

The Psychophysiological Impact of Burnout in Special and General Education Teachers

by

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Abstract

Teaching is considered to be a stressful occupation. Many teachers experience ongoing stress from a variety of sources, which eventually leads to burnout, and ultimately is reflected in what has become an alarming rate of attrition. The present study examined the relationship between teachers' experiences of stress, burnout, and salivary cortisol levels. A total of 163 general education and special education teachers completed self-report measures of teacher occupational stress (*Teacher Stress Inventory*), psychological distress (*Symptom Check List-90-Revised*), and burnout (*Maslach Burnout Inventory-Educators Survey*). A smaller subsample of teachers provided saliva samples that were analyzed for levels of free and unbound salivary cortisol. Results did not indicate a significant relationship between salivary cortisol levels and subjective measures of burnout. Correlations with teacher occupational stress, and psychological distress interpreted with caution due to low power statistical power as a result of small sample N. Although cortisol levels are unrelated to self reported burnout in the general education sample, daily changes in cortisol levels are positively related to the personal accomplishment subscale of the burnout inventory for special education instructors. Results also indicate that both special and general education teachers reported statistically and clinically significant levels of occupational stress and psychological distress above what is expected when compared to normative samples for each measure.

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CHAPTER I

INTRODUCTION

Since the inception of the Individuals with Disabilities Education Act (IDEA) in 1975, all states that receive federal funding for education must ensure that all students with disabilities between the ages of 3 and 21 receive a free and fair public education. Consequently, over six million children are currently served by what is now called the Individuals with Disabilities Education Improvement Act (IDEIA), representing 12 percent of all students in public primary and secondary school systems. Since the inception of the IDEIA there has been a 35 percent increase in the past ten years of individuals with disabilities in schools. The number of students diagnosed with a learning disability has increased 300 percent since 1976 (Mathison & Freeman, 2006).

With this increase of students qualifying for special education, the demand for qualified special education teachers has become paramount. Assuming continued growth in the needs of this population, which many experts suggest will occur, the special education student population could expand from the current 12 percent of enrollment to 16 percent within a decade. These implications are greater when the cost and challenge of educating this population are considered and even if the rate levels off, conservative estimates remain at around 14 percent (Ingersoll & Smith, 2004). Consequently, there will be an increasing need for qualified special education teachers as long as IDEIA is in existence and funded through the federal government.

Unfortunately, the demand for qualified special education teachers is far outpacing the numbers

who are trained annually, creating a major shortage of special education teachers in the United States (Darling-Hammond & Sykes, 2003).

There is currently a shortage of teachers in the United States, with a critical shortage of special education teachers due in part to attrition. The National Center for Education Statistics (NCES) reports that for the 2004-2005 school year, over one third of teachers in their first year of teaching and almost one fourth of general and special education teachers with one to three years of experience left their profession (Cox, Parmer, Tourkin, Warner, & Lyter, 2007). The attrition rate of teachers who leave the profession after five years is close to 50% and more than one third of teachers leave the profession by the end of their sixth year (Hanushek, Kain, & Rivkin, 2004; Ingersoll & Smith, 2004). Considering special education teachers more specifically, approximately 50% of new teachers leave the field or transfer to general education within the first four years (Darling-Hammond & Sykes, 2003). According to Darling-Hammond and Sykes (2003), schools hired 232,000 special educators in 1999 and 287,000 special educators left the profession in the same year. This means that that when the 1999 school year began, schools were already short some 55,000 instructors with expertise in special education.

Teachers and Stress

One explanation for high special education teacher attrition rates is stress. Research indicates that there are many factors that have been identified as contributing to the increased levels of stress often reported by teachers. For example, contextual factors traditionally identified in the literature to relate to teachers' occupational stress include interpersonal demands (i.e. balancing work personal life), lack of professional recognition, discipline problems in the classroom, the multiplicity of tasks required, bureaucracy, lack of support, workload, time pressure, the amount of paperwork required and lack of resources provided (Burke, Greenglass,

& Schwarzer, 1996; Chan, 1998; Pithers, 1995). Travers and Cooper (1996) reported that teachers' stress was also a result of lack of large class sizes, isolation, fear of violence, lack of classroom control, role ambiguity, and limited professional opportunities.

Work Environment

There is a wealth of research designed to address the reasons why teachers leave the profession before retirement, and more specifically, why so many special education teachers leave special education or leave the field entirely. Research on perceived loss of autonomy has lead some to conclude that when mature adults are forced to work in any environment where they seem to be losing control, conflict will result (Kyriacou, 2001). In a teaching job, this stress may then be reflected in a number of ways. Teachers may physically and psychologically withdraw into their classrooms and cease any attempts to maintain contact with the rest of the school administration. They may try to disrupt the organization, form resistance, or seek promotion as a way of resolving a stressful situation. More extreme measures may involve workers reacting with panic and paranoia, while others may become obsessive, fatigued, or even clinically depressed. Similarly, more recent studies have shown that teachers who are satisfied with the decisions and degree of support provided by school administrators have shown more positive attitudes regarding their occupation (Grayson & Alvarez 2008; Hepburn & Brown 2001).

Unrealistic Expectations

Findings from other studies suggest that anxiety and health problems may stem from teachers unrealistic expectations about the classroom environment. For example, Chorney (1998) asked approximately forty teachers to identify the characteristics of a good teacher. Of the participants, 92 percent responded in a way that indicated unrealistic beliefs about what

defines a good teacher. Most of these beliefs indicated that a “good teacher” is able to handle any student, any classroom, and any situation, at all times. These unrealistic and distorted beliefs run contrary to what is often experienced by teachers in the classroom, creating a sense of dissonance, and can ultimately be the beginning of both physical and mental health problems (Alonso et al., 2004). Bibou-Nakou, Stogiannidou, and Kiosseoglou,(1999) presented four hypothetical case studies of stressful situations to 200 schoolteachers and subsequently tested their responses with a battery of three Likert-type assessment instruments. The participants’ potential for burnout was measured using the Maslach Burnout Inventory (Maslach, Jackson, & Leiter, 1996). Many of the responses they received linked the teachers’ internal characteristics (such as self-blame) to symptoms of burnout. Of particular concern was the teachers’ general worry about classroom discipline. These findings all emphasize the conclusions of recent studies showing that classroom management and discipline are two major sources of teacher stress as indicated by reports on the Teachers Occupational Stress Factors Questionnaire and Teachers Stress Inventory (Fimian, 1988, Friedman, 1995; Geving, 2007; Lewis, 1999;).

Other factors related to teacher burnout beyond organizational and personal components mentioned above include occupational characteristics. Teaching is an occupation with relatively low pay and high responsibility compared to other professions with similar levels of training. This lack of correspondence between employment responsibility and income earned can be a significant source of frustration and stress (Gilroy, 2005). Another potentially stress-inducing feature of the special education is the vague and open assignment of teaching. Research indicates that for special education teachers, frequently there is no clear goal, which may potentially result in over-exertion, especially considering special education classrooms that are

often comprised of students of varying ages and abilities being taught at the same time by one teacher (Krause, 2003).

Changes in Students

While these demands and stressors have consistently appeared in the teacher stress research literature for over 30 years (Kyriacou, 2001), working conditions for teachers have also become more difficult in recent years in several significant ways (Esteve, 2000). Students today are required to come to school earlier in the day than was customary in previous generations, resulting in fatigue and less engagement. Students often come to school less ready to learn, with fewer hours of sleep, less structure in their homes, and more distraction from electronic media (McCarthy & Lambert, 2006; Mössle et al., 2006). Children are more likely than ever to come from families of origin where languages other than English are spoken, often leading to more difficult communication between teachers, children and parents. Furthermore, as single classrooms may include students who are highly variable in their abilities (from grouping processes related to “mainstreaming”, “skill streaming,” and inclusion”) thereby creating classroom environments designed around accommodating larger populations of students at the expense of individual student skills sets. Some researchers also suggest that many parents have moved away from respect, gratitude, and support for teachers to a stance of advocacy for their children. Although advocating for their children is considered a proactive and positive characteristic, it often comes at the expense of and undermines the authority and expertise of the teacher (Lambert, McCarthy, O’Donnell, & Wang, 2010).

No Child Left Behind Act of 2001

Teachers must also contend with the guidelines of the No Child Left Behind Act of 2001 mandates, which outline the requirements for highly qualified teachers and put additional

pressures on the profession (Apple, 2007). NCLB outlines how general and special educators are accountable for the progress of their students, which is assessed not only through statewide achievement testing but also through individualized assessment measures developed directly from the curriculum (Freeman, Mathison, & Wilcox, 2006). As it relates to students with disabilities, teachers must be able to modify the curriculum to meet alternate and modified achievement standards, and they must adapt instruction to address the learning styles of individual students. According to the NCLB mandate, all students must reach proficiency or better levels of achievement by school year 2013-2014, which adds to the other pressures associated with the teaching profession (NCLB, 2008).

Certification status

Recent, research has identified clear evidence that links certification status to special education teacher attrition. In a study of over 1,000 special education teachers from the state of Florida, Miller, Brownell and Smith (1999) reported a higher level of attrition among uncertified teachers than certified teachers. Through their analyses, Miller and colleagues found that certification status was a predictor for exit from the field, but not transfer to general education. Transfer to general education has been shown to account for nearly 20 percent of special education teacher attrition for those leaving special education within the first four years of teaching (Darling-Hammond & Sykes, 2003). In other research, Boe, Cook, Bobbitt, & Terhanian (1998) reported that uncertified special education teachers had a higher incidence of transferring. Earlier research conducted by Boe, Bobbitt, Cook, Whitener, (1997) reported that higher levels of turnover were associated with teachers who were not fully certified for their primary assignment when general and special educator samples were combined, but not for general and special education samples separately, a result of smaller sample sizes. These

findings indicate that special education teachers on provisional or emergency certificate are considered at high risk of leaving and in particular need of support.

Co-occurrence of any of these factors makes teaching stressful, ultimately leading many to conclude that teaching is a more stressful occupation than in previous generations (McCarthy & Lambert, 2006). One result has been that many teachers retire before the official retirement age of 65 years based on symptoms and diagnoses that may be related to stress and burnout (Bauer, Stamm, Virnich, Wissing, Müller, & Wirsching, 2006). One possible explanation for elevated teacher attrition involves the concept of burnout and its accompanying characteristics as illustrated in the current body of research.

Transactional model of stress

The literature on stress and coping provides various models of stress. According to transactional models of stress (Lazarus & Folkman, 1984), a response occurs if perceived demands outweigh perceived coping resources. This can lead to physiological, behavioral, and psychological stress symptoms (Kyriacou, 2001; Lazarus, 1999; Sapolsky, 1998), including health problems and psychological burnout (Ingersoll, 2001). According to this model, the activity expended by an individual (cognitive, emotional, behavioral, physiological reactions) in order to confront a situation perceived to be stressful will or will not enable him or her to overcome this situation. This model emphasizes the importance of the evaluations that the subject makes of the situation (perceived stress) and of his or her own resources (personal resources, social resources). The model also relies on the influence of individual attempts to modify or support the situation or to modify him or her. Based on the many different aforementioned stressors, it follows that often teachers find themselves in situations where the

perceived resources to manage the day-to-day activities are exhausted by the innumerable demands. When these demands out pace the available resources, burnout can develop.

Burnout

Chronic exposure to or experience of stress within the work environment can lead to the development of burnout. Many scholars have attempted to define the construct of burnout. The term was originally coined by Freudenberg in 1975 in an effort to capture the work stress associated with nurses who appeared to be discouraged with and distressed in their jobs. Early research indicates that burnout can be identified through the appearance of fatigue, persistent colds, headaches, insomnia, and exhaustion. These are all considered signs caused by an over-exertion of a person's energy, strength, or resources (e.g., immune system). Behavioral indicators of burnout include anger, irritation, cynicism, paranoia, or even drug use (Stout, 1987). Most authors agree that burnout refers to an extreme form of job stress stemming from the interpersonal demands of certain kinds of employment (Cherniss, 1988; Dedrick & Raschke, 1990; Maslach, 1993). Christina Maslach (1978), often considered the most widely accepted authority on burnout, describes the condition as "a response to the chronic emotional strain of dealing extensively with other human beings, particularly when they are trouble or having problems" (p. 3).

While often defining burnout by its characteristics, most researchers agree that burnout can be attributed to some type of combination of external or environmental causes (Morgan & Krehbiel, 1985). Other researchers explain burnout not as a specific form of stress, but rather as the "chronic inability to cope with stress" (Greer & Greer, 1992, p. 169). In a study by Torelli and Gmelch (1992), stress was determined to be the most common predictor of burnout. Burnout is also frequently defined by the presence of a particular cluster of symptoms including feeling

irritable, tired, angry or frustrated, becoming detached, cynical or apathetic (Gold, 1989; Guglielmi & Tatrow, 1998). Burnout often affects persons who are highly motivated, hard-working, and hold idealistic expectations for the workplace (Hudson & Meagher, 1983).

Although no comprehensive definition for the construct of burnout has been articulated, there seems to be some professional convergence on the definition posed by Maslach (1982). According to Maslach, burnout is described as the experience of symptoms across the domains of emotional exhaustion, depersonalization, and reduced personal accomplishment (1982). These domains are measured using the most widely administered burnout assessment, the Maslach Burnout Inventory (MBI; Maslach, Jackson, & Leiter, 1996). The inventory contains twenty-two statements about the workplace/job and participants' provide a score representing their experienced intensity for each statement. The items load onto three independent factors; Emotional Exhaustion (EE), Depersonalization (DP), or Personal Accomplishment (PA). Resulting scores provide a range that can then be used to determine the individual's experience of symptoms, and more importantly, their current level of burnout across the three domains. There are currently several variations of the MBI including one version specifically designed to measure burnout in teachers. The Maslach Burnout Inventory Educators Survey (MBI-ES) is nearly identical to the original MBI with the exception of changes in wording to reflect the education setting (Maslach, Jackson, & Schwab, 1996).

