a pension. I would consider branching out more: getting more education, attending workshops, master classes, auditioning, etc. if I felt that I would gain financial benefit from these endeavors--I realize I would get personal satisfaction if these endeavors were successful--but without more of a guarantee, I prefer to just do the best I can with what I've got.

Note that Type 6 is significantly higher than four other types on Identity, and significantly lower than no other type. The above comment, targeting the public's ignorance of music, exemplifies the kinds of pressures measured by Identity.

Another salient Identity item is "Having to mingle socially with other musicians so that you will keep getting work". A comment from a middle-aged female classical cellist (also Type 6) poignantly articulates this aspect of Identity:

... in my experience in several cities, big and small, getting work as a musician depends almost entirely on being popular (and I mean that in the worst, high school sense) and knowing the "right" people. This means socializing with people you may not respect and hanging out at places you don't like. Also, if you are gay, socializing can be hell if there are born again Christians in the power group. Homophobia needs to be studied, as it relates to success in classical music. I've never seen one study on that, and particularly lesbians are at a big disadvantage which is cruel if you know you play well but don't get the gigs because of these other unspoken prejudices.

Given the composition of the clustered sample, with 57% classical musicians, it is not surprising that this item would load saliently, and that the Identity factor would account for most of the variance in the 53 items. This factor reflects a sense of alienation from the general public, as well as tensions navigating professional waters with other musicians (e.g., "Feeling that if you are too intense or honest about your music, other musicians will regard you with suspicion"). It also reflects musicians' striving for perfection and worries about losing their abilities. Wills and Cooper (1988, p. 74) reported the highest percentage of musicians (51.3%) felt pressure from the item,

“Feeling that you must reach or maintain the standards of musicianship that you set for yourself”; an item with an appreciable loading of .52 on the current scale.

Tukey post hocs in Table 12 reveal significant differences between scores on Identity. It is readily apparent that Identity increases with Neuroticism. Type 2 is lowest on Identity and Type 9 is highest. As the highest loader on the first canonical variate pair, Identity displays the strongest relationship with Neuroticism of all five group factors (see Table 13). It is therefore not surprising that Type 9 is highest on Identity. That Type 2 is significantly lower than every other type on Identity makes sense even though Type 1 is lower on Neuroticism. Type 2 contains a disproportionate number of musicians who work 35 or more hours per week at nonmusical jobs; this is a group that has the least worries about their Identity as musicians because they trend toward doing other things. Type 9 is not only highest on Identity; it is higher on all pressures and troubles factors with the exception of Travel and Work Environment, on which it is lower only to types 7 and 8, but not significantly so. In fact, types 7, 8, and 9 are not significantly lower than any other types, while types 1 through 6 are all lower than some other type. Types 7, 8, and 9 generally stand out as highest on Neuroticism, pressures, and troubles. As stated earlier, they report low satisfaction with their current musical activities.

Work Underload, Benefits, and Pay. Work/Pay contains items pertaining to lack of work, pensions and benefits, timely payment, becoming better known or better paid, having to work when work is available, and having to play disliked music to earn a living. As for Identity, these are not concerns for Type 2 since they tend to have nonmusical jobs, and therefore would have better control over things like pay, benefits,

irregular work demands, and the kinds of music they play. Type 2 scores significantly lower than seven other types, while types 9 scores significantly higher than 5 types.

The following comment from a Type-8 female, classical, French horn player in her thirties addresses concerns about possible lack of work:

The most important two stressors are the fact that in theory my orchestra could fold at any time, and I wouldn't have any control over it. If this happens, my career is essentially over since obtaining another position worth moving for is near impossible (due to spouse's work). The other main stressor is the instability of the extra income (free-lance gigs not related to my main job) - it's extremely difficult to manage finances this way.

A female jazz musician in her fifties (Type 1) commented on the difficulty of getting health insurance, and also on social aspects of life affected by her work:

Another MAJOR stress factor is the difficulty getting (affording) health insurance as a working musician. An interesting social stress factor is not being able to commit in advance to social invitations because of the nature of free-lance work...not stress for us as much as the perception by "normal" folks that we always put parties, weddings, etc. on the bottom of the list as we "wait for work to come in." very interesting survey - thanks! and good luck with the study. Music is a great, noble way of life, and hugely important to the health of the world. I wouldn't change my occupation for anything!

Artistic and Business Relationships. Relationships pertain to interpersonal and “artistic” concerns. The item, “In the recording studio, disagreeing with your producer or engineer”, produced the highest loading (.69). A male, pop, electric guitarist addresses a related concern: “I am a guitarist/singer that covers many styles. I am a multi-format artist. People don't seem to like that as far as recording contracts go; yet consumers have shown with their iPods that they will listen to quite a variety”. Type 2 is lowest on this source of pressure and Type 9 is highest, as is the case for Identity and Work/Pay.

Performance Anxiety. Interestingly, Performance anxiety was the fourth factor extracted in this study, indicating that it is not the primary source of stress experienced by

musicians in this sample. Yet, this is a well-known stressor for musicians and has received much attention, as discussed. Type 1 is lowest and Type 9 is highest. Examining Table 12, there are no significant differences between types 5 through 9, all of which are significantly greater than Type 1. Performance anxiety follows the general trend seen so far; average scores generally increase with the higher numbered types, as per increases in Neuroticism. A female classical musician (Type 6) in her twenties wrote:

Beta Blockers are used by many musicians as a way to keep calm in a performance. I take a beta blocker for a heart condition and I have noticed a significant decrease in my stress level while performing. Had I taken this survey before I began taking beta blockers my answers would have been very different. I hope this helps and I look forward to seeing the results of your survey.

A female bassoonist (Type 8) in her fifties wrote, “Performance anxiety is a continuing problem for me. Thanks for doing this survey!”.

Travel and Work Environment. Type 2 is significantly lower than types 6, 7, 8, and 9, and Type 3 is significantly lower than 6, 7, and 8. It is not surprising that Type 2 is lowest, as in the case of Identity, Work/Pay, and Relationships. Given the trend toward nonmusical work in Type 2, these musicians are likely to have regular jobs and so are less affected by the vicissitudes of extensive travel and poor work conditions.

A male, rock, electric guitarist (Type 3) in his early twenties commented on the stress of travel:

There is a great deal of stress dealing with substantial college debt, credit card debt and having to work manual labor every week and traveling 500 miles or more every weekend with little time to relax or exercise properly, eat healthy, etc. I am proud to be a part of this study and hope that it will provide some helpful insight to this mysterious and challenging industry. Thanks for allowing me to participate.

General Musician Pressures. The General Pressures factor is based upon all 53 items in the sources of pressure instrument (see survey in Appendix A). As shown in

Table 13, there is a positive relationship between Neuroticism and General Pressures.

Figure 2 also shows the strong relationship between these two measures, as do the Tukey post hocs in Table 12. Type 2 is lowest while Type 9 is highest, as found for Identity, Work/Pay, and Relationships.

Musicians and Psychosomatic Troubles: Identifying Those Most at Risk

As shown in Table 9 (and on the survey in Appendix A), Psychosomatic Troubles appear as a unidimensional construct consisting of 20 common symptoms. The top two loading items appear to be more psychological than somatic (e.g., mental exhaustion and feeling nervous). More extreme symptoms, such as shortness of breath, heart racing, and upset stomach have relatively lower loadings and are probably less prevalent.

Psychosomatic Troubles follow Neuroticism as do the musician sources of pressure factors. Figure 2 and Table 12 reveal a strong association such that Psychosomatic Troubles generally vary with Neuroticism. This is also reflected in the high canonical loadings as already discussed (see Table 13). Types 1 and 2 are in a low tier, followed by 3, 4, and 5 in a below-average tier, followed by 6, 7, and 8 in an above average tier, followed by Type 9 in a high tier of its own.

