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Assessing Relationships Among Autonomy, Supportive Leadership, and Burnout in Public Elementary Teachers

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Abstract

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by

Jana Rose Benson

M.S. Grand Canyon University, 2011

B.S. University of Lynchburg, 1978

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Abstract

Stress and burnout among teachers are serious problems because of the negative
consequences associated with them that have contributed to the current crisis in the
American education system. Until the problems of teacher stress and burnout are
understood and addressed, efforts to restructure American education cannot succeed. This
study assessed the relationships among perceived autonomy, perceived transformational
leadership style and burnout in public elementary teachers, and the moderating/mediating
influence of teacher orientation (Montessori and traditional) on burnout levels. An
integration of Maslach's multi-dimensional burnout theory, self-determination theory,
and the theory of transformational leadership formed the theoretical foundation of the
study. A nonexperimental correlational design was used with survey methodology. A
convenience sample of 82 public elementary teachers were recruited via educator social
media sites and professional associations. Participants completed an online survey via
Survey Monkey. Multiple regression analyses determined strong negative relationships
among the predictor variables and the three dimensions of burnout as well as the
significant predictive power of the independent variables. Moderation analyses
determined a significant influence of teacher orientation across these relationships. The
mediation analysis determined that teaching autonomy was a significant mediator
between teacher orientation and emotional exhaustion burnout. The results from this
study may be used for positive social change by developing strategies to mitigate burnout
in public elementary teachers, increase engagement, improve teacher retention, ultimately
improving student achievement and engagement.

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Dedication

This dissertation is dedicated to my daughter Catherine, my dear friend Alice, and all my family, friends, and pets whose love and support made completion of this journey possible.

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Chapter 1: Introduction to the Study

Introduction

Teaching is one of the most demanding and stressful professions, with most teachers experiencing high levels of stress that exceed those of most other professions (Wiggins, 2015; Will, 2017). Teaching is consistently among the top three most stressful professions, according to the results of ranking studies across 80 occupations (Johnson et al., 2005; Wiggins, 2015). Though there are many factors contributing to teacher stress, there are universal conditions of teaching that preexist other stressors that may result in burnout in teachers such as long hours, isolation from other adults, a heavy workload, and the frequent and consistent changes imposed by policy mandates in public school environments (Wiggins, 2015).

A recent national survey of K-12 educators found 61% of educators considered themselves to be stressed most of the time, and another 30% considered themselves to be stressed some of the time, compared to 30% of professionals in the general population, with 25% finding their work to be "always" stressful" (American Federation of Teachers, 2017). The American Federation of Teachers survey included two samples of data. One sample included 830 member teachers who felt that their mental health was not good 7 days in a month, and the remainder (over 4,000 respondents) indicated that their mental health was not good for 12 days in a 30-day period (American Federation of Teachers, 2017). Herman et al. (2018) collected survey results that indicated that the magnitude of the problem of teacher stress was underestimated by the above results. They found much

higher levels of stress (93%) among a sample of public kindergarten through fourth grade elementary teachers in a midwestern school district (Herman et al., 2018).

Among the multiple factors that contribute to burnout and engagement, autonomy and supportive leadership are considered among the most prevalent factors and are nonnegotiable requirements in Montessori school environments enabling the teachers to adhere to the pedagogical framework of the Montessori method (AMI, 2014; Greenberg et al., 2016). Understanding the relationship of organizational (leadership) and work characteristics (autonomy) on burnout and engagement among teachers in traditional versus Montessori schools may help to inform interventions to reduce burnout and increase engagement among teachers. This, in turn, can help to improve teacher retention and effectiveness and lead to stronger schools and better educational outcomes for children.

In this chapter, the relevant literature and theoretical foundations in relation to educator burnout and how the factors of autonomy and supportive leadership contribute to their development in Montessori and traditional teachers are briefly described. Chapter 1 also contains the research questions and hypotheses, the significance and purpose of the study, the problem statement, the nature of the study, the definition of terms, the assumptions, the limitations and delimitations, and the potential social significance of the study.