A worldwide problem

Teacher stress and burnout are non-exclusive issues to the United States or Western cultures more generally, as evidenced by the myriad studies conducted on the topic. Teachers from around the world have described their jobs as stressful, regardless of the age of students taught or the type of school (private vs. public) (Guglielmi & Tatrow, 1998; Kyriacou, 2001;

Maslach, Schaufeli, & Leiter, 2001). Over the last 30 years there has been an increase in the level of interest in studying the stressors in the teaching profession world wide (Friedman, 2006). Studies done in China (Chan, 2002), England (Hastings & Bham, 2003), Israel (Friedman, 1995), the Netherlands (Brouwers & Tomic, 2001), Turkey (Kiziltepe, 2008), Malaysia (Segumpan & Bahari, 2006,) and Greece (Kokkinos, 2007) yielded common themes regarding teacher experiences of stress and burnout.

Kyriacou (2001) defined teacher stress as “the experience by a teacher of unpleasant emotions such as tension, frustration, anxiety, anger and depression, resulting from aspects of his or her work as a teacher” (p. 4). Some authors instead use the term stress to refer to the degree to which work demands cause pressure (Gugliemi & Tatrow, 1998). These work demands are often organized into distinct categories: teaching children with behavior problems, emotional difficulties or learning disabilities (Gallagher & Lambert, 2006; Pratt, 1978), lack of motivation in students, larger class sizes (French, 1993), administrative or institutional issues, too much unnecessary paperwork, workload and time constraints, lack of classroom resources, lack of parental support, lack of administrative support or pressure from administrators, especially pressures related to mandated curricula and instructional strategies (Cooley & Yovanoff, 1996; Kyriacou, 2001; Lambert & McCarthy, 2006; Montgomery & Rupp, 2005; Moriarty, Edmonds, Blatchford, & Martin, 2001).

The Psychophysiology of the Stress Response

While there has been extensive literature focused on teachers, stress, and burnout, there has been a relative dearth of research findings beyond self-report measures, and particularly absent have been physiological assessments of burnout (i.e. cortisol as an indicator of prolonged exposure to stress). Cortisol is often referred to as the body’s main stress hormone (Kirschbaum,

, & Hellhammer 1989). Cortisol secretion has been found to increase in novel and unfamiliar situations that evoke feelings of uncertainty, anxiety, or negative experiences (van Eck, Berkhof, Nicholson, & Sulon, 1996; van Eck & Nicholson, 1994; Kirschbaum & Hellhammer, 1989; Pruessner, Hellhammer, & Kirschbaum, 1999; Steptoe, Copley, Griffith, & Kirschbaum, 2000). Teaching can be considered a job that is marked frequently by novel and unfamiliar situations, anxiety, and negative experiences. As a result, teachers who are experiencing elevated levels of psychological burnout (likely an extremely high and prolonged level of job stress), may also be prone to abnormal fluctuations in the normal cortisol cycle. Consistent with this logic, Lindfors and Lundberg (2002) found that individuals with high psychological well-being had significantly lower salivary cortisol secretion levels than individuals with low psychological well-being. Individuals experiencing burnout are likely to fit into the category of low psychological well-being, and therefore it could be predicted would have elevated levels of salivary cortisol.

Stress (as defined by elevated cortisol levels) is implicated in the etiology of numerous pathological conditions. These include psychological disorders, such as depression and anxiety (Alonso et al., 2004; La Via et al., 1996), as well as medical disorders, including coronary heart disease, hypertension, and diabetes (McEwen & Seeman, 1999). Of particular interest is the robust finding that chronic stress can interfere with the functioning of the body's natural stress system, namely, the sympathetic-adrenomedullary (SAM) axis and the hypothalamic- pituitary- adrenocortical (HPA) axis, in ways predictive of or related to these disorders (McEwen, 1998). In response to threat, the SAM system coordinates the release of catecholamines, triggering increases in heart rate and blood pressure, among other changes, and the HPA axis coordinates the release of glucocorticoids, including cortisol. Although activation of these stress systems facilitates short-term fight-or-flight responses to threats, prolonged or recurrent activation can

compromise the resilience of these systems, laying the groundwork for chronic mental and physical health disorders (McEwen, 1998). It follows then that those experiencing burnout (high stress) will experience elevated salivary cortisol levels, culminating in experiencing symptoms associated with mental illness.

Statement of the Problem

With the reauthorization of IDEIA in 2004, there is a continued emphasis on ensuring that special education teachers meet a basic set of requirements to be eligible to teach in a special education classroom. The IDEIA attempts to provide for highly qualified teachers, meaning that special educators must meet certain requirements and pass certification standards that often differ from general education teachers in their age-based license area. Over the last 10 years, the number of children receiving special education services has grown significantly fueled by federal requirements, assertive parents, and expansive definitions of what constitutes a disability. These factors, in combination with the constant turnover of special education teachers, could bring about a major shift in focus for the nation's education system.

This chapter began by outlining how stressful teaching can be, leading many teachers to leave the profession relatively soon after they start. As a result, teachers have become a heavily studied group in a variety of arenas. Within the burnout literature, of all of the different populations that have been studied to date, teachers represent the largest professional group, comprising 22% of all samples (Schaufeli & Enzmann, 1998; Vandenberghe & Huberman, 1999). From the earliest mention and study of the construct of burnout (the late 1970s), teachers were immediately identified as a group likely to be experiencing this phenomenon (Friedman, 2006). Today, teachers continue to be the largest professional group internationally represented in research on both stress and burnout (Vandenberghe & Huberman, 1999). Both in the United

States and in Germany burnout rates of up to 50% have been reported (Bauer et al., 2006; Byrne, 1999). In the U.S., stress and burnout have been identified as contributors to the shortage and attrition of both general (Burke, Greenglass, & Schwarzer, 1996; Weisberg & Sagie, 1999) and special education teachers (Billingsley, 2005; Edmonson & Thompson, 2000). Early retirement based on health-related reasons has been a concern for several years, and has been on the rise (Burke, Greenglass, & Schwarzer, 1996).

Teaching is a profession that is heavily represented in the current body of literature with regard to burnout. Unfortunately, most of these studies rely nearly entirely on self report measures such as the MBI-ES. Salivary cortisol levels provide a more objective measure and connection between the symptoms associated with burnout and biological distress. Cortisol also provides a more accurate and detailed account of the impact that daily stressors in the education system can have on the internal physiological state of teachers, which may facilitate understanding factors responsible for teacher attrition. The importance of measuring the physiological effect that burnout has on the body cannot be overstated. Through the utilization of specific physiological measures designed to assess the stress hormone cortisol, researchers can more precisely predict the degree to which stressors impact an individual. Teachers are subjected to a wide range of stressors that affect their psychological well-being and subsequently their health. Much time and money is spent by schools to hire, induct, and retain qualified teachers; yet there is still a chronic shortage of qualified educators. This current study will begin to develop a new framework for understanding the relationship between teacher stress and teacher attrition, specifically by identifying relationships between self-report measures of occupational stress, psychological distress, burnout, and more objective physiological markers of stress.

Purpose of this study

The purpose of this study is to examine stress, burnout, and cortisol levels in special education and general education teachers. As the literature on stress indicates, when teachers perceive that there are more demands than they have resources to cope, they experience elevated levels of stress. As stress (indicated by salivary cortisol, measurements of burnout, and teacher occupational stress) increases, this study examines the degree to which the symptoms of psychological distress as indicated by scores on the SCL-90-R increase. An exploratory analysis of the relationship among perceived effects of recent budget cuts on stress, burnout, teacher certification status, and cortisol will also be conducted.

Research Hypotheses

Hypothesis 1:

Special education teachers will have significantly greater psychological distress as indicated by scores on the SCL-90-R and the Teacher Stress Inventory, than will general education teachers.

Hypothesis 2:

Psychological distress, as indicated by scores on the SCL-90-R and Teacher Stress Inventory, will be positively correlated with burnout scores in both general education and special education teachers.

Hypothesis 3:

The difference between morning and evening cortisol levels will be positively correlated with burnout in both general education and special education teachers..

Hypothesis 4:

The difference between morning and evening cortisol levels will be positively correlated with psychological distress as indicated by scores on the SCL-90-R and Teacher Stress Inventory.

CHAPTER II

LITERATURE REVIEW

This chapter is an overview of the current body of literature in psychology, special education, and kinesiology. First, there is a review of the field of special education including an examination of the factors attributed to the chronic shortage of qualified professionals. The origin of burnout from conjecture to its delineation as an empirically validated psychological construct is examined following the review of the special education literature. A more specific three dimensional model of burnout as described by Christine Maslach, the foremost researcher on the topic of the last thirty years, follows the description of the historical development of the concept. With the increased understanding of the psychological make-up of burnout, researchers were able to develop the *Maslach Burnout Inventory*, an instrument with a wide range of applications, including the use of an adaptation for examining burnout in educational settings. Teaching is considered to be a stressful occupation as is described in the section subsequent the discussion of burnout. A wide range of correlates are discussed related to the environmental and occupational influences and demands placed on both general education and special education teachers. The development of the Teacher Stress Inventory (Fimian, 1988) is discussed in relationship to understanding the various occupational stressors that teachers face. Stress is a natural part of everyday living as is discussed next. When a stressful situation is encountered, there are distinct biological mechanisms that are activated in response to the cognitive appraisal of the event. The transactional model of stress is addressed as the primary understanding and conceptualization of how stress impacts an individual, which is described in this section of the

paper. Finally, an analysis of the body's physiological response to stress, with an emphasis on an understanding of the role of cortisol, concludes this chapter and leads into the development of the current study

Teacher shortage

A review of the current educational and psychological literature on burnout reveals a large number of studies focusing on special education, a reflection that this construct is a problem that affects many teachers in the field. More broadly, teaching is considered to be a demanding profession with an inherently high risk for stress and burnout (Dunham & Varma, 1998; Kyriacou & Sutcliffe, 1977). However, the importance of studying burnout in special education instructors is due in part to the chronic shortage of such instructors in both public and private schools that may result from differential levels of job stress.

In one study of more than 46,000 public school teachers, the chronic annual shortage of certified special education teachers was nearly two times that which was found among general education teachers (Boe, Cook, Bobbitt, & Terhanian, 1998). The shortage of special education teachers is a national crisis and affects all regions of the United States with an estimated ninety-eight percent of school districts across the United States experiencing shortages (Bergert & Burnette 2001). This problem will only worsen as teacher retirements increase (Boyer & Gillespie, 2000). Specifically, special education positions remain the most difficult to fill. Recent statistics indicate that of the estimated 300,000 special education positions, more than 30,000 are filled by noncertified teachers with an additional 6,000 left unfilled due to an insufficient number of new teachers (Sach 1999). This shortage of qualified teachers, roughly 12 percent, is persistent throughout the special education system and not limited to any particular type of classroom (i.e. emotional support, disruptive behavior, learning disabilities, etc.).

Compounding the shortage is the fact that the annual turnover rate for special educators is around twenty percent compared to only thirteen percent for general educators (Boe, Cook, Bobbitt, & Terhanian, 1998).

Several states have reported that special education teachers suffer from higher rates of attrition than their general education counterparts (Katsiyannis, Zhang, & Conroy, 2003). For instance, in the states of California and Kansas up to 9.3 percent of special education teachers leave the field at the end of their first year of teaching while 7.4 percent move to general education (Boyer & Gillespie, 2000). Rural schools face an even more difficult challenge in recruiting and retaining qualified personnel in every aspect of special education delivery (Ludlow, 1998). As a whole, the attrition rate among special education teachers has been estimated at 20 percent annually (Boe et al., 1998). Therefore, districts often face a continuous cycle of recruitment, hiring, and induction. The time, energy, and resources that are spent through the process of hiring new special education teachers needs to be considered in relationship to the cost to retain them. This bottom line mentality places an emphasis on the financial investments that schools make in hiring teachers and has become a catalyst for studies focusing on how to retain special education teachers once they have been recruited. What is missing, however, in most of this literature is the impact of a high stress job on the individual teacher. The current body of literature instead focuses primarily on the questions surrounding how to retain teachers, including an examination of the factors that are often associated with elevated levels of stress, which are often considered predictors of teacher retention and attrition, respectively.

In a recent study, researchers surveyed public school special education teachers to find the most frequent factors predicting whether teachers stay, leave, or transfer from special

education classrooms. Consistent with the hypothesis that many teachers are “burned out,” their research indicated that one of the most common factors causing teachers to leave education entirely or to transfer out of special education into general education were perceptions of high stress, often accompanied by insufficient preparation and certification. Furthermore, when teachers who left special education were interviewed, they reported feeling unsupported, unprepared, and overwhelmed by student needs and job responsibilities (Miller, Brownell, & Smith, 1999). Finally, in a study completed in 1995, researchers interviewed special education teachers to determine the incentives and deterrents for individuals in their field and found that one of the main incentives for staying in special education was support of the principal, which was indicated by roughly eighty-eight percent of the respondents. Common deterrents identified included paperwork, high caseloads, number of required meetings, and job stress (Schnorr, 1995). Collectively, these studies reveal that teachers in the field of special education, regardless of classroom type, are more likely to experience elevated levels of stress and burnout than their peers in general education.