According to Pennebaker, “the presentation of physical symptoms and somatic problems occurs in a number of neurotic disorders that are associated with anxiety” (1982, p. 11). Accordingly, hypochondriasis, or high symptom reporting, is seen as a reaction to a disappointing life.

This comports with the general trends that have emerged with this sample of musicians. Higher Neuroticism has been associated with a host of putatively negative characteristics: (a) lower satisfaction with current musical activities, (b) lower levels of

enjoyment from work as a musician, (c) lower income, (d) higher rates of cigarette smoking, (e) reports of less mother support, (f) reports of less father support, (g) taking a non-musical job after school, (h) lower Agreeableness, (i) lower Conscientiousness, (j) higher reports of occupational stress, and (k) higher reporting of psychological and physical symptoms.

Strengths of the study

As stated, this study collected data from a large and diverse sample of musicians. The fact that it was even possible to collect such a sample says something about the feasibility of studying musicians in this manner. Many musicians were interested in expressing themselves, even those low on Extroversion, Agreeableness, and Conscientiousness. Full ranges on all personality dimensions were captured with the exception of Openness to Experience, which was average or above average. There is always the possibility that those who are more open are more likely to participate in a study like this, regardless of whether they are agreeable or neurotic.

Reliable and valid psychometric techniques were used to analyze the data. Musicians of many kinds were measured using common yardsticks; the same instrumentation was applied to all. There was no missing data and no manual coding errors.

The large sample size allowed nine distinct types to emerge, all meeting requirements for homogeneity and distinctiveness. Results confirmed that musicians experience occupational stress from a variety of sources, and that clustering musicians on personality produces some types at higher risk for stress-related illness. Results also confirmed that relationships exist among explicating variables and personality

dimensions such that higher scores on Neuroticism are associated with higher levels of stress and poor health. The study failed to find multiple factors of Psychosomatic Troubles, but this is not surprising given the dynamics of symptom reporting.

Weaknesses of the study

The sample, though large compared with other studies on musicians, was not a representative cross-sample of all North American musicians. The researcher attempted to contact all musicians who might participate, but this was not done in a systematic manner. Minorities were underrepresented, and the sample consisted of many musicians with masters and doctorate degrees. Classical musicians comprised the majority.

On many categorical variables, disproportionalities were undetectable due to cell sizes of less than 10, where the standard error of proportional differences does not produce reliable results. Some variables had to be bifurcated to produce observable and interpretable results. Prior research has found musicians to be high on Openness to Experience, but there is no way to be certain if musicians higher on Openness were more likely to participate. As in all self-report studies, the validity of the data depends on how the participants responded to the items. While the results make sense, there was no lie scale, so there is no knowledge of individuals who might have responded inappropriately.

Future Research

Additional factor analytic work can be done on items representing drug use, coping, frequency of work in various styles, and frequency of work in various roles. These items, presented in groups with common anchors, should not be treated as individual survey items. Rather, they should be treated as related variables whose variance may best summarized and explained through the discovery of latent factors.

This study has produced a rich data set. Numerous other relationships surely exist between many of its variables. The study has examined disproportional prevalence rates of males and females across types, but has not fully explored for gender-based relationships that might exist. Similarly, a host of other categorical variables have been collected and other important relationships might exist, as of yet uncovered. The researcher plans to mine this data set and explore alternate ways to code categorical variables to uncover additional relationships.

As mentioned 29% of the musicians surveyed provided comments. Only a small sample of them has been included here to illustrate aspects of personality and stress. Future analysis of the 405 musician comments, with respect to the typology as well as other variables, may lead to additional findings, both in terms of prevalence of comments across profiles types, and in terms of their content.

There is room for refinement of existing scales measuring musician pressures. Many participants provided valuable feedback as to what might have been asked, and which items were difficult to respond to. Many similar items on the pressures scale were contiguous and may have formed response sets, loading on the same factors due to proximity. A fair number of pressure items did not load saliently on any factor and there were too few items to reliably identify pressures experienced by composers and others whose occupations were not listed. A female classical pianist (Type 7) in her sixties provided the following comment:

This survey, in my opinion, does not represent the views of a classically trained musician working at a teaching profession. It is skewed far too much in the direction of so-called "professional" musicians who, most likely, are really non-educated in the field of music. Where are the questions about types of study - musicology, theory, history? Or publications in the field? In other words, the true

professional musicians, as usual, are obliterated in favor of the "rock stars." I find this study rather insulting to the musician for whom music is truly one's life.

A female oboe player (Type 6) in her fifties wrote, "I am primarily an academic and a composer, so the majority of questions did not apply to me". And a male classical composer in his sixties (Type 9) wrote:

This survey seems primarily concerned with performers who work at regular gigs. Few questions are directed at composers of concert music which is my major interest. "Composer" is not even listed as a primary or secondary interest on the instrument list early in the survey. I'm not certain why I was even contacted to participate in this survey. The survey's presumptions, in my judgment, reflect and reinforce the increasing marginalization of classical concert music in our culture by the popular media. Frankly, your bias as to what constitutes music culture is annoying. Your 'types' or 'categories' of musical styles are in keeping with the way the Grammy Awards Show structures its prizes and this, in turn, reflects the manner in which the music industry markets its products. I suspect that your real topic here is rock musicians and drug usage. Oh well, good luck with your doctorate.

Clearly, the pressures instrument could be revised to better reflect a diverse population of musicians, and similar items could be randomly distributed throughout the scale. The pressures scale was designed as part of a study on popular musicians, and many musicians commented that the sources of pressure were not relevant to them, so they did not know how to respond. A more general scale might be developed to achieve better coverage on a broader array of occupational pressures.

Classical musicians were not alone in feeling that the study did not relate to them. A male, rock, acoustic guitarist in his 40s (Type 9) wrote the following comment, suggesting that various kinds of musicians feel their lives and work are not well understood.

I personally think your survey is out of touch with what most musicians experience. I say this because the opening questions, which establish a musician's employment situation, will not give an accurate representation of how most of the musicians I know who work spend their time. Most play more than two

instruments. Most play any gig in any style. Most take on multiple tasks, such as producing, composing, teaching and performing. I don't think your survey addresses this adequately. I appreciate that someone is trying to understand musicians and how most musicians do not stop thinking music when the job ends, which I think is the primary difference between us and the average worker who can walk away at the end of a work day. Music is not just a job, but a lifestyle, a mindset, and an internal condition. But try and tell that to the 9-5er and watch the puzzled expression.

Finally, a study like this could be extended and/or repeated in an effort to obtain a larger more representative sample. A larger sample would allow a much more fine-grained analysis and would allow for more sensitive comparisons across musical instruments, musical styles, and musical occupations, all combined with relevant demographics. There is no reason why a more detailed mapping of musician characteristics could not be attempted; a typical population mapping of the phenotypic *musical genome*.

More work should be done to understand the underrepresentation of African-Americans and Hispanics. This would allow for greater generalizability of findings. The Musician Study has demonstrated both the feasibility and the utility in creating a typology of musicians, but future efforts should seek a more representative sample.