Background

Burnout is associated with high levels of chronic stress (Alarcon, 2011; McCarthy et al., 2007). The two are often treated synonymously, as the relationship between the two is correlated in the .40 to .49 range, according to the results of a meta-analysis of several large sample size studies (Alarcon, 2011). These correlations may be attributable to moderators of the stressor-burnout relationship such as coping strategies, personality variables, personal and job resources, and after work destressing activities (Cooper & Quick, 2017). Burnout is a syndrome resulting from the psychological response to unrelieved long-term stress that occurs most commonly in human services professionals. Burnout is characterized by three major dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach et al., 1996). Though "syndrome" suggests a clinical disorder, burnout is not a specific DSM-5 or ICD-10/11 diagnosis (World Health Organization, 2018). Burnout shares characteristics with anxiety and depression and is a growing problem throughout the world (World Health Organization, 2018). Despite increasing rates of burnout among teachers, some practice their profession at the engagement end of the burnout engagement-continuum. Engagement is defined as a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption (Schaufeli & Bakker, 2010). The engagement levels in K-12 teachers align with cross professional levels of about 30%. About 57% of full-time K-12 teachers in the United States are not engaged, with about 13% rating themselves as highly disengaged (Hastings & Agrawal, 2015).

Burnout among teachers is associated with negative consequences including serious health disorders, increased absenteeism, intention to quit, increased healthcare costs, acute illness, declining student achievement, destabilized classroom environments, and attrition (Alliance for Excellent Education, 2014; Hastings & Agrawal, 2015; Klusmann et al., 2016; Roelen, et al., 2015; Salvagioni et al., 2017). To understand the problem of burnout and the factors that most contribute to its development, it is essential to understand engagement and how those same factors can contribute to its development. Among the multiple factors that contribute to burnout and engagement, autonomy and supportive leadership are considered among the most prevalent factors and are nonnegotiable requirements in high-fidelity (adhere to Montessori principles) Montessori school environments (Association Montessori Internationale, 2014; Greenberg et al., 2016; Murray, 2011).

Understanding the relationship of organizational (leadership) and work characteristics (autonomy) on burnout among teachers in traditional versus high-fidelity Montessori schools may help to inform interventions to reduce burnout and increase engagement among teachers. This, in turn, can help to improve teacher retention and effectiveness and lead to stronger schools and better educational outcomes for children.

Montessori Vs. Traditional Orientation

Over the past 100 years, the Montessori educational movement has grown from a single small school in a ghetto of Rome to a massive collective of public and private schools throughout the world in essentially every country and community. There are about 4,500 public and private Montessori schools in the United States and about 20,000

throughout the world (North American Montessori Teachers Association, 2018). The

Montessori educational method was developed by Maria Montessori during the early

20th century. It is a child-centered educational approach based on extensive observations

of children across four developmental periods, or "planes," in human development,

beginning at birth and extending to age 24 (Montessori, 2016). The primary focus of

Montessori education is the optimal development of the child in all major domains,

including the physical, social, emotional, and cognitive (Lide, 2018; Montessori, 2016).

In Montessori educational methodology, the development of the whole child is supported.

Children learn as active participants using self-correcting materials, one another, and the

teacher. Curriculum is set by the child's needs and interests and is self-paced. The child

gains understanding through experiences and exploration via the link between physical

exploration and cognition. The child has freedom of movement and can talk if not

disturbing others. Collaboration with the teacher, intrinsic motivation, internal self-

discipline, and unlimited work cycles define the Montessori learning experience.

Children are encouraged and supported in holistic psychosocial and spiritual

development. Montessori classrooms include mixed age groups and the focused

development of both academic and practical life skills (Lide, 2018; Montessori, 2017).

Traditional or conventional educational approaches are drastically different from

Montessori. The major functional difference between Montessori and traditional

education is that traditional education supports the transfer of a standardized curriculum

with children learning from a uniform curriculum and a pre-set schedule that does not

vary per the child's needs. The child is passive and the teacher active in the learning

process with the child being taught only by the teacher. The child is neither encouraged

nor allowed to talk or move around the classroom. Traditional classrooms are teacher-

centric; motivation is extrinsic and is based on behavior modification. The child is given

prescribed work and set times for lessons/subjects with the teacher serving as the enforcer

of external discipline. Traditional classrooms are characterized by containing children of

the same age group, focused on intellectual academic development only with little focus

on social development (Lide, 2018).