Recent statistics from the Bureau of Labor and Statistics (2010) placed the median annual wages of special education teachers who worked primarily in preschools, kindergartens, and elementary schools at \$50,020. The range for the middle 50 percent was \$40,480 to \$63,500. The lowest 10 percent earned less than \$33,770, and the highest 10 percent earned more than \$78,980. For middle school special education teachers the median annual wage was \$50,810 with the middle 50 percent earning \$41,720 to \$63,480. The lowest 10 percent earned less than \$35,180, and the highest 10 percent earned more than \$78,200. Those special education teachers who worked primarily in secondary schools earned the most on average as their median annual wage was \$51,340 with the middle 50 percent earning \$41,810 to \$65,680. The lowest 10

percent earned less than \$35,150, and the highest 10 percent earned more than \$82,000 (Bureau of Labor & Statistics, 2010). The overall increase in teacher salaries over the last twenty years and increase in attrition due to burnout indicates that salary is not as important as previously thought. The tendency for early career teachers to leave the field has also been explained to be a result of the amount of time spent doing job related activities. It was thought that over time, teachers that remain in the field learn to allocate time spent on teaching related activities toward non job related activities (Fore, Martin, & Bender, 2002). However, recent statistics indicate that early career special education teachers spend an average of 55 hours a week at their jobs, which is similar to the number of hours spent by more experienced teachers (SPeNSE, 2000). Although years of experience in the field has been demonstrated to be a protective factor against burnout, it would appear not to be a product of spending less time engaged in work related activities.

Job Satisfaction

As has been discussed previously, there is a considerable body of research that has been generated examining factors leading to the alarmingly high attrition rate among beginning teachers. A factor that is directly related to the experiences of burnout and job stress is job satisfaction. Teacher job satisfaction has consistently demonstrated to be a reliable predictor of teacher retention and commitment (e.g., Perrachione, Rosser, & Petersen, 2008; Shann, 1998). In a recent study, 23% of teachers surveyed reported dissatisfaction with the job of teaching. The teachers also indicated that if given the opportunity to choose a career again they would not choose to enter into the teaching profession (Mertler 2002). Van Houtte (2006) examined the relationships between teacher satisfaction and a variety of workplace conditions including but not limited to school size, administrative control, organizational culture, and group racial composition. Taking into account these occupational stressors, the attrition rate of early career

teachers in relation to feelings of dissatisfaction is not as surprising. This is especially true as related to feeling so dissatisfied with their jobs that they report seriously considering leaving.

Although much research has been conducted on the influences of teacher satisfaction, this particular research will instead focus on the outcomes of teacher satisfaction on the individual teachers, and ultimately on retention. According to Cranny, Smith, and Stone (1992), work satisfaction has been correlated to a multitude of physical, psychological, demographic, and workplace variables. For instance, teachers who indicate being satisfied with their jobs reported experiencing fewer physical and psychosomatic symptoms than those teachers who were dissatisfied with their jobs (Fox, Dwyer, & Ganster, 1993). There is also research indicating that a lack of satisfaction with one's work is associated with increased feelings of anxiety and depression as well as both poor physical and psychological health (Hongying, 2007).

Early investigation with general education teachers indicates that when teachers experience job dissatisfaction, the success of their students suffers and teachers are less willing to continue teaching (Fox, Dwyer, & Ganster, 1993). These findings have since been indicated with special education teachers as well. Those who report higher levels of job satisfaction are more likely to intend to remain in the field (Stempien & Loeb, 2002). On the other hand, when teachers report high levels of job dissatisfaction, they are more likely to intend to leave the field of special education (Gersten, Keating, Yovanoff, & Hamiss, 2001; Singh & Billingsley, 1996). Studies indicate that often special education teachers experience less job satisfaction than their general education colleagues (Stempien & Loeb, 2002). General education teachers reported higher levels of job satisfaction than special education teachers of students with emotional and behavioral disorders. These results are in line with previous research that has shown that special education teachers of students with emotional and behavioral disorders report significantly lower

rates of job satisfaction (Abelson, 1986; Singh & Billingsley, 1996) and the highest attrition rates (Miller, Brownell, & Smith, 1999) when compared with other subgroups of special education teachers. It is important to note however that although special education teachers have been shown to have higher overall rates of attrition than general educators in several states (Katsiyannis, Zhang, & Conroy, 2003), most studies that did not delineate between subgroups of special educators by disability categorization did not find such a difference between general and special educators (Cross & Billingsley, 1994; Darcy, Kusznirow, & Lester, 1995).

Job satisfaction has been the most frequently investigated variable in organizational behavior (Spector, 1997). Job satisfaction varies and researchers, for example Peretomode (1991) and Whawo (1993), have suggested that the higher the prestige of the job, the greater the job satisfaction. Many workers, however, are satisfied in even the least prestigious jobs. That is, they simply like what they do. In any case, job satisfaction is as individual as one's feelings or state of mind, making it a difficult construct to define and to measure. Job satisfaction can be influenced by a variety of factors, for example, the quality of one's relationship with their supervisor, the quality of the physical environment in which they work, the degree of fulfillment in their work, etc. However, there is no strong acceptance among researchers to indicate that increased job satisfaction produces improved job performance. In fact, it has been demonstrated that improved job satisfaction can sometimes decrease job performance (War, 1998). Hackman and Oldham (1975) suggested that jobs differ in the extent to which they involve five core dimensions: skill variety, task identity, task significance, autonomy, and task feedback. They further suggested that if jobs are designed in a way that increases the presence of these core characteristics, three critical psychological states can occur in employees: (1) experienced meaningfulness of work, (2) experienced responsibility for work outcomes, and (3) knowledge of

the results of work activities. According to Hackman and Oldham, when these critical psychological states are experienced, work motivation and job satisfaction will be high.

Job satisfaction remains an important component in understanding teacher attrition and burnout. Although the current body of literature primarily aims to identify correlates predicting job satisfaction, it is just as important to understand the impact that job satisfaction has on the overall stress. Although there are many factors that relate to special education teachers leaving the profession or changing to general education, an often overlooked factor is the potential physical impact of stress on the body. In order to begin filling this research lacuna, it is important to establish a link between the current shortage of special education teachers and the physiological impact of stress by empirically defining the constructs believed to be at work. One of the most widely studied theoretical constructs in the stress-related educational literature is burnout.

Burnout

Theory Origin

Some of the earliest research on burnout theory appeared in the mid-1970s (Freudenberger, 1974, 1975; Maslach, 1978). This research provided the initial description of the phenomenon, gave it a name, and then was able to demonstrate that it was more than just an occurrence in only a minority of individuals; that is, burnout occurred with more frequency than previously thought. It was a psychiatrist by the name of Herbert Freudenberger that coined the term burnout, making it an official and professionally studied topic for the first time in 1974. Freudenberger (1974) described the construct as "to fail, to wear out, or become exhausted by making excessive demands on energy, strength, or resources" (p.159). These early theoretical developments chiefly surfaced as a result of work with health care workers, primarily nurses,

who had become demoralized while caring for drug addicts (Farber, 2000). It was Freudenberg's belief that in the face of such stress, workers would attempt to work harder as a way to compensate for the feelings they were developing towards the job, and in order to be able to complete the tasks at hand (Freudenberger, 1977).

Although Freudenberg was the first to use the term burnout to refer to a specific set of psychological distress symptoms, Greene (1960) first used a form of the term in the novel *A Burnt-Out Case*. In the story, a worn-out and disconnected architect, who, having lost his motivation to work, was said to be unable to laugh, cry, or express any kind of enjoyment. The treating physician in the novel identified the cluster of symptoms experienced by the architect as an indication that he was “*burnt-out.*” Although this was one of the first times that these symptoms were explicitly linked to the human body, this association was considered to be weak at best, primarily due to the fact that symptoms such as the inability to laugh or suffer did not provide the typical physical signs of injury. This early literary notion of burnout was never truly considered related to any legitimate health concern, leaving it all but ignored by the academic community over the next decade (Maslach & Leiter, 1997). After the initial publication of *A Burnt Out Case*, the construct was given little scholarly consideration, and was described as “pop psychology” (Maslach, 1998, 398), a “fad” (Farber, 2000, p. 689), and “psychobabble” (Schwab, 1983, p. 21).

During the 1980s, the construct of burnout and burnout research began to evolve rapidly. The discussion continued around Freudenberg's early work on burnout, leading researchers to conclude that Freudenberg's belief (1980) that workers worked harder when faced with emotional exhaustion was fundamentally flawed. Rather, Maslach and Pines (1977) and Maslach and Jackson (1981) found the opposite, namely work productivity deteriorated. This belief in

deterioration of work quality continued to dominate the understanding of burnout as a psychological construct up to and including the present time (Maslach & Jackson, 1981; Maslach et al., 1996). Accumulating empirical evidence suggests that burnout is a process that gradually develops across time (Maslach & Leiter, 1997; Schaufeli & Enzmann, 1998).

The experience of burnout has been discovered to also be contingent upon the overall intensity and duration of the environmental demands. Much of this grew out of the literature on teachers because many times teachers are faced with a wide variety of stressors from state education boards, school districts, individual schools, budget issues, class size/case load, and even the make up of any particular class from year to year (Schnorr, 1995). Many of these factors are outside of the control of teachers, resulting in a decreased sense of autonomy and an increased sense of isolation. From a perspective that accounts for the sheer number of sources of stress, teachers became a standard for studying the construct. As a result, teachers have become one of the most commonly studied groups in the area of burnout. According to Schaufeli and Enzmann (1998), teachers represent the largest homogeneous occupational group investigated in the burnout research. Studies utilizing teachers comprise nearly 22% of all samples. Taking into consideration the statistics of teacher attrition mentioned above, it becomes much easier to see why teachers are so frequently studied. Teachers are typically easier to study compared to other professions. Taken as a whole, the environment that teachers work in is structured, controlled, marked by routine, and time limited. A school year has a beginning and an end, and then the cycle begins again. This helps to eliminate the influence of other variables, something not so clear when analyzing the environments of other professions.

The concept of burnout was further popularized with the development of the Maslach Burnout Inventory (Maslach & Jackson, 1981). Before the development of this instrument,

according to the first major review of the burnout literature, there were at least 48 different definitions of the construct (Perlman & Hartman, 1982). The development of the MBI created a more cohesive theoretical framework and resulted in greater universal acceptance of the concept within the professional and academic communities. Furthermore, the MBI has become the gold standard by which the construct is measured and has been used to conduct research with individuals in occupations ranging from health care professionals (Farber, 2000; Maslach & Jackson, 1981; Maslach et al., 2001) to teachers (Farber, 2000).

A Three Dimensional Construct

According to the most widely accepted and researched definition, burnout is conceptualized as a three-dimensional construct consisting of the domains of emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach & Jackson, 1981; Maslach & Schaufeli, & Leiter, 2001). These domains are also often conceptualized based on their cognitive components. There is a basic stress component, an interpersonal component, and a self-evaluation component. The most widely used tool for measuring burnout across the three domains is the Maslach Burnout Inventory (MBI, Maslach, Jackson, & Leiter, 1996). Emotional exhaustion, which refers to feelings of being depleted of one's emotional resources, is regarded as the basic individual stress component of the syndrome. Depersonalization, referring to negative, cynical, or excessively detached responses to other people at work, represents the interpersonal component of burnout. Finally, reduced personal accomplishment refers to feelings of decline in one's competence and productivity, and to one's lowered sense of efficacy, representing the self-evaluation component of burnout (Maslach, 1993). Currently, over 2,000 studies have used the MBI to assess burnout, making this assessment tool the most widely accepted standard for measuring the construct (Schaufeli & Enzmann, 1998). The rapidly

growing use of teachers to study burnout led to the publication of the Maslach Burnout Inventory-Educators Survey (MBI-ES, Maslach, Jackson, & Schwab, 1996).

Burnout Assessments Among Teachers

Teachers may be at greater risk for depersonalization because their daily work life often includes large doses of isolation from their professional peers. While teachers do interact with others on a regular basis throughout the workday, the majority of such interactions are with students, and not with other teachers or professional staff members who might better understand the demands teachers face. The physical layout of most schools, with teachers working alone in their classrooms, and scheduling constraints that make finding time to meet with peers virtually impossible, can then cause teachers to feel disconnected, a frequently reported symptom in the depersonalization domain (Bennett & LeCompte, 1990). This depersonalization may act as a protective mechanism, as evidenced by the descriptions of "worn-out" teachers, whose cynical views towards students and teaching allowed them to continue to remain in the field, even in a diminished capacity (Farber, 2000). While depersonalization may provide some protection against burnout, the isolation it ultimately results in may actually intensifying the risk for burnout in the long run.

An important finding from early studies was that teachers at risk for burnout came to see their work as wasted and contradictory with the ideals or goals they held when they began working (Bullough & Baughman, 1995). Other early studies cited role conflict and role ambiguity as significantly related to burnout (Dworkin, 1986). Role conflict occurs when a teacher is faced with conflicting expectations of the job. For example, role conflict may arise from discrepancies between competing ideals of what it means to be a good teacher. Role

ambiguity relates more to a sense of confusion about one's goals as a teacher, including a sense of uncertainty about the responsibilities related to teaching.