Implications of the Study

Some years ago, the researcher had the good fortune to take a two semester sequence in the study of species counterpoint and one graduate semester of compositional analysis with the late composer, Nicolas Roussakis, who was teaching at Rutgers University. Roussakis was at the time president of the American Composer's Orchestra, and he was a true Renaissance Man as well as an activist for *New Music*. He brought a rare love of history to the study of species counterpoint, transporting our small class to the mindset of the 16th century through an unusual clarity of speech, compelling as it was

natural, transparently conveying the humanity behind the music. Everything in our study of *punctus contra punctum*, point against point, revolved around the Renaissance ideal of *unitas et diversitas*, unity and diversity. Ideal counterpoint is achieved when each voice stands out as a unique, identifiable, melody, each with its own climax, melded in sonic discourse with other voices.

At the time, the researcher was considering graduate school for music, but speaking with Roussakis helped him to gain clarity that this was not the road for him; not his *Gradus ad Parnassum*. Roussakis helped the researcher to see that there would be few opportunities for him, and referred to higher education in music as an “incestuous” cycle whereby students became teachers.

It appears that many students of music have not had the good fortune to encounter such an honest and scholarly person. A classically trained female vocalist in her twenties (Type 5) provided this comment at the end of the survey:

I think the majority of people that get a degree or degrees in music aren't dealt with honestly in their studies. No one tells you that unless you're willing to commit all of your resources to music and/or get lucky, you will very likely not be able to make a living solely as a musician simply because the supply of musicians outweighs the demand. Yes, I may be happy doing my regular job and teaching on the side, but it certainly wasn't the plan I had laid out for myself in school. Sadly, no one tells you the reality and feasibility of those plans.

A classically trained female flautist in her thirties (Type 6) similarly wrote, “Music degrees hardly prepare students for the cut throat realities of making a living. More career development courses need to be offered to help prepare musicians.”

The Renaissance ideal, *unitas et diversitas*, suggests a balance of elements. In counterpoint there is balance between the unity and individuality of voices. Good counterpoint functions both at the level of the individual voices and as a whole. The

diverse personalities of musicians may best be understood by approaching them as a whole, punctus contra punctum, as a polyphony of types, as shown in Figure 1. We might apply the metaphor of counterpoint to the study of musicians by seeking contexts that balance unity and diversity, looking at large numbers of musicians across types, systematically, as a whole, rather than in small homogenous groups, such that a true diversity of types might emerge. If one wants to know about the temperament and occupational risks associated with being a musician, they might best achieve this goal by studying *all* musicians.

The goal of this study has been to learn about the personalities of disparate kinds of musicians using reliable and valid measurement techniques, to classify them into types based solely on personality, and to observe how typal membership might relate to occupational stresses and strains. Just as there are not separate IQ tests for males and females, so it makes sense to attempt to measure the personalities, stresses, and strains of all musicians using common yardsticks.

Results suggest that musicians are, on average, as diverse as the normal population in many respects, though they differ on Openness to Experience. Results also suggest that musicians high in Neuroticism, much like non-musicians, are likely to experience more stresses and strains. In this sample, the highest levels of Neuroticism were associated with low levels of Extroversion, Agreeableness, and Conscientiousness. Conversely, the lowest levels of Neuroticism were associated with high levels of Extroversion, Agreeableness, and Conscientiousness. Openness to Experience did not follow this pattern.

Unique individuals interested in careers in music could have more opportunity, very early on, to understand where they might be situated in the diverse panoply of musical possibilities and musical personalities. They could be afforded the opportunity to understand the balances and tradeoffs that accompany the musical life. Some people are lucky enough to just know this; they have the vision from an early age to know who they are and to see where they fit in, and to find their musical voice, their path to musical expression. Others do not. Just as intellective ability alone does not qualify everyone equally to be a physician, a lawyer, an engineer, a leader, a teacher, an actuary, or a psychologist, so should musical ability and the love of music be considered in the context of temperament. To quote Nicolas Roussakis, “Everyone loves music because music is so beautiful”.

There is no one musical temperament. While stereotypes develop for reasons (e.g., brass players are typically thought to be more extroverted than string players), the diversity of findings from prior research (see Langendörfer et al., 2006; Woody II, 1999) suggest that there may be few singular mappings among categories of musicians. Similarly, there are no, singular, formulaic, mappings to the riddles behind success, happiness, and fulfillment in the musical arts, just as there are no formulas for life. Instead, there is a multiplicity of musical temperaments, and a multiplicity of personality profiles. The landscape is topographically multidimensional and multivariate in nature. Anthony Kemp has written extensively on this subject:

To talk, however, about the musician’s personality as a homogeneous configuration of traits would be naïve, and certainly those researchers who have undertaken investigations on this basis have been surprised by the variability of their results (1996, p. viii).

It would appear music programs could do more to educate students about the futures that await them. Much of this is probably learned by osmosis, by being around other students and teachers. But research has shown that student expectations about the stresses that await them differ from the stresses cited by professional musicians (Steptoe, 1989). More education in this area might be helpful, as might personality testing for students.

Roussakis often stated about species counterpoint that the reason for learning the rules is to know when you are breaking them. Similarly, the argument could be made that personality testing has a place alongside academic qualifications and auditions, and might round out the picture for students and institutions. If there are musical temperaments, why not know something about them at the beginning of the journey? Allow the tea leaves of psychometric measurement to fall where they may, and then decide to break the rules or go with them.

Such an assertion may not sit well with musicians and artists. According to Kemp, “Thorndike maintained that whatever is seen to exist can, theoretically, be measured” (1996, p. 3). Many artists may feel antagonistic to the idea that their muse is measurable; a notion anathema to those with core beliefs of art as a uniquely soulful, spiritual and divine expression. Such views are not uncommon, as here in a comment from a male, jazz, electric guitarist in his late thirties (Type 1):

The rewards of a life in music may not be monetary, however they are more beneficial to a person. The lifelong pursuit of music gives us an intimate knowledge of the wonder of creation. The musical tones themselves reorder our physical selves and protect us from all manner of evil from within and without. The music is always growing and we are mere servants to it's whims and fancies, how blessed I am to be a part of it.

A larger question thus looms regarding the place of systematic, empirical, research within the arts. Many great creative acts occur under conditions that are spontaneous and less than ideal. Adverse conditions are often seen as the very soil in which new and great ideas germinate. Bring in the measurement scientists and the theories and you destroy the spontaneity, the pandemonium, and the fun.

The researcher makes no firm assertions here, except to say that things change over time, the world changes, and people find ways to create and express themselves regardless. No matter what new rules the background climate of knowledge may create, people find ways to break them. Putting on blinders and veering away from potential knowledge would seem rather to weaken the evolutionary pressures that birth new ideas rather than allowing them to play out. Like grass between pavement cracks, creativity emerges under any set of circumstances.

Appendix A

Dear musician:

Please note that your answers will remain ANONYMOUS AND STRICTLY CONFIDENTIAL.

YOUR E-MAIL ADDRESS HAS ALREADY BEEN DISCARDED.

This survey will take about 30 minutes and needs to be completed in one sitting, although there is no time limit. Once you have understood a question your initial answer is often your best.

Please note that you cannot go back once you have advanced to the next page.

Thank you very much for your participation!

Click "Next" to begin ...

Gender:

- ☐ Female
- ☐ Male

Age:

Please type your age into the
box: _____ years.

Race:

- ☐ White
- ☐ African American / Black
- ☐ Hispanic
- ☐ Asian or Pacific Islander
- ☐ American Indian or Alaskan Native
- ☐ Other

In what state or province in the United States or Canada do you reside?

(Note: select "Other" at the bottom of the list if you reside outside the US and Canada.)

[- Select One -]

Marital status:

- ☐ Never Married
- ☐ Married
- ☐ Separated
- ☐ Divorced
- ☐ Widowed
- ☐ 5 or more

How many children do you have?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5 or more

What is the highest educational qualification you have attained?