The traditional model of education was formed by two major forces: the factory

model and behaviorism (Lillard, 2017). The public education system was established at

the same time as the factory during the mid-19th century, when the focus was on

scientific efficiency. The factory became a pedagogical base for both the curriculum and

assessment models in the public education system, which persists to the present day

(Serafini, 2002). Both models were intended to implement hard science to reduce

uncertainty, standardize products, and ensure more efficient (cost effective) schools

(Murphy, 1997; Serafini, 2002). These models are based on the modernist-philosophical

assumption that all nature is governed by invariable laws. These laws must be discovered

and applied to children to reduce the effect of chance, to control them via standardization,

dehumanization, and cost effectiveness (Serafini, 2002). Standardized testing is the

quality control component of the factory model (Serafini, 2002). It is the ultimate attempt

to control scientifically and leave nothing to chance (Murphy, 1997). The primary

purpose of developing and using standardized testing is to ensure that education is

efficient and effective at producing the most standardized product possible (Serafini,

2002). The adoption of this model as the primary pedagogical model of the public education system rendered school principals as general managers and teachers as mid-level-floor managers rather than scholars and educators, with the primary concern of efficiency and production (Callahan, 1962). This form of a scientific educational model has a reductionistic effect resulting in the school as a factory, the child as raw material to turn into a standardized product, and standardized testing as the ultimate form of quality control (Serafini, 2002).

The second underlying model for traditional education is a pre-Skinnerian behavioral model based on the philosophy of John Locke, which casts the child as an empty vessel filled and formed by deposited information, rewards, and punishments (Lagemann, 1989). Though the work of John Locke may have contained numerous elements of holistic education, these aspects were not adopted by or implemented in the schools of the 19th or 20th centuries. The tabula rasa (blank slate) concept became central to the behaviorism, specifically that of Edward Thorndike, that came to define American education (Lagemann, 1989). In the early 1900s, Edward Thorndike became the most influential educational leader of the times. His assertions determined the direction of the public education system in the United States that continues through the present day (Lagemann, 1989). Thorndike was a behaviorist who posited that students should be taught only measurable knowledge (Lagemann, 1989). The accountability movement associated with the No Child Left Behind Act resulted in further institutionalization of multiple components attributable to Thorndike's continuing influence (Zhao, 2018). Included are a limited view of reading and math scores as the

primary purpose of education, a national obsession with testing and standards, and a suppression of educational innovation because of the requirement for scientific evidence (Zhao, 2018).

Despite efforts over the years to introduce constructivist models into teacher training programs, the factory model has prevailed and appears not to be very applicable or even efficient anymore, as it tends to turn out children who are alike in many ways, despite the preference in industries for variations in individualized training and skills (Lillard, 2017). Though the constructivist views of Dewey, Piaget, Bruner, and Montessori have been introduced into U.S. public schools over the years, they have not to date prevailed for long (Lillard, 2017). The behaviorist views have always returned to the forefront of American education. The constructivist approach posits that children can construct knowledge from experience and environmental stimuli. In the case of Montessori and Piaget, they believed that the child has inner mechanisms that are prominent at periods over the life span that allow them to respond to environmental stimuli on cue to develop literary skills and mathematical skills as well as psychosocial skills. According to Montessori, the child comes with a blueprint to construct the adult which requires only a properly prepared environment (Montessori, 2016).

Overall, constructivism has been demonstrated to be a better model for learning than behaviorism but has not thrived as the model of choice in the United States for two reasons: a) teachers may be trained in it but do not really understand its implementation, and b) in times of economic and social stress, people tend to return to what is most familiar to them (Lillard, 2017). There may be other reasons for the persistence of the

behavioral model in the schools, but the effectiveness of Montessori in both private and public schools has resulted in vast expansion to over 500 public schools throughout the country (North American Montessori Teachers Association, 2018). There is not high fidelity, strict adherence to the Montessori pedagogy in all of these programs, but those that are high-fidelity demonstrate significant gains for Montessori children in mathematics, literacy, problem solving, executive functions, social skills development, and cognitive skills development (Chattin-McNichols, 1981; Dohrmann et al., 2007; Lillard, 2007; 2017; Marshall, 2017; Miller & Dyer, 1975).