Stress

Transactional Model of Stress and Teachers

Lazarus and Folkman (1984) proposed a transactional model of stress that hypothesized that when a person encounters life demands, a reflexive transaction occurs in which the person weighs perceived demands of the event against her/his perceived capabilities for coping with it. When the transaction results in a perception that one is facing demands that outweigh available resources for coping, the stress response ensues (Sapolsky, 1998). According to current models of stress and coping, burnout can be viewed as the result of unsuccessful attempts to deal with life (or work) demands (McCarthy, Kissen, Yadley, Wood, & Lambert, 2006). In other words, teachers may be more susceptible to burnout symptoms if they perceive an imbalance between the demands they face in their jobs and the resources they have for coping with these demands. Maslach and Leiter (1997) noted increasing interest in viewing burnout in terms of a job-person fit and in the school context burnout could be viewed as a poor fit between the demands of the classroom and teachers' resources for coping with these demands. LeCompte and Dworkin (1991) developed a more extensive description of burnout as an extreme type of role-specific alienation with a focus on feelings of meaninglessness, especially as this applies to one's ability to successfully reach students, a finding also supported by Farber (1998). LeCompte and Dworkin (1991) identified powerlessness in defining professional roles as being instrumental in creating stress. Additionally, a sense of both physical and mental exhaustion exacerbated by the belief that expectations for teachers are constantly in flux, or in conflict with previously held beliefs, has been cited by numerous researchers as influencing teacher burnout (Brown & Ralph,

1998; Bullough & Baughmann, 1997; Hinton & Rotheiler, 1998; Esteve, 2000; Troman & Woods, 2001).

General Adaptation Syndrome

Although burnout was not officially in the psychological lexicon until Freudenberger's 1974 publication, the theoretical underpinnings were in place well before that time. In fact, according to Schaufeli and Enzmann (1998) a more detailed examination reveals that a description of burnout can be found in medical studies on stress by Cannon in 1914 (1929) and in the description of the central character in Thomas Mann's book entitled *Buddenbrooks* (1922). It was however not until Hans Seyle (1956) revolutionized the medical field with his proposal of nonspecific bodily reactions to many types of demands made upon it, suggesting a link between cognitive processes/appraisals and physiological events, that burnout became a valued domain of scientific inquiry. However, many of his early examples of demands tended to be physical rather than the psychological or social demands that correspond to how burnout is defined today, particularly as it relates to employment domains. Through a series of studies, Seyle described what has become to be known as the General Adaptation Syndrome (GAS), with its three distinct stages of alarm reaction, resistance, and exhaustion. Since Seyle's seminal 1956 publication, subsequent studies became more comprehensive by including psychological demands, such as an individual's employment and lifestyle. Seyle maintained that psychological stressors have physical effects just as physical stressors do, and Maslach (1993) has observed that the overwhelming bulk of interest and effort in the field was concerned with this type of psychological stress rather than with the physical stressors. It is this connection with Seyle that grounds the concept of burnout in the psychological literature. A more careful examination of the stages often associate with burnout can help to illuminate this connection more clearly.

The alarm reaction is the first stage in the GAS response. During alarm, the body releases adrenaline and a variety of physiological mechanisms are enacted in order to combat the stress and remain in control. This is called *fight or flight response*. Walter Cannon's explanation that the *fight or flight* response is our body's primitive, automatic, inborn response that prepares it to fight or flee from perceived attack, harm or threat to its survival remains the dominant theory to date (Esteve, 2000; Troman & Woods, 2001). Physiological reactions such as the tensing of muscles, the heart beating more rapidly, increases in breathing and perspiration, dilation of pupils, and the tightening of the stomach are all associated with the alarm stage. From an evolutionary perspective, this response can be understood as a way to protect the individual from predators or a dangerous environment. In typical conditions, once the cause of the stress is removed, the body will go back to normal (Troman & Woods, 2001).

If the stressor is not removed, GAS enters the second stage called resistance or adaptation. This is the body's effort toward long term protection. The body responds by secreting more hormones as a way to increase blood sugar levels to sustain energy and raise blood pressure. It is at this point that the adrenal cortex produces hormones called corticosteroids for this resistance reaction. Overuse by the body's defense mechanism in this phase can eventually lead to disease (Tselbis, Moulou, & Illias, 2001). If this adaptation phase continues for a prolonged period of time without periods of relaxation and rest to counteract the stress response, sufferers become prone to fatigue, concentration lapses, irritability and lethargy as the effort to sustain arousal slides into negative stress (Wood, Wessely, Papadopoulos, Poob, & Checkly, 1998).

The third stage of GAS is called exhaustion, the stage most consistent with the actual concept of burnout. In this stage, the body has run out of its reserve of energy and immunity.

There is a drastic depletion of mental, physical and emotional resources (Tselbis, Moulou, & Illias, 2001). Blood sugar levels decrease as the adrenals become exhausted, leading to decreased stress tolerance, progressive mental and physical exhaustion, and ultimately illness and physiological disintegration (Wood, Wessely, Papadopoulos, Poob, & Checkly, 1998).

Cognitive Components

The GAS illustrates the connection between physiological and psychological events. However, there is a more complex underlying set of cognitive processes that provide continuous evaluation of the situation within each stage. The first stage is characterized by an imbalance between resources and demands (stress). In the context of teachers, substantial stress is caused by the emotionally demanding relationships with others (e.g., students, parents, colleagues, administration, and personal accountability for student achievement) that eventually may result in the depletion of one's emotional resources (Maslach et al., 2001). Next, a set of negative attitudes and behaviors develop, including what can become a tendency to treat students in a detached and mechanistic manner. Often, as detachment occurs, the next component in this stage is a cynical preoccupation with gratification of one's own needs. Essentially, these negative attitudes and behaviors that add up to the depersonalization component of burnout can be considered a type defensive coping mechanism. In order to reduce emotional exhaustion, the burnout candidate creates a psychological distance in an attempt to protect himself or herself against the stressful social environment (Farber, 2000). This becomes increasingly more unproductive and leads to an increase in stress rather than a decrease because it reduces the relationship with students and exacerbates interpersonal problems (Esteve, 2000; Troman & Woods, 2001). As a result, the teacher is less effective in achieving his or her goals so that personal accomplishment diminishes and feelings of incompetence and self doubt might begin to

develop. This sense of reduced personal accomplishment is considered to comprise third component of the burnout syndrome (Maslach et al., 2001). Although recent studies indicate that individuals experiencing burnout also report depressive symptoms, other evidence indicates that the three domains in burnout are indicative of a broader set of symptoms than is associated with depression (Tselbis, Moulou, & Illias, 2001; Leiter & Durup, 1994).

Physiology

Walter Cannon, a physiologist at Harvard, is often given credit for being the first to describe the stress response in terms of fight-or flight. He noted that the body prepared to react to stress in one of two ways: either to attack and defend oneself, or to escape the dangerous situation. When the body engages in the fight-or-flight sequence, it only takes a matter of seconds. As a result, this type of stress is understood as being acute. This acute stress is often considered necessary and unavoidable as an individual navigates through life. While acute stress does have an immediate physiological impact on the body, it is not typically considered a health risk. It is often the cognitive appraisal of the stressful situation that can begin to move more toward chronic and unhealthy stress. This cognitive appraisal that occurs during the stress response process has an enormous impact on how any given stressful event is interpreted (Cohen & McKay, 1984). The effects of stressful life events are reduced or augmented by the perceived availability of resources on hand to manage the stressful events (Lazarus, 1966; Lazarus & Folkman, 1984; Moos & Billings, 1982). As a result, stressful events are less harmful to an individual who perceives a high degree of resources available for coping with the event (i.e., coping efficacy). This perception leads the person to interpret these events less negatively, which has a potentially mitigating impact on the individual (Cohen, 1984; Cohen & McKay, 1984).

Transactional model of stress

It is how a person interprets a situation that is important in understanding the perceived stressfulness of an event and its consequences for health. Those appraisals that are more negative will lead to greater emotional distress (Lazarus, 1966; Lazarus & Folkman, 1984). What follows is an illustration of the interaction between the Transactional Model of Stress as it relates to evaluating and coping with stressful events. Stressful experiences are construed as person-environment transactions. These transactions depend on the impact of the external stressor. This is mediated primarily by the person's appraisal of the stressor and secondarily on the social and cultural resources at his or her disposal (Antonovsky & Kats, 1967; Cohen 1984: Lazarus & Cohen, 1977).

When faced with a stressor, a person evaluates the potential threat (primary appraisal). *Primary appraisal* is a person's judgment about the significance of an event as stressful, positive, controllable, challenging or irrelevant. Facing a stressor, the *secondary appraisal* follows, which is an assessment of the individual's coping resources and options (Cohen, 1984). Secondary appraisals address what one can do about the situation. Both types of appraisal are considered to be part of an ongoing process and the terms primary and secondary are not indicative of occurrence in time, rather are used to differentiate the processes associated with each. According to the transactional model of stress, coping is defined as the constant changing of cognitive and behavioral strategies to manage particular external and/or internal demands that are perceived or appraised as challenging, or exceeding the resources of the individual (Lazarus & Folkman, 1984). Actual *coping efforts* aimed at regulation of the problem give rise to *outcomes* of the coping process. When the perceived demands are determined to be more than what the coping efforts can provide, it follows that an elevated level of stress occurs.

Cortisol

At the biological level, exposure to threats (or stressors) results in the activation of two major endocrine systems, the hypothalamic-anterior pituitary-adrenal axis (HPA) and the sympatho-adrenomedullary axis (SAM). Activation of the HPA is associated with the release of glucocorticoids from the adrenal cortex, primarily cortisol, and the activation of the SAM axis leads to a release of adrenaline (Herman, Ostrander, Mueller, & Figueredo, 2005). The physiological role of the activation of both components of the endocrine system has the overall effect of increasing energy production in the face of stress in systems necessary for survival (i.e., circulatory or respiratory), at the expense of processes that are not considered necessary for immediate survival (i.e., reproduction or immune system) (De Vente, Olf, Van Amsterdam, Kamphuis, & Emmelkamp, 2003; Sapolsky, 1998). Functionally, the release of cortisol plays an integral role in many basic biological processes including proper glucose metabolism, blood pressure regulation, insulin release, immune function, and inflammatory response (Sapolsky, 1998).

When the HPA is activated and cortisol is released in response to stress, it deregulates the normal cortisol cycle in the body. A normally functioning human endocrine system cyclically regulates the release of cortisol such that there is a higher concentration of the hormone present in the mornings, progressively decreasing throughout the day and is at its lowest level in the evenings. The awakening cortisol response (ACR) is the discrete and distinctive part of the cortisol circadian cycle. In most healthy adults, salivary free-cortisol levels increase by approximately 50 % to 160 % in the first 30 min immediately upon awakening (approximate average increase of 9 $\mu\text{g/dL}$, with a range from 4–15 $\mu\text{g/dL}$). Then, throughout the day levels of cortisol in healthy adults will progressively diminish until the lowest levels are observed at

bedtime. This decrease in cortisol concentrations over the course of the day is called the recovery response and is determined by the difference between the highest concentration in the morning and the measure at the end of the day (Herman, Ostrander, Mueller, & Figueredo, 2005). As a result, research has shown that the differentiation between cortisol levels obtained in close proximity to waking and those taken progressively later in the day and into the evenings, over the course of several days, would be a primary indication of prolonged exposure to stress, which increases the possibility of negative consequences on physical health (i.e., a greater difference between morning and evening cortisol levels as indicative of chronic stress; Pruessner, Hellhammer, & Kirschbaum, 1999).

Summary

Prolonged exposure to stress can lead to a deregulation from the normal cortisol fluctuations, leading to increased levels of the hormone in the body for extended periods of time, creating a physiologically heightened state of arousal. This prolonged exposure to elevated cortisol has been implicated in numerous negative biological consequences including, impaired cognitive functioning, decreased thyroid function, imbalances in blood sugar regulation, decreases in bone density and muscle tissue, high blood pressure, suppressed immune functioning, and an ongoing overwhelming feeling of physical and emotional exhaustion (Miller, Cohen, & Ritchey, 2002).

Although the body's general physiological response to stress is often adaptive, allowing an individual to cope in emergency crisis ("fight or flight" response, Cannon, 1929), the impact of cortisol is not uniformly positive across all domains of functioning. For example, it has been demonstrated that increased glucocorticoid levels through stress exposure can have impairing effects on cognition, declarative memory, working memory, autobiographical memory and in

attentional processes. These effects have been primarily attributed to the fact that glucocorticoids are lipophilic and are able to pass the blood-brain barrier with relative ease. Once in the brain, glucocorticoids have been shown to influence multiple regions, including the hippocampus (important in memory), the amygdala (important in emotion), and the prefrontal cortex (important in higher order cognitive processes). It is the impact on the amygdala and prefrontal cortex that provide the clearest link between increased cortisol in relation to mental health.

Stress can also lead to an increase in levels of anxiety, and a corresponding increase in affect-evoked intrusive thoughts (Sullivan, Neale, & Kendler, 2000). In the case of those chronically exposed to stressors, this can have a cumulative impact on both physical and mental health. Continual stress disrupts the cycle. Instead of shutting off once the crisis is over, the process is maintained and the hypothalamus continues to signal the adrenals to produce cortisol. This increased cortisol production exhausts the stress mechanism, leading to fatigue and depression. Cortisol also interferes with serotonin activity, furthering the depressive effect (Knorr, Vingerg, Kessing, & Wetterslev, 2010). This explanation offers evidence that the experience of burnout could realistically lead to elevated cortisol levels (or a deregulation of the normal daily cortisol rhythm, as will be explained in more detail to follow), which in turn could increase the likelihood of an individual experiencing heightened symptoms associated with mental illness (i.e., depression and anxiety). Recent studies have also provided some evidence for abnormalities in the HPA system regulation and subsequent experiences of panic disorder (Gorman, Kent, Sullivan, & Coplan, 2000). A dysfunctional HPA axis has also been associated with manifestations of psychosomatic and psychiatric disorders. For example, HPA

hyperactivity is often found in major depression and also seems to be associated with susceptibility to infectious diseases and cardiovascular problems (Knorr, et al., 2010).