- ☐ None
- ☐ High School Diploma
- ☐ Associates Degree
- ☐ Bachelors
- ☐ Masters
- ☐ Doctorate

Do you have a diploma or degree in music?

- ☐ No
- ☐ Yes

Did you work in a non-musical job on leaving school?

- ☐ No
- ☐ Yes

Mother's musical history:

- ☐ Not a musician
- ☐ Amateur, music as pastime
- ☐ Semi-professional, work occasionally or part time
- ☐ Professional musician, primary occupation
- ☐ Don't know

Father's musical history:

- ☐ Not a musician
- ☐ Amateur, music as pastime
- ☐ Semi-professional, work occasionally or part time
- ☐ Professional musician, primary occupation
- ☐ Don't know

Regarding your musical ambitions, your mother has been:

- ☐ Supportive
- ☐ Neutral
- ☐ Unsupportive
- ☐ Don't know

Regarding your musical ambitions, your father has been:

- ☐ Supportive
- ☐ Neutral
- ☐ Unsupportive
- ☐ Don't know

At what age did you become a professional musician?
(enter 0 if never a professional musician) _____

How many years have you worked as a professional musician? (enter 0 if never a professional musician) _____

How many hours per week do you currently work in a non-musical job? (enter 0 if none) _____

Are you currently a member of the American Federation of Musicians? (also known as the AFM or the "Musician's Union")

- ☐ No
- ☐ Yes

What is your annual income (in U.S. dollars)?

- ☐ Under \$10,000
- ☐ \$10,000 to \$19,999
- ☐ \$20,000 to \$29,999
- ☐ \$30,000 to \$39,999
- ☐ \$40,000 to \$49,999
- ☐ \$50,000 to \$59,999
- ☐ \$60,000 to \$69,999
- ☐ \$70,000 to \$79,999
- ☐ \$80,000 to \$89,999
- ☐ \$90,000 to \$99,999
- ☐ \$100,000 or over

Please select your primary and secondary musical instruments (note that "Voice" is listed as an instrument).

If your instrument or a similar one is not listed please select one of the "Other" categories at the bottom of each list.

Primary musical instrument: [- Select One -]

Secondary musical instrument: [- Select One -]

(Note: select "None" at the top of the list if no secondary instrument.)

Please select the styles of music that best reflect the type of musician you are:

Primary musical style: [- Select One -]

Secondary musical style: [- Select One -]

(Note: select "None" at the top of the list if no secondary style.)

How often do you work as a musician in these musical styles? Please select the most appropriate response for each.

	Never	Sometimes	Often
Classical	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jazz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Folk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rock	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soul / Rhythm & Blues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hip Hop / Rap / Rapcore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dance / Electronic / Techno	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Theatre / Broadway	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dance Band / Swing Era	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Religious / Worship / Gospel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reggae / Ska / Dub	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Latin / International	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fusion / Jazz-Funk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
New Age / Ambient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What is your primary musical occupation?

- | | |
|--|---|
| <input type="checkbox"/> Instrumentalist | <input type="checkbox"/> Conductor/Music Director |
| <input type="checkbox"/> Vocalist | <input type="checkbox"/> Producer |
| <input type="checkbox"/> Teacher/Educator | <input type="checkbox"/> Engineer |
| <input type="checkbox"/> Composer/Songwriter | <input type="checkbox"/> Other |
| <input type="checkbox"/> Orchestrator/Arranger | |

What is your secondary musical occupation?

- | | |
|--|---|
| <input type="checkbox"/> Instrumentalist | <input type="checkbox"/> Conductor/Music Director |
| <input type="checkbox"/> Vocalist | <input type="checkbox"/> Producer |
| <input type="checkbox"/> Teacher/Educator | <input type="checkbox"/> Engineer |
| <input type="checkbox"/> Composer/Songwriter | <input type="checkbox"/> Other |
| <input type="checkbox"/> Orchestrator/Arranger | <input type="checkbox"/> No secondary occupation |

How often do you do the following?				
	Never	Sometimes	Often	
Work as a member of an orchestra	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a featured orchestral soloist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a member of a local group or ensemble	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a member of a touring group or ensemble	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a freelance musician playing local gigs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a freelance musician playing gigs on the road	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a resident musician in a nightclub band, ballroom, theatre, on a TV show, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a session musician in recording, radio, or TV studios	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a composer/songwriter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as an orchestrator/arranger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a conductor/musical director	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a music teacher/educator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as a producer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Work as an engineer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Is improvisation important to your musical approach?

- ☐ Not Important
- ☐ Somewhat Important
- ☐ Important
- ☐ Very Important

How would you rate your own ability as an improviser?

- ☐ Little or No Ability
- ☐ Some Ability
- ☐ Good Ability
- ☐ Exceptional Ability

Do you possess absolute pitch (i.e., "perfect pitch": the ability to identify any pitch heard or produce any pitch referred to by name)

- ☐ No
- ☐ Yes
- ☐ Don't know

(Note: below are the instructions for the NEO-FFI)

The following section contains 60 statements. Read each statement carefully. For each statement select the response that best represents your opinion.

Select "Strongly Disagree" if you **strongly disagree** or the statement is definitely false.

Select "Disagree" if you **disagree** or the statement is mostly false.

Select "Neutral" if you are **neutral** on the statement, if you cannot decide, or if the statement is about equally true and false.

Select "Agree" if you **agree** or the statement is mostly true.

Select "Strongly Agree" if you **strongly agree** or the statement is definitely true.

Note: Sixty proprietary NEO-FFI items go here. Twelve items measure each of the Big Five dimensions of personality: Neuroticism (N), Extroversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C). Each item contains a 5-point Likert scale with anchors: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree.

(Note: the following 11 screens comprise the Musician Sources of Pressure Instrument as displayed, five items per screen)