Burnout Among Montessori Teachers

Though few studies have been done on burnout among Montessori teachers, an early classic study indicated low to nonexistent levels of burnout among teachers in Montessori schools (Cherniss, 1983). Though numerous factors could be responsible for this lack of burnout found among Montessori teachers, the primary reason cited by the authors was the absence of professionalization and bureaucratization in the schools (Benevene & Fiorilli, 2015; Cherniss, 1983). The schools included in this study were private and not under the control of government agencies as are todays public Montessori programs. A sense of social commitment and communion, connection to the collective whole, and shared strong values characterize these schools which were high fidelity Montessori programs (Benevene & Fiorilli, 2015; Cherniss, 1983). This ideological sense may act as a resiliency factor against burnout. Burnout is partially a result of professionalizing the helping professions from the status of a vocation into that of a modern occupation (Benevene & Fiorilli, 2015; Cherniss, 1983).

Both Montessori and traditional public-school teachers have experienced decreasing levels of autonomy since the teaching profession has become more influenced by the utilitarian values of federal, state, and local education agencies, their imposition of standards and the testing used to enforce the standards (Saeki et al., 2018). Administrators are more prone to support standardized curriculum rather than autonomous curriculum at the level of the child, resulting in greater frustration and disillusionment on the part of teachers as their personal and professional values and commitments to quality education are compromised (Lambersky, 2016). This frustration and disillusionment are more accented in Montessori teachers who have specifically trained to spontaneously generate curriculum per developmental cues observed in the children (American Montessori Society, 2018; Association Montessori Internationale, 2014).

Stress and Burnout Among Teachers

Since Freudenberger's seminal study on staff burnout in the 1970s, the term "burnout" has been in common use (Freudenberger, 1974). Burnout is generally defined as the phenomena encountered when the relationship between individuals and their profession goes wrong (Maslach, 1996). Initially, burnout was noted within the human services professions, but later it was noted in a range of professions in which stress is a consistent element (Maslach, 2001). Burnout is generally considered to be an extended response to long term unrelieved stressors such as work overload, role conflict and ambiguity, and deficient resources that are attributable to one's profession (Chang, 2009; Chang & Davis, 2009; Maslach, 2001; Maslach & Leiter, 2016). Teaching is one of the

human services professions that appears to be plagued by burnout and devastated by the resulting consequences such as serious health disorders, increased absenteeism, intention to quit, increased healthcare costs, acute illness, declining student achievement, destabilized classroom environments, and attrition (Herman et al., 2018; Hill & Barth, 2004; Levine, 2013). It is generally known that public school teaching is among the more high-stress professions, characterized by mandated high stakes testing and accountability sanctioning (Levine, 2013; Ryan et al., 2017). The high rates of teacher attrition and other costs associated with the consequences of high stress and burnout in public schools are a problem because they not only result in low teacher quality and poor student achievement, but they stress the federal and state budgets due to the costs of substitutes, medical expenses, separation, recruitment, hiring, and training (Alliance for Excellent Education, 2014; Herman et al., 2018). Over 50% of teachers in the United States leave the education profession within the first 5 years at a cost of over 2.2 billion dollars annually, and another 7.3 billion is required to cover the costs of teacher substitutes and other absenteeism and illness related costs (Alliance for Excellent Education, 2014; Carver-Thomas & Darling-Hammond, 2019; Ingersoll, 2001; National Education Association, 2018).

Teacher Stress Factors

There are many factors at both the personal and organizational levels that result in teacher stress and burnout. Teacher personal factors include demographic features, teacher social support, and family characteristics. Organizational factors include leadership-administrative support, work load/overload, collegial support, curriculum

autonomy, recognition, a sense of community, inadequate salary, student discipline problems, lack of teacher influence, deficient student motivation, overly large class sizes, inadequate prep time, unsafe environments, little opportunity for professional advancement, interference in teaching, lack of professional competence of colleagues, and intrusions on teaching time (American Federation of Teachers, 2017; Darling-Hammond, 2003; Fernet et al., 2016; Goldring et al., 2014; Ingersoll, 2001; Schaefer et al., 2012;). The five most prevalent factors are lack of collaboration with colleagues and leaders, deficient professional development opportunities, negative student performance outcomes, lack of autonomy, and lack of supportive leadership (American Federation of Teachers, 2017; Darling-Hammond, 2003; Fernet et al., 2016; Goldring et al., 2014; Ingersoll, 2001; Schaefer et al., 2012). These are critical in determining if the teacher can adapt to the environment and maintain the personal characteristics that will ensure success.