Burnout creates a state of chronic arousal of the HPA, which the body interprets as preparation to survive the stressor and ready itself for a return to homeostasis. It is the ideal response to the short terms stress, but burnout develops over time as a result of chronic stress. Under chronic stress conditions a person is in a constant state of preparedness for danger and it is this type of distress that then increases one's susceptibility to disease (Knorr, et al., 2010). When the stress response is activated for too long, too frequently, and for non-physiological reasons (i.e. psychological and social stressors), there is a greater risk for disease (Sapolsky, 2002). Special education teachers are faced with a wide range of demands during a given day without an outlet that would typically be present in response to increased physiological arousal (Knorr, et al., 2010). These demands tax the available resources, and over time, without some way to interrupt this stress response, teachers can become vulnerable to a wide variety of negative consequences.

CHAPTER III

METHODOLOGY

Participants

After receiving Institutional Review Board (IRB) and Biological Use Authorization approved by the Institutional Biosafety Committee, superintendents of 11 school districts in Eastern Alabama were contacted via email (Appendix A) and invited to participate. After receiving permission from 3 of the 11 school districts, emails (Appendix B) were sent to the principals of all middle and elementary schools in those districts.

Participants were recruited from 8 different elementary and middle schools in Eastern Alabama and Southwestern Ohio. Two-hundred and fifty questionnaire packets were distributed across the six schools. One-hundred eighty-seven packets (187) were returned (75% return rate) and of those, 14 were excluded from analysis due to incomplete vital information. One hundred and sixty three teachers were included in the final analysis. Sixty-two special education teachers between the ages of 24 and 58 ($M=39.4$, $SD=9.4$) and one hundred and one general education teachers between the ages of 23 and 61 ($M=43.8$, $SD=10.4$) provided complete questionnaires. Special education teachers averaged 13.1 years of teaching experience and general education teachers average 17.3 years of teaching experience.

Of the 250 questionnaire packets, 50 packets contained the necessary materials and instructions for providing salivary cortisol samples. Twenty four sets of saliva samples were returned (48% return rate), of which 23 participants had returned the nine completed saliva samples. Sixteen of these were utilized for salivary cortisol assays. The sixteen selected for

analysis were placed into matched groups (8 general education and 8 special education teachers) and of the 23 completed samples, the 16 obtained the highest overall burnout scores on three domains from the MBI-ES (Personal Accomplishment, $M=25.6$, $SD=10.1$; Depersonalization, $M=38$, $SD=9.3$; Emotional Exhaustion, $M=21.9$, $SD=5.3$). The seven participants providing saliva samples that were not included in the cortisol analysis obtained the lowest overall burnout scores on the three domains from the MBI-ES (Personal Accomplishment, $M=21.4$, $SD=6.8$; Depersonalization, $M=11.0$, $SD=4.9$; Emotional Exhaustion, $M=17.0$, $SD=7.5$). Selection based on extreme scores was done in an attempt to best identify the relationship between increases in self report of burnout and salivary cortisol levels and has been utilized in previous research (see Grossi, Perski, Ekstedt, Johansson, Lindström, & Holm, 2005).

Self Report Measures

Demographics Questionnaire. Participants were asked to complete a demographics questionnaire (Appendix C) containing information regarding age, sex, race/ethnicity, number of years teaching, type of classroom, medication taken, highest level of education completed, degree earned (i.e., special education degree vs. alternative certification with degree in other field). The items on this measure were created by the researcher, based on the needs of the study. In order to be better able to capture differences, teacher certification status was grouped based on the ages certified to teach. For general education teachers the categories included were certifications for early childhood (preschool-3rd grade), elementary education (kindergarten-6th grade), or those that hold both certifications (preschool-6th grade). For Special Education teachers, early childhood (birth-3rd grade), collaborative (kindergarten-6th grade), or both certifications (birth-6th grade). To capture how teachers obtained certification participants were placed into one of 4 group. The first group contained teachers who had a Bachelor's degree in

an education related field. The second group contained teachers who had a Bachelor's degree in a non-education related field and obtained certification through completing another Bachelor's degree in education. The third group was comprised of teachers who had a non-education related Bachelor's degree and then obtained certification through completing a Bachelor's degree in education and a Master's degree in education. The fourth group contained teachers who obtained both a Bachelor's and Master's degree in an education related field. Demographic variables for Special Education Teachers are listed in Table 1 and General Education Teachers are listed in Table 2.

The Teacher Stress Inventory (TSI). The Teacher Stress Inventory (Fimian, 1988) was used to assess occupational stress. The TSI measures 10 factors that comprise the construct of teacher stress, and is composed of 49 items. Five factors represent sources of stress and five represent manifestations of stress. Stress strength is rated on a 5-point Likert-type scale (1= no strength; not noticeable, to 5 = major strength; extremely noticeable). A score ranging from 1 to 5 is calculated for each of the five source factors and five manifestation factors by computing the average for the items in on each scale. The total stress score is used to determine where teachers fall on a continuum of more to less occupational stress and is calculated by taking the average of all 10 subscale scores and can range from 1 to 5 (Table 2), with higher scores indicating increased stress.

Research to establish content validity was assessed using expert opinion over a 5-year period. All items were demonstrated to be valid; however, the most relevant items were: feeling unable to cope and experiencing physical exhaustion (Fimian, 1988). Construct validity was assessed using factor analysis, which supported and identified the 10 subscales: time management, work-related stressors, professional distress, discipline and motivation,

professional investment, emotional manifestations, fatigue manifestations, cardiovascular manifestations, gastronomical manifestations, and behavioral manifestations (Fimian & Fastenau, 1990). Research based on a sample using 3,401 teachers from seven states helped to establish and strengthen the TSI's reliability and validity, with reported internal consistency reliability estimates ranging from .75 to .88 (Vance, Nutter, & Humphreys, 1989). Scores obtained were compared to the cutoffs provided by the author as listed in Table 3.

Maslach Burnout Inventory-Educators Survey (MBI-ES). The MBI-ES is an adaptation of the MBI-Human Services Survey (HSS) with some items modified to specify teacher content (Maslach, Leither, & Jackson, 1996). The administration of MBI-ES utilizes the same procedures as the MBI-HSS and the same key is used for scoring. According to the manual, the only modification of items in the MBI-ES has been to change the word "recipient" to "student." This was done to insure clarity and consistency in the interpretation of items. In the education profession, students are the educators' recipients. Two large studies substantiated the validity and reliability of the MBI-ES with the changes from the MBI-HSS. Factor analytic studies by Iwanicki and Schwab (1981), with 469 Massachusetts teachers, and by Gold (1984), with 462 California teachers, support the three-factor structure of the MBI-ES. According to Iwanicki and Schwab, the Cronbach alpha estimates for the Emotional Exhaustion, Depersonalization, and Personal Accomplishment domains are .90, .76, and .76 respectively. Gold reports estimates of .88, .74, and .72, respectively for reliability. These reliability coefficients parallel those of the MBI-HSS. Mean scores and standard deviations for teachers indicate higher mean scores on Emotional Exhaustion (teachers mean = 21.25, overall sample mean = 20.99); substantially higher scores on Depersonalization (teachers mean = 11.00, overall sample mean = 8.73); and lower scores on Personal Accomplishment (teachers mean = 33.54, overall sample mean =

34.58). Since the mean scores vary from the overall sample, the cut-off points for classifying teachers are different from other subgroups and from the overall sample. According to the manual the normative sample of educators consists of 4,163 elementary and secondary teachers, grades K-12 (Maslach, Leither, & Jackson, 1996).

Conceptually, burnout is considered a continuous psychological construct that lies along a continuum of experienced feeling, ranging from low to moderate to high degrees. A high degree of burnout is reflected by high scores on both the Emotional Exhaustions and Depersonalization subscales combined with low scores on the Personal Accomplishment subscale. Average scores on all three subscales indicate an average level of burnout. Low scores on the Emotional Exhaustion and Depersonalization subscales as well as high scores on the Personal Accomplishment subscale indicate a low level of burnout (Maslach, Leither, & Jackson, 1996). Raw scores were calculated for the MBI-ES by summing the values for each item in the respective subscales (PA, EE, and DP) (Table 4).

Symptom Checklist-90-Revised (SCL-90-R). The SCL-90-R is a 90-item self-report symptom inventory measuring current psychological symptom status (Derogatis, 1994). Using a five point scale (0 = *not at all* to 4 = *extremely*) participants respond to items indicating “how much discomfort that problem has caused” during a specified period of time (i.e., “past seven days including today”). This task requires 12-15 to complete in its entirety.

Although the SCL-90-R has been found to adequately assess adult psychiatric inpatients and outpatients as well as adult nonpatients and adolescent nonpatients, the current study will utilize the normative standards developed for an adult outpatient sample. The reliability of the SCL-90-R is reported as satisfactory for both internal consistency (internal consistency coefficients ranging from a low of .77 for Psychoticism to a high of .90 for Depression) and test-

retest reliability (coefficients ranging from .80 to .90, which is an appropriate level for measures of symptom construct; Derogatis, 1994). Test-retest reliability is considered adequate with coefficients ranging from .68-.83 (Derogatis, 1994). Convergent-discriminate validity correlations are considered highly acceptable. The SCL-90-R dimensions have highest correlations with comparable constructs on the MMPI, and like dimensions of the Crown-Crisp Experiential Index. The SCL-90-R has well established concurrent validity with a number of comparable measures. The Depression dimension of the scale has high correlations with the Center for Epidemiologic Studies Depression Scale (CES-D) and the Hamilton Rating Scale of Depression (Derogatis, 1994). Its global scores correlate highly with the total scores of the Social Adjustment Scale-Self-Report (SAS-SR). Convergent validity of the SCL-90-R Somatization scale has also been confirmed. The 36 intercorrelations among the nine SCL-90-R scales range from .41 to .74, with an average of .58 (Derogatis, 1994).

Scores on this instrument are obtained on nine factors: Somatization (12 items), Obsessive-Compulsive (10 items), Interpersonal Sensitivity (9 items), Depression (13 items), Anxiety (10 items), Hostility (6 items), Phobic Anxiety (7 items), Paranoid Ideation (6 items) and Psychoticism (10 items). Increasing scores indicate an increase in severity of symptoms on the associated scale. Items for each factor load only on that factor dimension. Three global scores (indices) can be also obtained. The Global Severity Index (GSI) is the average rating given to all 90 items and is considered the best indicator of an overall level of distress (range 0 to 4). The Positive Symptom Total (PST) is the number of symptoms reported (range 0-90). The Positive Symptom Distress Index (PSDI) is the average rating, from 1 to 4, given to those symptoms which are reported (Derogatis, 1994).

Raw scores were calculated for the SCL-90-R by summing the values for the item responses in each of the nine symptom dimensions and the seven additional items. The sum for each symptom dimension was then divided by the number of endorsed items in that dimension. The GSI was computed by summing the scores on the nine symptom dimension and the additional items. This sum was then divided by the total number of responses. The GSI has a range from 0 to 4, where increasing scores indicate a greater severity of overall psychological distress. The PST was derived by counting the number of items endorsed in a positive (nonzero) direction. The PST range is 0-90 with increasing scores indicating an increase in the number of symptoms experienced. The PSDI was calculated by dividing the sum of all item values by the PST, which provides an average for the intensity of the symptoms experienced. The raw scores for the PSDI range from 0-4, where 0 indicates no distress and 4 indicates that each symptom endorsed is experienced at maximum intensity. The raw scores for the nine symptom dimensions and three global indices were converted to standard scores using the norms for adult nonpatients based on gender (Derogatis, 1994). Basic scale and dimension score interpretations for the SCL-90-R are provided in Table 5.

Procedure

On the initial day of the study, participants were given a cover letter stating the purpose of the study and assured respondents that their answers would be confidential. The survey was conducted on a voluntary basis. After recruitment, teachers were given written informed consent for participation. Teachers were asked to complete the demographics questionnaire, SCL-90-R, MBI-ES, and the Teacher Stress Inventory and immediately return them to the researcher. Due to time constraints, all teachers were permitted to take the surveys with them and return them to a drop box located in secure locations in the offices at each school. Teachers participating in the

cortisol sampling were given a package containing 9 microcentrifuge tubes with caps and a log. Teachers were asked to sample saliva for cortisol assessment on 3 consecutive working days. Teachers providing cortisol samples collected the first sample immediately upon waking, 30 minutes after waking, and then immediately before bed. Participants were instructed to place saliva samples in the freezer immediately after collection and transport to home school in cooler with ice packs. Schools were provided with coolers and icepacks to maintain the samples until collection. Furthermore, they were instructed not to brush their teeth until completion of data sampling for the morning samples; this was a necessary precaution to avoid micro-injuries in the oral cavity leading to contamination of the sample with blood. Apart from these restrictions, subjects were instructed to follow their normal morning routines (e.g. physical activities, use of alarm clock). After completing the experimental procedures, teachers returned all materials to their home schools, which were then picked up by the researcher. There was no monetary incentive to participate, however participants returning a signed consent form were entered into a drawing for one of four \$25 gift cards for classroom supplies.

Salivary cortisol collection and analysis.