Please select the response that best reflects the degree to which the statement is a source of pressure in your life and work as a musician.				
		No pressure	Moderate pressure	A great deal of pressure
	Playing at a venue with bad Conditions, e.g., poor dressing rooms, poor acoustics, small stage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Working in the enclosed and isolated environment of the recording studio	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Working at night, often into the early hours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Having to compose music on a deadline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Worrying that the music you compose may not be commercially successful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please select the response that best reflects the degree to which the particular statement is a source of pressure in your life and work as a musician.				
		No pressure	Moderate pressure	A great deal of pressure
	Doing a long tour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Doing recording sessions or rehearsals during the day, then having to do a gig at night	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Having to read and play a difficult part at a recording session or gig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Playing where there is inadequate rehearsal or preparation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Having to play after traveling a long distance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please select the response that best reflects the degree to which the particular statement is a source of pressure in your life and work as a musician .				
		No pressure	Moderate pressure	A great deal of pressure
	Having to work when work is available, making it difficult to take vacations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Working alone, composing or arranging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling lonely or bored in strange towns or hotels when on tour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Having to do a routine, repetitive gig such as working in a theatre pit orchestra	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Waiting around for long periods at the gig before it's time to play	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please select the response that best reflects the degree to which the particular statement is a source of pressure in your life and work as a musician .				
		No pressure	Moderate pressure	A great deal of pressure
	Effects of noise when the music is heavily amplified	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Endangering your life by having to drive a long distance after a gig when you're tired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	The expense of instruments and other musical equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Instruments or equipment not working properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Coping with an instrument that is physically difficult to play	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please select the response that best reflects the degree to which the particular statement is a source of pressure in your life and work as a musician .				
		No pressure	Moderate pressure	A great deal of pressure
	Keeping up with new equipment and technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Having to play or work on music you don't like in order to earn a living	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Worrying because of the lack of work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling that you need to become better known and/or better paid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Worrying about being fired from a gig or group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please select the response that best reflects the degree to which the particular statement is a source of pressure in your life and work as a musician .				
		No pressure	Moderate pressure	A great deal of pressure
	Worrying about the lack of pensions and benefits in the music profession	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Waiting for payment to come through from a gig, session, or project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Finding it difficult to get a good recording or management deal for your group or musical project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	If you are a member of a famous group, feeling that this puts special pressures on you	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling that you have reached the top too soon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please select the response that best reflects the degree to which the particular statement is a source of pressure in your life and work as a musician .				
		No pressure	Moderate pressure	A great deal of pressure
	Personality clashes with, or jealousy of other musicians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Coping with criticism in the music press or from other musicians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Having to mingle socially with other musicians so that you will keep getting work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling that if you are too intense or honest about your music, other musicians will regard you with suspicion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Coping with a group leader or someone else in a leadership position whose musical ideas clash with yours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please select the response that best reflects the degree to which the particular statement is a source of pressure in your life and work as a musician .				
		No pressure	Moderate pressure	A great deal of pressure
	Having to fire a musician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	In the recording studio, disagreeing with your producer or engineer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Hiring musicians on short notice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Worrying about all the musicians getting to the gig on time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling that playing is only one part of being a musician, e.g., also having to drive the group's transport, set up equipment, repair faulty amps, hustle for gigs, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please select the response that best reflects the degree to which the particular statement is a source of pressure in your life and work as a musician .				
		No pressure	Moderate pressure	A great deal of pressure
	As an artist, coming into conflict with recording, management or agency executives who are involved in your career and who do not share your musical ideals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling that decisions about your group's musical policy are made without consulting you	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling alienated from people who lead a "normal, everyday" lifestyle and who may regard you as a "second-class citizen"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Stress put upon personal relationships, e.g., marriage, due to unusual working hours and long periods away from home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling "high" after a gig and having to unwind, often with the use of alcohol or drugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please select the response that best reflects the degree to which the particular statement is a source of pressure in your life and work as a musician .				
		No pressure	Moderate pressure	A great deal of pressure
	Feeling tense or nervous when playing a live gig with your regular group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling tense or nervous when playing a live gig as a session musician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling tense or nervous when playing in the recording studio with your regular group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling tense or nervous when playing in the recording studio as a session musician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Doing an audition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please select the response that best reflects the degree to which the particular statement is a source of pressure in your life and work as a musician .				
		No pressure	Moderate pressure	A great deal of pressure
	Feeling that you must reach or maintain the standards of musicianship that you set for yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Worrying that your ability to play will leave you	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling that your musical ability is not appreciated because of the public's ignorance about music	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Worrying that your style of music is no longer fashionable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Worrying about the prospect of flying when you have a tour or gig in a foreign country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note: the following 4 screens comprise the Sources of Trouble Instrument as displayed, five items per screen)

Please indicate how often you have experienced the following troubles during the past THREE MONTHS .				
		Never	Sometimes	Often
	Trouble getting to sleep or staying asleep	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling nervous, fidgety, or tense	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Headaches or pains in the head	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Lack of appetite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Getting tired very easily	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate how often you have experienced the following troubles during the past THREE MONTHS .				
		Never	Sometimes	Often
	Upset stomach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Difficulty waking up when you have to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ill health affecting the amount of work you do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Shortness of breath when not exercising or working hard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Feeling "let down" by unexpected events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate how often you have experienced the following troubles during the past THREE MONTHS .				
		Never	Sometimes	Often
	Crying easily	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Heart racing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Smoking, drinking, or eating to excess	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Spells of dizziness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Nightmares	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate how often you have experienced the following troubles during the past THREE MONTHS .				
		Never	Sometimes	Often
	Trembling muscles (e.g., hands tremble, eyes twitch)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Mental exhaustion, difficulty concentrating or thinking clearly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Sweaty hands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Being unable to take care of things because you couldn't "get going"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Wanting to be left alone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Note: Ten Coping item)

How often do you use the following methods to relax?				
		Never	Sometimes	Often
	Take prescribed medications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Use "recreational" drugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Drink coffee, soda, or eat frequently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Smoke cigarettes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Have an alcoholic drink	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Use relaxation techniques	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Talk to someone you know	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Leave your work area and go somewhere (time out, sick days, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Use humor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Over the past year, which of the following best describes your typical drinking habits?

- ☐ Abstain from alcohol
- ☐ An occasional drink
- ☐ Several drinks a week, but not every day
- ☐ Regularly, 1 or 2 drinks a day
- ☐ Regularly, 3 to 6 drinks a day
- ☐ Regularly, more than 6 drinks a day

Regarding cigarette smoking, which of the following statements best describes you?

- ☐ I have never smoked regularly
- ☐ I have given up smoking
- ☐ I am currently smoking

Please select the response which constitutes your daily average consumption of cigarettes.

- ☐ None, not smoking
- ☐ A few per day
- ☐ Half a pack per day
- ☐ One pack per day
- ☐ More than a pack per day

(Note: Seven categories of drug use)

How often, if ever, do you use the following drugs? Your answers will remain STRICTLY ANONYMOUS SINCE THERE IS NO WAY TO IDENTIFY WHICH RESPONSES ARE YOURS. Your answers are for STATISTICAL ANALYSIS ONLY.				
	Never	Sometimes	Often	
Marijuana/hashish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LSD/other hallucinogens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Amphetamines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Cocaine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Heroin/other opiates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Barbiturates/Sedatives/Tranquilizers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Ecstasy/'E'/PCP/Angel Dust	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(Note: overall satisfaction and enjoyment items)

Select the response which best describes how you feel about your work at the present time						
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
I feel fairly well satisfied with my present musical activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
I find real enjoyment in my work as a musician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

How did you hear about this study?

- ☐ From the American Federation of Musicians (AFM)
- ☐ From another musician I work with
- ☐ From another musician, but not someone I work with
- ☐ From a friend or acquaintance who is not a musician
- ☐ From the author of the study
- ☐ Other

(Note: final item is optional; the only open-ended item on the survey)

Thank you for completing this survey. Please type below any other comments you may wish to add, e.g., other stressful factors in your life and work not mentioned in the survey. Any general comments regarding this study or your life as a musician are also welcome.

	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	
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Appendix B

List of 54 Primary and Secondary Musical Instruments (alphabetically listed, read left to right and then down). These were implemented as drop-down menus and therefore not visible in Appendix A.

- | | |
|-------------------------------------|---------------------------------|
| 1. Accordion | 2. Banjo |
| 3. Bass Guitar | 4. Bassoon/Contra Bassoon |
| 5. Cello | 6. Chapman Stick |
| 7. Clarinet (any) | 8. Cornet |
| 9. Double Bass (i.e., upright bass) | 10. Drums |
| 11. Dulcimer | 12. English Horn |
| 13. Euphonium | 14. Flute |
| 15. Guitar (acoustic) | 16. Guitar (classical) |
| 17. Guitar (electric) | 18. Guitar (steel) |
| 19. Harmonica | 20. Harp |
| 21. Harpsichord | 22. Horn/French Horn |
| 23. Mandolin | 24. Marimba |
| 25. Oboe | 26. Organ (Hammond) |
| 27. Organ(electronic) | 28. Organ (pipe) |
| 29. Other | 30. Other (brass) |
| 31. Other (electronic) | 32. Other (keyboards) |
| 33. Other (percussion) | 34. Other (stringed instrument) |
| 35. Other (woodwinds) | 36. Piano (acoustic) |

37. Piano(electric)

39. Sax (alto)

41. Sax (other)

43. Steel Drums

45. Tabla Drums

47. Trombone

49. Tuba

51. Vibraphone

53. Violin

38. Piccolo

40. Sax (baritone)

42. Sax (tenor)

44. Synthesizer

46. Timpani

48. Trumpet

50. Ukulele

52. Viola

54. Voice

Appendix C

List of eighteen categories for primary and secondary musical style items, implemented on the survey as drop down menu items. These were implemented as drop-down menus and therefore not visible in Appendix A.