From the multiple factors at both the personal and organizational levels that result in teacher stress and burnout, the lack of supportive leadership and autonomy are among the most prevalent factors (Deci et al., 2017; Gagne & Deci, 2005; Greenberg et al., 2016). According to Denmark (2012), more teachers leave the profession because of their perception of the inadequacy or lack of supportive leadership than for any other reason.

A lack of supportive leadership and autonomy are the focus of this study as they are considered primary stressors, particularly when experienced by Montessori teachers who have been trained specifically to respond spontaneously to student cues with autonomy and support from school leaders (American Montessori Society, 2018;

Denmark, 2012; Gagne, 2014). More teachers leave the profession because of their

perceptions of inadequate administrative support and inadequate leadership than for any

other reason, with higher rates in new and less experienced teachers (Darling-Hammond,

2003; Denmark, 2012; Goldring et al., 2014). Leadership that fails to address the needs of

the faculty, staff, and school community seems to be the primary complaint among

former and current teachers and the most prevalent factor contributing to teacher stress

and burnout (Ingersoll, 2012; Levine, 2013; Riggs, 2013;). With collaboratively trained

educational leaders, many of the burnout inducing problems that affect teachers can be

addressed (Player et al., 2017; Thibodeaux et al., 2015).

The Impact of Autonomy and Supportive Leadership on Teacher Burnout

Autonomy is a universal psychological need that is essential in all professions if

engagement is to be achieved (Gagne, 2014). It is also one of the major characteristics of

Montessori pedagogy that defines the method and is central to the child-centered

educational philosophy. Though autonomy is not considered essential to traditional

pedagogy, other than a minimal degree to allow the teacher to deal with spontaneous

situations, it may be essential for engagement to occur.

Non supportive leadership that does not meet the needs of the faculty, staff, and

school community is the principal grievance among former and current teachers and the

most prevalent factor contributing to their stress and burnout (Ingersoll, 2001; Levine,

2013; Riggs, 2013). With appropriately trained educational leaders, many of the burnout

inducing problems that affect teachers and drive them away from the profession can be

remedied and retention can be increased significantly. Burnout occurs when teachers are

faced with insurmountable obstacles to effective and rewarding teaching experiences

resulting from organizational problems that can effectively be addressed when school

leaders are trained to provide essential support to teachers and staff (Player et al., 2017;

Thibodeaux et al., 2015).

Training school leaders in a manner that impacts staff by engendering respect,

trust, and admiration, which is the goal of transformational leadership, may be an

essential approach to solving the stress-burnout problem and eliminating its devastating

consequences (Balyer, 2012). Providing teachers with the freedom to select and

implement curriculum best suited to meeting the needs of their students and that reflects

the personal values and educational beliefs of the teacher has the potential to improve

engagement and decrease stress and burnout (Balyer, 2012).

It is not known to what extent the greater autonomy and leadership support

experienced by Montessori teachers may affect the overall outcomes in the schools,

specifically as they relate to burnout and engagement. This study will attempt to

determine if these factors have a significant influence on burnout, which could provide

insights for burnout intervention approaches among public-school teachers. The purpose

of this study is twofold: 1) to assess the relationships among autonomy and supportive

leadership and burnout and engagement in public elementary teachers, and 2) to assess

the differences in burnout and engagement profiles between Montessori and traditional

elementary teachers. Comparing teachers from these two philosophically diverse

traditions has the potential to provide insights that can inform the development of school

leadership and culture in a manner that will perpetuate engagement by mitigating key

antecedents of burnout. The study will focus on teacher perceptions about autonomy and supportive leadership, which are considered major factors associated with burnout and engagement in public elementary school teachers (Greenberg et al., 2016; Skaalvik & Skaalvik, 2014). The data on relationships among burnout and perceived autonomy and supportive leadership in Montessori and traditional teachers that were acquired through this study could provide an empirical basis for burnout intervention/mitigation efforts needed in the public schools.