Saliva samples were taken using microcentrifuge tubes (1.5mL). Each tube was labeled to indicate the sample it contains (i.e. Day 1 Sample 1, Day 1 Sample 2, etc.). Participants were instructed to give saliva samples by tilting their head forward and allowing saliva to collect under the tongue over a period of two minutes. Participants then transferred the saliva to the corresponding microcentrifuge tubes by placing the open end of the tube between the lips, and then guiding the saliva into the open tube with the tongue. They were then instructed to record the exact time the sample was collected and noted the time the next sample was to be collected. To control for the effects of possible cortisol influencing parameters such as smoking, the use of

oral contraceptives, and the use of prescribed medication, information regarding these variables was recorded and included as covariates in subsequent statistical analyses. After enough saliva has been collected to fill the tube at least one half full, the tubes were then sealed with the provided stoppers and stored in participant's freezer for the 3 day period (Salimetrics, LLC, 2010). On the day of transfer for analysis, participants placed all of the samples in the provided Styrofoam cooler with the provided ice packs and transported the samples to his or her home school. The researcher then picked the samples up in the morning on the day of transfer. Samples were transported to the Auburn University Cardioprotection laboratory and stored at -80 degree Celsius until the day of analysis. On the day of analysis, samples were brought to room temperature to be analyzed. Samples were centrifuged (9300 *ref*, 15 minutes, 25°C). Cortisol concentrations measured in nanomoles per liter ($\mu\text{mol/dL}$) in saliva were determined by Salimetrics, LLC high sensitivity salivary cortisol enzyme immunoassay kit as per the manufacturer's instructions (2010). Samples from each subject were run in duplicate in the same assay and an inter-assay average was calculated for each wake sample, 30 minute sample, and end of day sample. Salivary cortisol was expressed in $\mu\text{g/dL}$, the sensitivity was 1 $\mu\text{g/dL}$, and internal and external controls were included in the assays. Good precision was obtained as the mean within-assay coefficients of variation was 1.37, and those between assays never exceeded 5%. All samples from each group were analyzed simultaneously in duplicate. Salivary cortisol levels were compared to the norms provided by the manufacturer as listed in Table 6 and a change score was calculated by subtracting PM cortisol concentration from the highest AM concentration. Eleven of the sixteen teachers (69%) providing saliva samples had morning cortisol levels that were outside of the expected range for age and sex by an average of 55% (SD=65%). Examining PM cortisol levels reveals that six participants (38%) had cortisol levels

that were outside the expected PM ranges for age and sex by an even more alarming, 215%. (SD=195%). These numbers were highly influenced by the small number of participants in the sample (Table 7). Due to cost restrictions, all participants were included in the salivary cortisol analysis, even considering cortisol outside of normal ranges for morning cortisol awake response.

A ready-to-use, 96-well microtitre plate precoated with monoclonal anti-cortisol antibodies was utilized in this analysis. Six vials, 500 μ L each, containing cortisol concentrations of 3.0, 1.0, 0.333, 0.111, 0.037, and 0.012 μ g/dL, in a synthetic saliva matrix with a non-mercury preservative. Values in nmol/L are 82.77, 27.59, 9.19, 3.06, 1.02, and 0.33 respectively. Standards are traceable to the National Institute of Standards and Technology (NIST) standard. Two controls representing high and low levels of salivary cortisol in a saliva-like matrix with a non-mercury preservative were utilized for further reference points. For the necessary wash buffer, a 100 mL of a 10X phosphate buffered solution containing detergents and a non-mercury preservative was used. The buffer concentrate was diluted 10-fold with room temperature deionized water (100 mL of 10X wash buffer to 900 mL of deionized H₂O). The Assay Diluent was comprised of 60 mL of a phosphate buffered solution containing a pH indicator and a non-mercury preservative. The Enzyme Conjugate was comprised of 50 μ L of a solution of cortisol labeled with horseradish peroxidase and was diluted prior to use with assay diluent. Tetramethylbenzidine (TMB) was used as the visualizing reagent for analysis in the plate reader. The stop solution consisted of sulfuric acid.

All reagents and samples were brought to room temperature. Plate layouts were established to include all controls, standards, and samples to be run in duplicate. Each plate contained all nine samples (3 samples per day over 3 days) from four participants. Twenty-five

25 μL of standards, controls, and unknowns were measured into appropriate wells along with 25 μL of assay diluent into 2 wells to serve as the zero value. A 1:1600 dilution of conjugate was made by adding 15 μL of the conjugate to the 24 mL of assay diluent. The diluted conjugate was immediately mixed and 200 μL was measured into each well using a multichannel pipette. Plates were then mixed on rotator for 5 minutes at 500 rpm and incubated at room temperature for an additional 55 minutes. Plates were washed 4 times with 1X wash buffer. After each wash, the plate was thoroughly blotted on paper towels before being turned upright. Next, 200 μL of TMB solution was added to each well with a pipette. The plates were mixed on a plate rotator for 5 minutes at 500 rpm and incubated in the dark at room temperature for an additional 25 minutes. Then, 50 μL of stop solution was added to each well with a pipette. The plates were mixed at 100 rpm for 1 minute on a plate rotator. The bottom of each plate was wiped off with a water-moistened, lint-free cloth and wiped dry. The plates were then read in a plate reader at 450 nm. Plates were read within 10 minutes of adding stop solution

CHAPTER IV

RESULTS

Hypothesis 1:

Special education teachers will have significantly greater psychological distress as indicated by scores on the SCL-90-R and the Teacher Stress Inventory, than will general education teachers.

In order to examine the effect of job category (general vs. special education) and participant sex on teacher burnout scores, independent of fluctuations in participants' level of anxiety and depression, a MANCOVA was run across the three levels of burnout (personal accomplishment, depersonalization, emotional exhaustion), with job (special education, general education) and participant sex (male, female) as the independent variables and participants' levels of anxiety and depression as covariates in the model. Importantly, neither participants' level of depression nor their levels of anxiety were significant covariates for any of the dimensions of burnout (all p s > .18), which helped to differentiate burnout from symptoms of depression and anxiety. The analysis yielded a main effect of participant sex for the dimension of emotional exhaustion $F(1,157)=5.12, p=.03$, indicating that men reported higher levels of emotional exhaustion ($M=25.12, SD=7.81$) than did women ($M=21.32, SD=8.94$). Furthermore, there was an interaction between participant sex and job status across the dimension of personal accomplishment, $F(1,157)=4.22, p=.04$. To better understand this effect, a separate independent samples t-test was run comparing men and women's personal accomplishment scores separately for special education and general education instructors. Although male ($M=30.80, SD=5.80$) and female ($M=28.13, SD=7.18$) special education instructors did not differ in levels of personal

accomplishment, $t(60)=1.31, p=.20$, female general education instructors ($M=30.24, SD=6.93$) reported marginally lower levels of personal accomplishment than did their male counterparts ($M=27.50, SD=6.99$), $t(99)=-1.87, p=.06$.

To assess occupational distress as measured by the Teacher Stress Inventory, a 2 participant sex (male, female) x 2 job status (special education, general education) between subjects ANOVA was run across participants' total score on the Teacher Stress Inventory. This analysis yielded no main effect of participant sex, nor an interaction between participant sex and job status ($p>.17$). There was also no main effect of job status, $F(1,159)=3.07, p=.08$.

To assess psychological distress as indicated by the SCL-90-R, a 2 participant sex (male, female) x 2 job status (special education, general education) MANOVA was run across three subscales of the SCL-90-R (GSI, PSDI, PST). This analysis yielded no main effects of job status across the three domains of the SCL-90-R, nor were there any interactions between participant sex and job status (all $ps>.43$). However, there was a significant main effect of participant sex for the GSI, $F(1,159)=12.92, p<.01$, and PSDI, $F(1,159)=5.76, p=.02$; there was also a marginal main effect of participant sex for the PST, $F(1,159)=2.95, p=.09$. For the GSI, men ($M=61.35, SD=3.59$) indicated higher scores than did women ($M=59.22, SD=3.28$), meaning men report experiencing a greater level of overall psychological distress. For the PSDI, men ($M=59.08, SD=8.42$) indicated higher scores than did women ($M=56.02, SD=7.82$). The PSDI indicates the severity of the symptoms endorsed, meaning men endorsed symptoms as more intense than women, even though they may have endorsed fewer overall symptoms as indicated by the PST. For the PST, women ($M=57.88, SD=4.69$) indicated marginally higher scores than did men ($M=56.43, SD=4.97$), meaning women endorsed more symptoms but with less severity.

According to the SCL-90-R, when using a non-clinical comparison sample (as is the case for teachers), any t-scores above 50 on all scales indicated clinically significant elevations in psychological distress as measured by the individual scale. A one sample t-test was used with a test value of 50 to examine statistically significant elevations on the SCL-90-R. When looking at this sample, it is important to note that there were significant elevations on all subscales and all index scores. These results indicate that the teachers are reporting statistically significant elevations of psychological distress above what would be expected in a non-clinical sample (Table 8). Like the SCL-90-R, the TSI uses cut-off scores to categorize differing amounts of occupational stress. The TSI utilizes a set of decile ranges to categorize stress levels in teachers, with any elevations at or above the 50-59th decile indicative of significantly elevated occupational stress. Teachers in this study endorsed clinically significant levels of teacher stress across all subscales (Table 9). Finally, teachers in this study indicated significant differences from the normative sample on the MBI-ES, specifically the DP and PA domains (Table 10).

Hypothesis 2:

Psychological distress, as indicated by scores on the SCL-90-R and Teacher Stress Inventory, will be positively correlated with burnout scores in general education and special education teachers.

Correlations were run comparing participants' total score on the TSI with their scores on each subscale of the MBI-ES (Table 11). In only one case was participants' TSI total score correlated with the MBI. Specifically, TSI total scores were negatively correlated with MBI Depersonalization scores, $r(161) = -.283, p < .01$, indicating that as participants indicated higher stress as indexed by the TSI, they reported lower levels of burnout depersonalization. This relationship runs contrary to what would be expected because high scores on the

depersonalization subscale should be positively correlated with scores on TSI as they both measure related constructs of psychological distress. Significant correlations with TSI subscales are listed in Table 11. Most notably are the negative correlations with the DP subscale from the MBI-ES and the Cardiovascular, Gastronomical, and Behavioral Manifestation subscales.

Correlations comparing the three burnout subscale scores (PA, DP, EE) for each participant with the three scores for the SCL-90 (GSI, PSDI, PST) indicate that scores on the GSI subscale were significantly positively correlated with burnout depersonalization scores, $r(161)=.15, p=.05$, indicating that higher levels of overall psychological distress were associated with higher levels of depersonalization. Scores on the PSDI were not significantly correlated with any of the burnout subscale scores (all $ps>.12$). Scores on the PST were not significantly correlated with any of the burnout subscale scores (all $ps>.19$).

Hypothesis 3:

The difference between morning and evening cortisol levels will be positively correlated with burnout in general education and special education teachers.

Individuals PM cortisol average was subtracted from the AM cortisol average to get a cortisol change score, where higher values indicate greater reductions in cortisol from the beginning of the day to the end. This difference was correlated with the PA, DP, and EE subscales on the MBI-ES. Due to the small sample size ($N=16$) from which cortisol readings were obtained, these analyses were low power and thus, none of the correlations reached conventional significance using difference scores. However, there was a trend for cortisol difference score to be positively correlated with the PA domain on the MBI-ES, $r(14)=.29, p=.27$, and negatively correlated with the depersonalization dimension of burnout, $r(14)=-.32, p=.22$ (the p value of these correlations drops to .18 and .17, respectively, when the initial

cortisol reading is used instead of the average of the waking and post thirty minute readings). However, when correlations are run separately for special education teachers and general education teachers, an interesting pattern emerges. Although cortisol levels are unrelated to self reported burnout in the general education sample (all p 's > .53), cortisol levels are positively related to the personal accomplishment subscale (interpreted in the opposite direction from EE and DP subscales, meaning lower scores indicate a greater sense of personal accomplishment) of the MBI-ES for special education instructors, $r(6) = -.70$, $p = .055$.

Hypothesis 4:

The difference between morning and evening cortisol levels will be positively correlated with psychological distress as indicated by scores on the SCL-90-R and Teacher Stress Inventory.

Individuals' PM cortisol average was subtracted from the AM cortisol average to get a cortisol change score, where higher values indicate greater reductions in cortisol from the beginning of the day to the end, an indication of prolonged exposure to stress. This difference was correlated with the Teacher Stress Inventory Total and Subscales. The cortisol change score was significantly negatively correlated with the TSI total score, $r(16) = -.566$, $p = .02$. This means that the larger the change in cortisol from AM to PM the total stress score on the TSI decreases, something not expected based on the cortisol literature. The cortisol change score was significantly positively correlated with the Fatigue Manifestation Subscale on the TSI, $r(16) = .537$, $p = .032$, meaning that the larger the change score the higher the score on the Fatigue Manifestation Subscale. This supports previous research that indicates that the greater the drop between morning and evening cortisol levels the more exposure to stress (Pruessner, Hellhammer, & Kirschbaum, 1999) and may the Fatigue Manifestation Subscale might be a

better predictor of physiological stress than the TSI total score. When examining the general education teachers apart from special education teachers, the negative relationship between the change score and the TSI total becomes even more apparent, $r(8)=-.725, p=.042$. This same negative correlation can be seen on the Fatigue Manifestations Subscale in relation to the cortisol change in general education teachers, $r(8)=-.838, p=.009$. The larger the decrease in salivary cortisol levels throughout the day, the higher the scores on the Fatigue Manifestations subscale from the TSI, indicating that this particular subscale may be a useful indicator for predicting the physiological stress response and is particularly sensitive to special education teachers. Correlation analysis between subscales on the SCL-90-R and the cortisol change score did not yield any significant results.

Exploratory Findings

Other significant and interesting findings uncovered through analysis of other variables are as follows. Job satisfaction was negatively correlated with the Depersonalization Subscale of the MBI-ES, $r(161)=-.184, p=.019$, and also negatively correlated with the GSI on the SCL-90-R, $r(163)=-.195, p=.013$. These results indicated that as teachers are more satisfied with their jobs, they are less likely to report increased levels of overall generalized stress and job depersonalization.