1. Classical
2. Jazz
3. Blues
4. Country
5. Folk
6. Rock
7. Pop
8. Soul / Rhythm & Blues
9. Hip Hop / Rap / Rapcore
10. Dance / Electronic / Techno
11. Theatre / Broadway
12. Dance Band / Swing Era
13. Religious / Worship / Gospel
14. Reggae / Ska / Dub
15. Latin / International
16. Fusion / Jazz-Funk
17. New Age / Ambient
18. Other

Appendix D

Announcement sent from the College Music Society to its members:

Do people really know what it's like to be a professional musician? Do musicians themselves even know what their peers think and do? A large-scale groundbreaking study from a University of Pennsylvania musician and researcher is attempting to find out.

This study is different from *all* prior studies on musicians in that it is collecting information from diverse geographic areas and many types of musicians. Although the media churns out a continuous stream of images depicting musicians, there is a profound lack of systematically gathered information about musicians' lives; their occupations, attitudes, and behaviors.

Here is an opportunity to weigh in as a musician on issues of importance to all musicians by taking an online survey. The survey is easy to take as nearly all the items are multiple-choice and are responded to with mouse clicks.

Additionally, you don't have to provide *any* personal information as survey responses are anonymous.

The Philadelphia Local of the American Federation of Musicians <http://www.local77afm.org> is supporting this study by providing a link to the survey from its website. The study has also been promoted by Downbeat Magazine, Polyphonic.org, and the College Music Society <http://www.music.org>

No matter what your style of music or musical occupation, get counted by participating. Results will be published and posted so all can benefit.

Please visit my homepage <http://musicianstudy.gse.upenn.edu/> at the University of Pennsylvania to learn more.

Or go directly to the survey site: <http://www.musicianstudy.org>

Thanks for your help!

Emmanuel Angel
University of Pennsylvania
angel2@upenn.edu

Appendix E

(Sample bulk e-mail sent to musicians)

Dear fellow musician,

My name is Emmanuel Angel. I'm a musician and I'm also a researcher at the University of Pennsylvania. Because of my interest in music I am doing my dissertation research on musicians.

I'm writing to you because I need your help. Would you please help this fellow musician by completing a 30-minute online survey?

This study is different from all prior studies on musicians in that it will collect information from diverse geographic areas and many types of musicians. Although the media churns out a continuous stream of images depicting musicians, there is a profound lack of systematically gathered information about musicians' lives; their occupations, attitudes, and behaviors.

You may also learn about the study by visiting my homepage at the University of Pennsylvania:

<http://dolphin.upenn.edu/~angel2/>

I hope to get 1000 musicians from the United States and Canada to complete the survey. I plan to share the results of the survey to help others understand the way musicians think and behave.

I have created a dedicated website, <http://www.musicianstudy.org>, to host the survey and I will post results there when the study is complete.

Here is an opportunity to weigh in as a musician on issues of importance to all musicians. The survey is easy to take as nearly all the items are multiple-choice and are responded to with mouse clicks.

Additionally, you don't have to provide any personal information as survey responses are anonymous.

The Philadelphia Local of the American Federation of Musicians (Philadelphia Musicians' Union Local 77) is supporting this study by providing a link to the survey from its website, so you can be sure this is not a marketing trick or Internet hoax

To take the survey click on this link: <http://www.local77afm.org/>

You will go to the website of the Philadelphia Local (AFM Local 77). Once

there you will see a red text box with the heading “Is music your life?”
Simply click below where it says **CLICK HERE**. (Or if you wish you may go directly to <http://www.musicianstudy.org>)

Finally, may I ask you to forward this message to other musicians you know across North America so I can get as many varied participants as possible? I am seeking responses primarily from those whose main occupation is music. Semi-professionals who work part time as musicians are also welcome to take the survey.

Musicians of all kinds are needed (i.e., classical, jazz, rock, pop, country, folk, Latin, Broadway, fusion, soul, R&B, worship, hip hop, reggae, funk, dance band, rap, etc.), as well as all musical occupations (i.e., composers, instrumentalists, vocalists, educators, arrangers, music directors, producers, songwriters, conductors, etc.).

Thanks for your help!

Emmanuel Angel
University of Pennsylvania
angel2@dolphin.upenn.edu

Appendix F

Table A1

Distribution and Prevalence of Gender in Musician Profile Types

Type	% Female	% Male	Prevalence ^a
+OECA_N	41.2	58.8	Female>Male*
CE_N	36.5	63.5	<i>ns</i>
OAE_CN	28.3	71.7	<i>ns</i>
OE_A	23.4	76.6	Male>Female**
_E	22.2	77.8	Male>Female***
OCAN_	56.4	43.6	Female>Male****
ONC_A	34.0	66.0	<i>ns</i>
+ON_C	44.6	55.4	Female>Male**
+NO_-CAE	21.1	78.9	Male>Female***
Total sample	34.3	65.7	

Note. $N = 1,386$. The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table A2

Distribution and Prevalence of Having Children in Musician Profile Types

Type	% Children no	% Children yes	Prevalence ^a
+OECA_N	48.5	51.5	<i>ns</i>
CE_N	38.4	61.6	Yes>No****
OAE_CN	43.3	56.7	Yes>No**
OE_A	48.5	51.5	<i>ns</i>
_E	52.7	47.3	<i>ns</i>
OCAN_	67.9	32.1	No>Yes***
ONC_A	62.6	37.4	No>Yes*
+ON_C	66.2	33.8	No>Yes**
+NO_-CAE	67.2	32.8	No>Yes**
Total sample	54.5	45.5	

Note. $N = 1,386$. The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table A3

Distribution and Prevalence of Possessing a Graduate Degree in Profile Types

Type	% No	% Yes	Prevalence ^a
+OECA_N	31.4	68.6	Yes > No*
CE_N	39.0	61.0	<i>ns</i>
OAE_CN	44.1	55.9	<i>ns</i>
OE_A	40.1	59.9	<i>ns</i>
_E	47.3	52.7	No > Yes*
OCAN_	25.0	75.0	Yes > No***
ONC_A	37.4	62.6	<i>ns</i>
+ON_C	38.2	61.8	<i>ns</i>
+NO_-CAE	53.9	46.1	No > Yes***
Total sample	39.2	60.8	

Note. $N = 1,386$. The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table A4

Distribution and Prevalence of Musicians Age 45 and Older in Profile Types

Type	% Younger	% Older	Prevalence ^a
+OECA_N	33.5	66.5	Older>Younger***
CE_N	40.3	59.7	<i>ns</i>
OAE_CN	41.7	58.3	<i>ns</i>
OE_A	43.1	56.9	<i>ns</i>
_E	37.1	62.9	Older>Younger*
OCAN_	52.1	47.9	<i>ns</i>
ONC_A	63.3	36.7	Younger> Older****
+ON_C	52.2	47.8	<i>ns</i>
+NO_-CAE	59.4	40.6	Younger> Older**
Total sample	46.2	53.8	

Note. $N = 1,386$. The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

The mean age of the sample is 44.7.