Gross annual salary was positively correlated with overall teacher related occupational stress as measured by the Teacher Stress Inventory's overall stress scale, $r(159)=.162, p=.041$, and also with number of years teaching, $r(159)=.821, p<.001$. Interestingly, when examining special education teachers separately, there was a significant inverse relationship between years teaching and GSI scores, $r(62)=-.265, p=.037$. This indicates that the longer a special education teacher is in the profession, the less likely he or she is to experience general symptoms of

psychological distress. However, there was also a significant positive relationship between years teaching for special education teachers and occupational related stressors as indicated by the total score on the TSI, $r(62)=.339, p=.007$. As special education teachers are in the field longer, they indicate increased occupational related stressors but diminished overall general psychological distress. A summary of these correlations can be seen in Table 13.

Tables

Table 1

Special Education Teacher Demographic Variable Frequency

Variable	Descriptor	N	Percent
Sex	Male	15	24.2
	Female	47	75.8
# of Different Grades Taught	One	9	14.5
	Two	36	58.1
	Three	17	27.4
Race/Ethnicity	White	42	67.7
	Black	14	22.6
	Asian	3	4.8
	Hispanic	1	1.6
	Other	2	3.2
Education/Degree	Bachelor's Non-Education & Edu. Related	1	1.6
	Bachelor's in Edu. ONLY	1	1.6
	Bachelor's in Non-Education And Master's In Edu.	32	51.6
	Bachelor's & Master's In Edu.	28	45.2
Certification	birth through third grade	13	21.0
	K through sixth grade	40	64.5
	birth through sixth grade	9	14.5
Tobacco Use	Yes	9	14.5
	No	53	85.5
Medication Use	Yes	28	45.2
	No	34	54.8
Salary Range	\$25-30k	1	1.6
	\$30-35k	6	9.7
	\$35-40k	14	22.6
	\$40-45k	25	40.3
	\$45-50k	9	14.5
	\$50-55k	7	11.3

Table 2

General Education Teacher Demographic Variable Frequency

Variable	Descriptor	N	Percent
Sex	Male	34	33.7
	Female	67	66.3
Race/Ethnicity	White	58	57.4
	Black	28	27.7
	Asian	6	5.9
	Hispanic	5	5.0
	Other	4	4.0
Grade Taught	Kindergarten	15	14.9
	First	10	9.9
	Second	14	13.9
	Third	16	15.8
	Fourth	18	17.8
	Fifth	16	15.8
	Sixth	12	11.9
Education/Degree	Bachelor's Non-Education & Edu. Related	22	21.8
	Bachelor's in Edu. ONLY	25	24.8
	Bachelor's in Non-Education And Master's In Edu.	29	28.7
	Bachelor's & Master's In Edu.	25	24.8
Certification	Preschool-Grade 3	23	22.8
	Kindergarten-Grade 6	69	68.3
	Preschool-Grade 6	9	8.9
Tobacco Use	Yes	15	14.9
	No	86	85.1
Medication Use	Yes	52	51.5
	No	49	48.5
Salary Range	\$25-30k	1	1.0
	\$30-35k	7	6.9
	\$35-40k	24	23.8
	\$40-45k	24	23.8
	\$45-50k	20	19.8
	\$50-55k	12	11.9
	\$55-60k	9	8.9

Table 3

Teacher Stress Inventory Score Mean, Standard Deviations, Ranges, and Reliabilities

Scale and Subscale Variables	Item N	Norm M	Norm SD	Scale Range	Scale α	Teacher M	Teacher SD	Teacher Range	Teacher α
Stress Sources									
Time Management	8	3.2	.8	2.13	.83	3.37	0.44	2.13-4.25	.77
Work Related	6	3.1	.9	2.00	.80	3.57	0.37	2.67-4.5	.69
Professional Distress	5	3.1	1.1	2.80	.82	3.56	0.45	2.8-4.4	.74
Discipline and Motivation	6	2.9	1.1	2.17	.86	3.52	0.42	2.5-4.5	.88
Professional Investment	4	2.7	1.0	2.75	.75	3.56	0.49	2.75-4.5	.65
Stress Manifestations									
Emotional Manifestations	5	2.6	1.0	2.40	.87	3.38	0.46	2.0-4.4	.80
Fatigue Manifestations	5	2.5	1.0	2.40	.82	3.43	0.54	2.0-4.4	.76
Cardiovascular Manifestations	3	1.9	1.0	3.33	.78	3.37	0.63	2.0-4.67	.73
Gastronomic Manifestations	3	1.8	1.1	4.00	.88	3.53	0.59	2.33-5.0	.81
Behavioral Manifestations	4	1.5	.8	3.00	.82	3.43	0.60	1.75-4.6	.74
Total Stress Strength									
Total Stress	49	2.6	.7	1.50	.93	3.47	0.27	3.09-4.1	.83

Table 4

Maslach Burnout Inventory-Educators Survey Score Means, Standard Deviations, Ranges, and Reliabilities

Domain	Item N	Norm M	Norm SD	Scale Range	α	Teacher M	Teacher SD	Teacher Range	Teacher α
Depersonalization	17	21.25	11.01	0-102	.74	29.11	6.97	3-78	.56
Emotional Exhaustion	13	33.54	6.89	0-78	.88	18.98	9.05	4-42	.33
Personal Accomplishment	14	11.00	6.19	0-84	.72	22.47	8.77	12-44	.64

Table 5

Symptom Check List-90-Revised Scale T-Score Means, Standard Deviations, Ranges and Reliabilities

SCL-90-R	Item N	Norm M	Norm SD	Scale Range	Norm α	Teacher M	Teacher SD	Teacher Range	Teacher α
Indices									
Global Severity Index	90	53	18	30-80	NA	59.86	3.50	37-76	NA
Positive Symptom Total	90	52	10	30-80	NA	57.44	4.80	39-74	NA
Positive Symptom Distress Index	90	52	14	37-80	NA	56.94	8.10	42-76	NA
Factors									
Somatization	12	54	18	35-80	.88	57.80	7.80	39-71	.65
Obsessive-Compulsive	10	53	19	37-80	.87	58.20	9.06	38-75	.72
Interpersonal Sensitivity	9	53	16	39-80	.86	60.02	8.86	42-75	.53
Depression	12	55	20	34-80	.90	60.23	8.90	41-75	.69
Anxiety	10	53	18	36-80	.88	59.99	9.07	42-76	.65
Hostility	6	52	16	40-80	.85	58.44	8.76	42-75	.77
Phobic Anxiety	7	56	12	44-80	.89	59.33	8.96	44-74	.71
Paranoid Ideation	6	53	15	42-80	.80	59.59	9.41	42-75	.54
Psychoticism	10	55	15	44-80	.80	52.23	4.54	44-73	.56

Table 6

Salivary Cortisol Expected Ranges (Salimetrics, 2010)

Group	Expected AM Range ($\mu\text{g/dL}$)	Expected PM Range ($\mu\text{g/dL}$)
Adult males, ages 21-30	0.112-0.743	ND-0.308
Adult females, ages 21-30	0.272-1.348	ND-0.359
Adult males, ages 31-50	0.122-1.551	ND-0.359
Adult females, ages 31-50	0.094-1.515	ND-0.181
Adult females, ages 51-70	0.149-0.739	0.022-0.254

ND= None Detected ($<.004 \mu\text{g/dL}$)

Table 7

Salivary Cortisol Descriptives by Reference Group

Group	N	AM Mean ($\mu\text{g/dL}$)	AM SD	Sample AM Range ($\mu\text{g/dL}$)	PM Mean ($\mu\text{g/dL}$)	PM SD	Sample PM Range ($\mu\text{g/dL}$)
Males, ages 21-30	3	1.66	.24	1.06-2.04	.28	.28	ND-.66
Females, ages 21-30	2	1.9	.42	1.36-2.71	.14	.30	ND-.75
Males, ages 31-50	3	1.55	.33	.85-2.11	.07	.10	ND-.25
Females, ages 31-50	7	1.45	.43	ND-2.03	.31	.53	ND-1.90
Females, ages 51-70	1	1.50	.17	.93-2.02	1.51	.41	1.35-1.69

ND=None Detected (<.004 $\mu\text{g/dL}$)

Table 8

Symptom Check List-90-Revised Clinically Significant Elevations

Scale/Index	M	SD	t	Sig (2-tail) ^b	Mean Difference
Somatization	57.80	7.80	12.77	.000 ^a	7.80
Obsessive-Compulsive	58.20	9.06	11.56	.000 ^a	8.20
Interpersonal Sensitivity	60.02	8.86	14.45	.000 ^a	10.02
Depression	60.23	8.90	14.68	.000 ^a	10.23
Anxiety	59.99	9.07	14.07	.000 ^a	9.99
Hostility	58.44	8.76	12.29	.000 ^a	8.44
Phobic Anxiety	59.33	8.96	13.29	.000 ^a	9.33
Paranoia	59.59	9.41	13.01	.000 ^a	9.59
Psychoticism	52.23	4.537	6.27	.000 ^a	2.22
Global Severity Index	59.86	3.50	35.93	.000 ^a	9.86
Positive Symptom Distress Index	56.94	8.10	10.93	.000 ^a	6.94
Positive Symptom Total	57.41	4.81	19.77	.000 ^a	7.44

^a=p<.001^b=Based on Derogatis (1994) cutoff for clinical significance (50T)

Table 9

Teacher Stress Inventory Clinically Significant Elevations

Scale	Teacher M	SD	t	Sig (2-tailed) ^b	Mean Difference
Time Management	3.37	.44	3.57	.000 ^a	.123
Work Related Stress	3.57	.37	16.1	.000 ^a	.462
Professional Distress	3.56	.45	17.0	.000 ^a	.600
Discipline & Motivation	3.52	.42	15.8	.000 ^a	.518
Professional Investment	3.56	.49	21.1	.000 ^a	.811
Emotional Manifestations	3.38	.46	21.7	.000 ^a	.777
Fatigue Manifestations	3.43	.54	24.1	.000 ^a	1.02
Cardiovascular Manifestations	3.37	.63	34.7	.000 ^a	1.70
Gastronomical Manifestations	3.53	.59	47.7	.000 ^a	2.20
Behavioral Manifestations	3.43	.60	50.3	.000 ^a	2.38
TSI Total	3.47	.27	46.6	.000 ^a	.976

^a=p<.001^b=Based on Fimian (1988) cutoff for significant level of occupational stress (50-59th Percentile)

Table 10

Maslach Burnout Inventory-Educators Survey Clinically Significance Elevations

Subscale	Norm M	Sample M	SD	t	Sig. (2-tailed)	Mean Difference
Depersonalization	11	18.98	9.052	11.26	.000 ^a	7.98
Emotional Exhaustion	21.3	22.47	8.769	1.77	.078 ^b	1.216
Personal Accomplishment	33.5	29.11	6.974	-8.12	.000 ^a	-4.43

^a=p<.001^b=p>.05, Not Significant

Table 11

Correlations for Teacher Stress Inventory and Maslach Burnout Inventory-Educators Survey

Scale or Subscale	Personal Accomplishment	Depersonalization	Emotional Exhaustion
Time Management	.059	-.045	-.005
Work Related Stress	-.099	-.022	.010
Professional Distress	-.041	-.027	-.015
Discipline/Motivation	.037	-.228 ^a	.050
Professional Involvement	-.244 ^a	-.071	.017
Emotional Manifestation	.078	-.098	.088
Fatigue Manifestation	-.009	-.064	-.177 ^b
Cardiovascular Manifestations	.041	-.164 ^b	.072
Gastronomical Manifestation	-.046	-.244 ^a	.033
Behavioral Manifestations	.054	-.433 ^a	.100
TSI Total	-.027	-.283 ^b	.035

^a. Correlation is significant at the 0.01 level (2-tailed)

^b. Correlation is significant at the 0.05 level (2-tailed).

Table 12

Correlations for Maslach Burnout Inventory-Educators Survey and Symptom Check List-90-Revised

Domain/Scale	Personal Accomplishment	Depersonalization	Emotional Exhaustion
Somatization	-.072	.011	-.001
Obsessive-Compulsive	-.023	-.041	-.015
Interpersonal Sensitivity	.116	-.068	.127
Depression	-.118	.062	.066
Anxiety	-.041	.034	-.025
Hostility	.097	-.057	.095
Phobic Anxiety	.126	-.094	.007
Paranoia	-.082	.136	.067
Psychoticism	-.092	.063	.052
Global Severity Index	-.088	.151 ^a	.078
Positive Symptom Distress Index	-.074	.074	.122
Positive Symptom Total	-.020	.037	-.103

^ap<.05

Table 13

Significant Cortisol Correlations: Special vs. General Education

Job Classification	Variable	AM Cortisol	PM Cortisol	Daily Cortisol Change
Special Education Teacher				
	Age	-.507	.536	-.578
	Years Teaching	-.447	.564	-.584
	Came to Work Sick	-.622	.590	-.653
	Gross Annual Salary	-.027	.222	-.190
	Fatigue Manifestations	.198	.069	-.005
	TSI Total	-.077	.366	-.323
	Hostility (SCL-90-R)	.655	-.688	.742 ^a
General Education Teachers				
	Age	-.695	.547	-.784 ^a
	Years Teaching	-.666	.450	-.688
	Came to Work Sick	-.500	.460	-.621
	Gross Annual Salary	-.598	.564	-.754 ^a
	Fatigue Manifestations	-.683	.616	-.838 ^b
	TSI Total	-.763 ^a	.441	-.725 ^a
	Hostility (SCL-90-R)	.503	-.341	.521

^a Correlation is significant at the 0.05 level (2-tailed)

^b Correlation is significant at the 0.01 level (2-tailed)

CHAPTER V

DISCUSSION

This study was different than many other studies because it examined a relationship between a more objective measure of stress (salivary cortisol) and the subjective, self report measures that are often utilized in research concerning teachers. There were very few differences of significance between special education and general education teachers across measures. This is an important finding as it may indicate that for teachers in these schools, the gap in stress, burnout, and attrition between general and special education teachers may be much less than is indicated in the literature. It is possible that the trend for special education teachers to leave the field is beginning to reverse, but it is more likely that the lack of significant findings is more a result of methodological issues with this study. Of particular note, teachers were sampled near the end of the school year, which may potentially lead to an artificially deflated experience of burnout while leading to an inflation of symptoms associated with job stress.