Table A5

Distribution and Prevalence of Musicians Turning Professional at 18 or Younger in Profile Types

Type	% No	% Yes	Prevalence ^a
+OECA_N	53.7	46.3	<i>ns</i>
CE_N	70.8	29.2	No>Yes**
OAE_CN	54.2	45.8	<i>ns</i>
OE_A	56.9	43.1	<i>ns</i>
_E	54.0	46.0	<i>ns</i>
OCAN_	68.7	31.3	No>Yes*
ONC_A	50.0	50.0	Yes>No*
+ON_C	61.8	38.2	<i>ns</i>
+NO_-CAE	58.8	41.2	<i>ns</i>
Total sample	58.6	41.4	

Note. $N = 1,286^b$. The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

^bOnly professional musicians were included (i.e., those who turned pro)

Table A6

*Distribution and Prevalence of 24 or More Years as a Professional Musician in Profile**Types*

Type	% Less than 24 years	% 24 or more years	Prevalence ^a
+OECA_N	34.2	65.8	More>Less****
CE_N	44.4	55.6	<i>ns</i>
OAE_CN	46.6	53.4	<i>ns</i>
OE_A	45.0	55.0	<i>ns</i>
_E	42.0	58.0	<i>ns</i>
OCAN_	58.2	41.8	Less>More*
ONC_A	65.9	34.1	Less>More****
+ON_C	54.2	45.8	<i>ns</i>
+NO_-CAE	52.6	47.4	<i>ns</i>
Total sample	48.4	51.6	

Note. $N = 1,286$ (professionals-only subsample of 1,386).

The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

The subsample mean and median years as a pro musician are 23.9 and 24.0 respectively.

Table A7

Distribution and Prevalence of Marital Status in Musician Profile Types

Type	% Never	% Married	% Separated	% Divorced	%Widowed	Prevalence ^a
+OECA_N	19.6	67.0	1.0	9.3	3.1	Married>Never**
CE_N	19.5	71.1	0.6	8.2	0.6	Married>Never**
OAE_CN	19.7	65.4	2.4	11.8	0.8	<i>ns</i>
OE_A	28.7	51.5	0.6	19.2	0.0	Divorced>married**
_E	27.5	61.7	1.2	7.2	2.4	<i>ns</i>
OCAN_	27.9	53.6	1.4	17.1	0.0	<i>ns</i>
ONC_A	38.1	54.4	0.7	6.8	0.0	Never>Divorced*
+ON_C	38.2	48.4	2.6	10.2	0.6	Never>Married**
+NO_-CAE	36.7	44.5	3.9	14.1	0.8	Never>Married*
Full sample	28.1	57.9	1.5	11.4	1.0	<i>ns</i>

Note. N = 1,386. The sum of percentages for each row is 100%. Never is an abbreviation for Never Married.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method.

p < .05. ** p < .01

Table A8

Distribution and Prevalence of Music Degree, Non-Music Job After School, and AFM Membership in Musician Profile Types

Type	Music degree/diploma			Non-music job after school			AFM member		
	% No	% Yes	Prevalence ^a	% No	% Yes	Prevalence ^a	% No	% Yes	Prevalence ^a
+OECA_N	23.2	76.8	<i>ns</i>	60.3	39.7	<i>ns</i>	68.0	32.0	<i>ns</i>
CE_N	24.5	75.5	<i>ns</i>	59.1	40.9	<i>ns</i>	77.4	22.6	<i>ns</i>
OAE_CN	33.1	66.9	<i>ns</i>	60.6	39.4	<i>ns</i>	70.9	29.1	<i>ns</i>
OE_A	32.9	67.1	<i>ns</i>	56.3	43.7	<i>ns</i>	79.0	21.0	No > Yes*
_E	34.1	65.9	No > Yes*	58.7	41.3	<i>ns</i>	62.9	37.1	Yes > No**
OAN_N	14.3	85.7	Yes > No***	52.9	47.1	<i>ns</i>	66.4	33.6	<i>ns</i>
ONC_A	21.8	78.2	<i>ns</i>	51.0	49.0	<i>ns</i>	75.5	24.5	<i>ns</i>
+ON_C	26.8	73.3	<i>ns</i>	55.4	44.6	<i>ns</i>	75.2	24.8	<i>ns</i>
+NO_-CAE	30.5	69.5	<i>ns</i>	43.8	56.3	Yes > No**	69.5	30.5	<i>ns</i>
Total sample	26.8	73.2		55.7	44.3		71.7	28.3	

Note. $N = 1,386$. All numbers in table are percentages. The sum of percentages for each row of Music Degree, Non-Musical Job, and AFM respectively, is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table A9

Distribution and Prevalence of Mom and Dad Support in Musician Profile Types

Type	Mom Supportive ^a			Dad Supportive ^b		
	% No	% Yes	Prevalence ^c	% No	% Yes	Prevalence ^c
+OECA_N	10.8	89.2	Yes>No**	18.6	81.4	Yes>No***
CE_N	9.4	90.6	Yes>No**	21.4	78.6	Yes>No*
OAE_CN	14.2	85.8	<i>ns</i>	26.0	74.0	<i>ns</i>
OE_A	19.2	80.8	<i>ns</i>	32.3	67.7	<i>ns</i>
_E	22.8	77.2	<i>ns</i>	33.5	66.5	<i>ns</i>
OCAN_	16.4	83.6	<i>ns</i>	27.9	72.1	<i>ns</i>
ONC_A	21.1	78.9	<i>ns</i>	34.0	66.0	<i>ns</i>
+ON_C	21.7	78.3	<i>ns</i>	28.7	71.3	<i>ns</i>
+NO_-CAE	32.0	68.0	No>Yes****	46.1	53.9	No>Yes****
Total sample	18.3	81.7		29.3	70.7	

Note. N = 1,386. All numbers in table are percentages. The sum of percentages for rows in each sections equals 100%.

^aMom and ^bDad support bifurcates 4-category survey responses as *No* (Neutral/Unsupportive/Do Not Know) versus *Yes* (Supportive).

^cIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table A10

Distribution and Prevalence of Improvisational Importance and Improvisational Ability Self-Rating in Musician Profile Types

Type	Improvisational importance no/yes ^c			Improvisational ability self-rating lower/higher ^d		
	% No	% Yes	Prevalence ^a	% Lower	% Higher	Prevalence ^a
+OECA_N	51.5	48.5	<i>ns</i>	51.0	49.0	<i>ns</i>
CE_N	59.1	40.9	<i>ns</i>	61.6	38.4	Lower>Higher*
OAE_CN	47.2	52.8	<i>ns</i>	51.2	48.8	<i>ns</i>
OE_A	50.3	49.7	<i>ns</i>	49.7	50.3	<i>ns</i>
_E	48.5	51.5	<i>ns</i>	47.9	52.1	<i>ns</i>
OCAN_	62.1	37.9	Not>Yes*	61.4	38.6	Lower>Higher*
ONC_A	62.6	37.4	Not>Yes*	57.1	42.9	<i>ns</i>
+ON_C	61.1	38.9	Ns	54.8	45.2	<i>ns</i>
+NO_-CAE	43.0	57.0	Yes>Not	44.5	55.5	Higher> Lower*
Total sample	54.0	46.0		53.2	46.8	

Note. N = 1,386. All numbers in table are percentages. The sum of percentages for each row of Importance and Ability are 100% respectively.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$.

^cImprovisational Importance No/Yes bifurcation indicates (not/somewhat) versus (important/very important) survey responses.

^dImprovisational Ability Lower/Higher bifurcation indicates (little or no/some) versus (good/exceptional) survey responses.