The effect of burnout in relation to salivary cortisol levels has yielded mixed results and failed to provide convincing evidence for HPA-axis dysregulation in burnout: significantly blunted cortisol levels or significantly elevated cortisol levels and even comparable cortisol levels by utilizing high burnout groups. It remains unclear whether these inconsistent findings may be ascribed to methodological issues regarding cortisol measurement protocols and burnout assessment or whether specific burnout stages with stage-specific HPA-axis dysregulations exist. These results do not imply that the teachers are “healthy”, since high levels of psychological distress and occupational related stress were observed. It may be that burnout symptoms do not

necessarily reflect stress-related health consequences as was first predicted. Rather, burnout symptoms may be a better reflection of the cognitive stress responses, such as is measured by the depersonalization subscale. Burnout symptoms, in fact, may be regarded as preliminary stages of stress-related health consequences. Health consequences reflected by dysregulation of HPA-axis functioning (as in major depression, fatigue, or cardiovascular problems to name several) appear at later stages. However, prospective long-term studies are needed to support these presumptions and to delineate the pathway from emotional stress responses, such as burnout, to serious health consequences.

Unlike various burnout studies carried out in the laboratory under controlled conditions, the present study was carried out in a natural context, using data collected from teachers actively engaged in their work. For this reason, the study cannot deliver “cause or effect analyses” to describe the complex relationships between the different variables investigated. Interesting results have been found using MBI-ES cutoff scores to differentiate groups, and the selection of extreme groups was predicted to help clarify the psychophysiological responses characteristic of burnout teachers. The subsample of teachers selected for saliva collection was too small to reach significant power, however as noted, some trends were identified.

The first hypothesis was not fully supported by the current study. In fact, general education teachers showed a marginally higher level of psychological distress than did special education teachers. These findings are not consistent with the literature and might be related to the fact that many of the teachers in this study were surveyed near the end of the school year and only several weeks after state mandated testing. As was indicated in the literature, burnout is thought to develop as a result of chronic stress over time. Due to the increase in situational stress, especially on the general education teachers, the results of this study might be more

reflective of the impact of temporary stressors rather than the long term stress associated with the development of burnout.

The second hypothesis was not fully supported. As is indicated in the literature on burnout, typically when the level of personal accomplishment had decreased, emotional exhaustion and depersonalization significantly increased, the present study did not yield similar results. Teachers reported higher levels of depersonalization independent of the emotional exhaustion and personal accomplishment scores. The reliability coefficient ($\alpha=.33$) for the EE subscale on the MBI-ES based on the responses from the teachers in this study indicates that results need to be interpreted with caution (See Table 3). Scores on the EE subscale are less reliable than has been demonstrated in the literature. The results of this study raise the possibility that there may be certain situational or environmental factors that influenced teachers self-report of burnout symptoms.

Results utilizing salivary cortisol levels in statistical analysis should be interpreted with caution. Due to the small number of participants in the cortisol subsample, results did not reach traditional statistical significance, therefore making any conclusive interpretations of hypotheses three and four premature. Results did not indicate any significant differences between general education and special education teachers in relation to the change in cortisol levels over the course of the day. As was indicated, the EE domain of the MBI-ES, which traditionally has been shown to be the most sensitive to the physiological effects of burnout, did not follow the same trends in this study. The reliability of the EE domain for this particular sample indicates that any conclusions be interpreted cautiously, as it is not consistent with the literature on the development of the MBI-ES. However, the other two scales (DP and PA) had good reliability in

the current sample, yet did not indicate any relationship to the difference between AM and PM salivary cortisol concentrations.

The fourth hypothesis was partially supported in that the greater the drop in cortisol over the course of the day (recovery response) was negatively correlated with the work related stressor total score on the TSI. This is consistent with the idea that the decrease in cortisol concentrations over the course of the day determined by the difference between the highest concentration in the morning and the measure at the end of the day would be an indication of elevated levels of stress, although the issue of low statistical power comes into play again taking into consideration such a small sample. This is a significant finding because it indicates that perhaps the recovery response of cortisol over the course of the day is more sensitive to daily occupational stressors rather than a more chronically developing problem like burnout.

Limitations and Directions for Future Research

Future research could include an examination of coping mechanisms. A replication of the current study with larger numbers and an examination of coping mechanisms teachers may use to address stress may highlight differences found within burnout scores. Additional variables should be included in the statistical analysis. Demographic variables such as gender, age, education, and length of teacher experience may play a role in the relationship between teacher stress and burnout. However, classroom or school characteristics such as class size, ethnic composition of the student body, and rural or urban school districts may be important to understand teacher stress. Therefore, it is recommended that future research incorporate these contextual variables to better understand their impact on stress and burnout.

Future research should also include a longitudinal component. The current study was cross-sectional in nature. Past literature has shown that there may be an important temporal

aspect to the relationship between stress and burnout such that as stress builds, burnout is more likely to occur (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). In a cross-sectional study, the temporal relationship between teacher stress and burnout cannot be studied. The measurement of teacher stress at one point in time could be related to teacher burnout at a later point in time, and this possibility could be examined in a longitudinal study. A similar study should be replicated in school districts with differing characteristics. This study was conducted in school districts in relatively rural south eastern Alabama. The extent to which the results from the study generalize to other geographical areas is not known. There may be idiosyncrasies about the Eastern Alabama area or rural school districts that would not generalize to other areas of the country

Two variables not investigated in the current study and nor in given much attention in the current body of literature that would be a valuable asset to understanding the physiological impact that stress has on the body is teacher height and weight. Height and weight could be utilized to determine body mass index (BMI), which could be then compared to published BMI norms (Roberts, Troop, Connan, Treasure, & Campbell, 2007). Future research could also consider utilizing extreme group comparison, specifically comparing high burnout to low burnout scorers on the MBI-ES in relation to salivary cortisol concentrations. The utilization of extreme groups may introduce a certain amount of bias in terms of the selection of participants to the cortisol sampling group, but this allowed for a more robust test of the hypotheses design might help to clarify the relationship between the psychological and physiological manifestations of the stress response.

There was not a consistent pattern that developed in terms of the dysregulation of the HPA-axis in burnout. The absence of significant correlations between symptom severity as

indicated by MBI-ES and cortisol levels, adds to the solidity of the conclusion that the HPA-axis is not as sensitive to burnout, but may have a more pronounced connection in relation to specific job related stressors as measured by TSI. The results of this study do not entirely refute the role of the HPA-axis in the long-term effects of stress, but if there is a connection, the relationship much more complex than initially thought. It is possible that the approach of just taking saliva samples is not sensitive enough to reveal subtle dysregulations in the HPA-axis. Although there is evidence that work stress often precedes the development of burnout, it has been shown that it does not necessarily result in burnout, which is a possible explanation for the high levels of psychological and work related stress in the teachers in this study, but no significant relationship to burnout.

The measurement and analysis of the saliva samples indicate that the majority of teachers in this study had cortisol levels that were outside of the normal range, both for the cortisol awake response (CAR) and overall drop in cortisol over the course of the day. Although this was not found to be related to the burnout measure in this study, it is likely that this is a result of the psychometric properties of the measures rather than the lack of relationship between the experience of burnout and the hypothalamic pituitary axis (HPA). Utilizing different self-report measures may distinguish the difference between burnout, job stress, and the role of the stress hormone cortisol.

Overall, while the immediate aims of the study were not supported, the results indicate that although teachers may not be “burned out,” they are experiencing significant levels of psychological and occupational distress. The high rate of teacher attrition, both general and special education, is an increasingly growing problem. Psychological, occupational, and physiological stress all play a role in teachers leaving the profession, however the degree to

which each impacts teachers remains uncertain. Further research into clarifying the roles of each will serve to better understand the demands place on teachers and ultimately help to reduce the current rate of attrition.

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Appendices

Appendix A

Email to School Superintendents

Dear [Superintendent Name]

My name is Matthew Sacco and I am a doctoral candidate in Counseling Psychology at Auburn University. I was given your contact information by Dr. Cynthia Reed from the Truman Pierce Institute at Auburn University as a person that might be able to provide assistance for a project that I am proposing. I am conducting research as part of my dissertation and am requesting your assistance. My proposed study has been approved by my doctoral committee and will go to the Institutional Review Board (IRB) at the end of this month. The project I am proposing entitled, "The Psychophysiological Impact of Burnout in Special and Regular Education Teachers," will examine the relationship between salivary cortisol levels and several subjective measures of teacher stress. The results of this study will help establish a more objective way to analyze the impact of stress on teachers. In order to be able to obtain IRB permission to move forward with this study, I am requesting your help and permission to sample elementary and middle school teachers within your district. The time commitment to complete a series of self-report measures is minimal for most teachers (30-45 minutes). A second and smaller group of teachers will be asked to complete the same questionnaires and then to provide saliva samples, which they will collect at home. In order to elicit maximum participation from the teachers, each one volunteering to participate will be entered into a raffle for one of four \$25 baskets filled classroom supplies. Also, I will provide a one-hour workshop for the teachers from each school on understanding and managing stress. If you are willing to assist me in getting this project completed I would greatly appreciate it. I can provide other details as needed. In order to receive preliminary IRB approval, I need a signed letter from you on school letter head granting me permission to sample teachers in your district. Attached to this email is a sample letter that contains the required information for IRB approval. If you would be willing and able to fill in the blanks and put in on letter head and mail a copy to me (or scan and attach to email) I would greatly appreciate it.

My contact information is:

Matthew Sacco

Street Address

City, State Zip

My phone number is XXX-XXX-XXX.

I appreciate your consideration in the manner and look forward to working with you in the future.

Thank you,
Matthew Sacco, MS

Appendix B

Email to School Principals

Dear [Principal Name]

My name is Matthew Sacco and I am a doctoral candidate in Counseling Psychology at Auburn University. I was given permission to contact you by [Superintendent Name] to ask for your assistance for a project that I am proposing for my dissertation. My proposed study has been approved by my doctoral committee and will go to the Institutional Review Board (IRB) at the end of this month. The project I am proposing entitled, "The Psychophysiological Impact of Burnout in Special and Regular Education Teachers," will examine the relationship between salivary cortisol levels and several subjective measures of teacher stress. The results of this study will help establish a more objective way to analyze the impact of stress on teachers. In order to be able to obtain IRB permission to move forward with this study, I am requesting your help and permission to sample the teachers at your school. The time commitment to complete a series of self-report measures is minimal for most teachers (30-45 minutes). A second and smaller group of teachers will be asked to complete the same questionnaires and then to provide saliva samples, which they will collect at home. In order to elicit maximum participation from the teachers, each one volunteering to participate will be entered into a raffle for one of four \$25 baskets filled classroom supplies. Also, I will provide a one-hour workshop for the teachers at your school on understanding and managing stress. If you are willing to assist me in getting this project completed I would greatly appreciate it. I can provide other details as needed. .

My contact information is:

Matthew Sacco

Street Address

City, State Zip

My phone number is XXX-XXX-XXX.

I appreciate your consideration in the manner and look forward to working with you in the future.

Thank you,

Matthew Sacco, MS

Appendix C

Demographic Information Sheet

Please answer the following questions to the best of your knowledge

Age_____ Sex_____

Race/Ethnicity:

- _____ Caucasian
- _____ African American
- _____ Asian American
- _____ Hispanic American
- _____ Other: _____

What is your highest level of education attained?

- _____ Bachelor's Degree
- _____ Master's Degree
- _____ PhD

Please list your degrees (i.e., BS Elementary Education, M.Ed Special Education)

What is your primary job classification in your school?

- General Education Teacher OR Special Education Teacher

How many years have you been a full-time teacher?_____

How many years have you been a special education teacher?_____

What specific area(s) are you actively certified to teach? (i.e. K-3, B-3, etc.)

What grade(s) do you teach?

How many different grade levels do you teach at one time (special education)

Do you use tobacco products?_____ (important for saliva sampling)

Not including oral contraceptives, are you currently taking any medications? YES NO

To what extent have you been affected by budget cuts in the last three years?

- 1 – not at all 2 – slightly 3 – somewhat 4 – very much 5 – extremely

In the past school year, how many days have you missed work due to an illness?_____

In the past school year, how many days have you attended work when you were sick? _____

Approximately what percentage of your time do you spend teaching students with special needs in an environment other than the general education classroom (i.e. resource, self-contained or other pull-out setting)? (0-100%)

Approximately what percentage of your time do you spend in a regular education classroom (0-100%)?

Approximately what percentage of your time do you spend teaching students with special needs in a collaborative setting (i.e. co-teaching)? (0-100%)

Currently, how satisfied are you with your job?

1 – not satisfied 2 – slightly 3 – somewhat 4 – very satisfied 5 – extremely

Please indicate your estimated gross annual salary range:

- _____ Below \$20,000
- _____ \$20,000-\$25,000
- _____ \$25,001-\$30,000
- _____ \$30,001-\$35,000
- _____ \$35,001-\$40,000
- _____ \$40,001-\$45,000
- _____ \$45,001-\$50,000
- _____ \$50,001-\$55,000
- _____ \$55,001-\$60,000
- _____ \$60,001-\$65,000
- _____ Above \$65,000