Table A11

Distribution and Prevalence of Current Cigarette Smoking and Usage in Musician Profile Types

Type	Currently smoking			Usage equals one or more packs per day		
	% No	% Yes	Prevalence ^a	% No	% Yes	Prevalence ^a
+OECA_N	91.2	8.8	<i>ns</i>	96.4	3.6	<i>ns</i>
CE_N	92.5	7.5	<i>ns</i>	98.7	1.3	<i>ns</i>
OAE_CN	89.0	11.0	<i>ns</i>	96.1	3.9	<i>ns</i>
OE_A	87.4	12.6	<i>ns</i>	94.6	5.4	<i>ns</i>
_E	90.4	9.6	<i>ns</i>	96.4	3.6	<i>ns</i>
OCAN_	92.1	7.9	<i>ns</i>	96.4	3.6	<i>ns</i>
ONC_A	89.8	10.2	<i>ns</i>	97.3	2.7	<i>ns</i>
+ON_C	91.7	8.3	<i>ns</i>	97.5	2.5	<i>ns</i>
+NO_-CAE	83.6	16.4	Yes>No*	89.8	10.2	Yes>No***
Total sample	89.9	10.1		96.0	4.0	

Note. N = 1,386. All numbers in table are percentages. The sum of percentages for each row of Importance and Ability are 100% respectively.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table A12

Distribution and Prevalence of Several or More Drinks Per Week in Profile Types

Type	% No	% Yes	Prevalence ^a
+OECA_N	51.0	49.0	<i>ns</i>
CE_N	64.2	35.8	No>Yes*
OAE_CN	57.5	42.5	<i>ns</i>
OE_A	45.5	54.5	Yes>No **
_E	60.5	39.5	<i>ns</i>
OCAN_	57.9	42.1	<i>ns</i>
ONC_A	51.0	49.0	<i>ns</i>
+ON_C	55.4	44.6	<i>ns</i>
+NO_-CAE	58.6	41.4	<i>ns</i>
Total sample	55.5	44.5	

Note. $N = 1,386$. The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table A13

*Distribution and Prevalence of Psychosomatic Troubles T-Scores 50 or Greater in**Profile Types*

Type	% Lower troubles	% Higher troubles	Prevalence ^a
+OECA_N	71.6	28.4	Lower>Higher****
CE_N	76.1	23.9	Lower>Higher****
OAE_CN	66.1	33.9	Lower>Higher****
OE_A	56.9	43.1	Lower>Higher*
_E	63.5	36.5	Lower>Higher***
OCAN_	32.1	67.9	Higher>Lower****
ONC_A	25.9	74.1	Higher>Lower****
+ON_C	24.8	75.2	Higher>Lower****
+NO_-CAE	16.4	83.6	Higher>Lower****
Total sample	49.6	50.4	

Note. $N = 1,386$.

The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Table A14

Distribution and Prevalence of Classical Musicians in Profile Types

Type	% Non-Classical	% Classical	Prevalence ^a
+OECA_N	39.7	60.3	<i>ns</i>
CE_N	43.4	56.6	<i>ns</i>
OAE_CN	45.7	54.3	<i>ns</i>
OE_A	44.3	55.7	<i>ns</i>
_E	50.9	49.1	Non-Classical > Classical*
OCAN_	22.9	77.1	Classical > Non-Classical****
ONC_A	40.1	59.9	<i>ns</i>
+ON_C	38.9	61.1	<i>ns</i>
+NO_-CAE	60.9	39.1	Non-Classical > Classical****
Total sample	42.8	57.2	

Note. N = 1,386. The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. **** $p < .0001$.

Table A15

Distribution and Prevalence of Father's History as Pro/Semipro in Profile Types

Type	% No	% Yes	Prevalence ^a
+OECA_N	92.8	7.2	No>Yes*
CE_N	90.6	9.4	<i>ns</i>
OAE_CN	86.6	13.4	<i>ns</i>
OE_A	85.6	14.4	<i>ns</i>
_E	83.8	16.2	<i>ns</i>
OCAN_	85.7	14.3	<i>ns</i>
ONC_A	89.1	10.9	<i>ns</i>
+ON_C	87.3	12.7	<i>ns</i>
+NO_-CAE	87.5	12.5	<i>ns</i>
Total sample	87.8	12.2	

Note. $N = 1,386$. The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$.

Table A16

Distribution and Prevalence of High Satisfaction^b Regarding Current Musical Activities in Profile Types

Type	% No	% Yes	Prevalence ^a
+OECA_N	20.1	79.9	Yes>No****
CE_N	28.9	71.1	Yes>No*
OAE_CN	29.1	70.9	Yes>No*
OE_A	32.3	67.7	<i>ns</i>
_E	39.5	60.5	<i>ns</i>
OCAN_	37.9	62.1	<i>ns</i>
ONC_A	49.7	50.3	No>Yes**
+ON_C	54.8	45.2	No>Yes****
+NO_-CAE	57.8	42.2	No>Yes****
Total sample	38.1	61.9	

Note. $N = 1,386$. The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

^bHigh Satisfaction defined by No/Yes bifurcation of survey item as *No* (Strongly Disagree, Disagree, Neutral) versus *Yes* (Agree/Strongly Agree) survey responses.

Table A17

Distribution and Prevalence of High Enjoyment^c in Work as a Musician in Profile Types

Type	% No	% Yes	Prevalence ^a
+OECA_N	27.3	72.7	Yes>No****
CE_N	52.2	47.8	<i>ns</i>
OAE_CN	44.9	55.1	Yes>No*
OE_A	47.3	52.7	<i>ns</i>
_E	68.3	31.7	No>Yes***
OCAN_	51.4	48.6	<i>ns</i>
ONC_A	67.3	32.7	No>Yes***
+ON_C	59.9	40.1	<i>ns</i>
+NO_-CAE	78.9	21.1	No>Yes****
Total sample	54.3	45.7	

Note. $N = 1,386$. The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

^cHigh Enjoyment defined by No/Yes bifurcation of survey item as *No* (Strongly Disagree, Disagree, Neutral, Agree) versus *Yes* (Strongly Agree) survey responses.

Table A18

Distribution and Prevalence of 35 or More Non-Musical Work Hours Per Week in Profile Types

Type	% Less than 35 hours	% More than 35 hours	Prevalence ^a
+OECA_N	90.2	9.8	<i>ns</i>
CE_N	79.2	20.8	More>Less**
OAE_CN	85.8	14.2	<i>ns</i>
OE_A	81.4	18.6	More>Less*
_E	83.8	16.2	<i>ns</i>
OCAN_	93.6	6.4	<i>ns</i>
ONC_A	86.4	13.6	<i>ns</i>
+ON_C	89.2	10.8	<i>ns</i>
+NO_-CAE	89.8	10.2	<i>ns</i>
Total sample	86.5	13.5	

Note. $N = 1,386$.

The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$.

Table A19

Distribution and Prevalence of \$60,000 Income Yearly in Profile Types

Type	% Less than \$60,000	% \$60,000 or more	Prevalence ^a
+OECA_N	56.2	43.8	More>Less**
CE_N	52.2	47.8	More>Less****
OAE_CN	68.5	31.5	<i>ns</i>
OE_A	56.9	43.1	More>Less**
_E	70.7	29.3	<i>ns</i>
OCAN_	74.3	25.7	Less>More*
ONC_A	74.1	25.9	Less>More*
+ON_C	68.2	31.8	<i>ns</i>
+NO_-CAE	80.5	19.5	Less>More***
Total sample	66.0	34.0	

Note. $N = 1,386$.

The sum of percentages for each row is 100%.

^aIdentification of significant prevalence trends is based on tests of the standard error of proportional differences corrected for simultaneous statistical contrasts by the Bonferroni method. * $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

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