Problem Statement

For many decades, teaching in the public schools has been ranked among the most high-stress professions with correspondingly high burnout rates. Burnout is a syndrome resulting from the psychological response to unrelieved long-term stress that occurs most commonly in human services professionals and is characterized by three major dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach & Leiter, 2016; Maslach et al., 1996). Though rates of frequent, chronic stress as high as 61% have been reported among teachers at all grade levels, rates as high as 93% have been reported among elementary teachers (Walker, 2018). Despite the high rates of burnout among teachers, there are teachers who are not burnt-out and practice their profession at the engagement end of the burnout engagement spectrum. Engagement is defined as a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption (Schaufeli & Bakker, 2010). About 57% of full-time K-12 teachers in the United States are not engaged, with about 13% rating themselves as actively disengaged (Hastings & Agrawal, 2015).

Burnout among teachers is a serious problem because of the negative consequences associated with it, including serious health disorders, increased absenteeism, intention to quit, increased healthcare costs, acute illness, declining student achievement, destabilized classroom environments, and attrition (Alliance for Excellent Education, 2014; Hastings & Agrawal, 2015; Klusmann et al., 2016; Roelen et al., 2015; Salvagioni et al., 2017). To understand the problem of burnout and the factors that most contribute to its development, it is essential to understand engagement and how those same factors can contribute to its development. Among the multiple factors that contribute to burnout and engagement, autonomy and supportive leadership are considered among the most prevalent factors and are also nonnegotiable requirements in high fidelity (adhere to Montessori principles) Montessori school environments (AMI, 2014; Greenberg et al., 2016). Understanding the relationship of organizational (leadership) and work characteristics (autonomy) on burnout and engagement among teachers in traditional versus Montessori schools may help to inform interventions to reduce burnout and increase engagement among teachers. This, in turn, can help to improve teacher retention and effectiveness and lead to stronger schools and better educational outcomes for children. With the historically high rates of teacher burnout and attrition, America's education system is in crisis. Until the problems of teacher stress and burnout are understood and addressed, current efforts to restructure American education cannot succeed (Farber, 1991).

Despite the complexity of the problem of teacher stress and burnout, both leadership and autonomy are major contributing factors, and they must be adequately

understood and addressed for the problem to be effectively mitigated (Denmark, 2012,

Skaalvik, 2016; Haydon et al., 2018). The relationships between burnout and teachers'

perceptions of autonomy and supportive leadership in Montessori versus traditional

teachers have not yet been measured, so it is unknown if there are significant differences

in these relationships between these diverse educational methods.

Purpose of the Study

The purpose of this study is twofold: 1) to assess the relationships among

autonomy and supportive leadership and burnout in public elementary teachers, and 2) to

assess possible differences in burnout patterns between Montessori and traditional

elementary teachers. Comparing teachers from these two pedagogically diverse

educational methods has the potential to provide insights that can inform the development

of school leadership and culture in a manner that will perpetuate engagement by

mitigating key antecedents of burnout. Burnout is measured with three subscales:

emotional exhaustion, depersonalization, and personal accomplishment. These three

subscales compose the dependent variable, burnout. The study focused on teacher

perceptions of autonomy and supportive leadership, which are considered major factors

associated with burnout in public elementary school teachers (Greenberg et al., 2016;

Skaalvik & Skaalvik, 2014). An increased understanding of burnout as it relates to

teacher perceptions of autonomy and school leadership was determined by comparing

Montessori and traditional elementary teachers.

Research Questions and Hypotheses

RQ1: To what extent does perceived autonomy, as measured by the Teaching

Autonomy scale (TAS), relate to the components of burnout (emotional exhaustion,

depersonalization, and personal accomplishment), as measured by Maslach Burnout

Inventory-Educator Survey (MBI-ES) subscales among elementary teachers?

$H_{\emptyset 1}$: Perceived autonomy is not a significant predictor of burnout.

H_1: Perceived autonomy is a significant predictor of burnout.

RQ2: To what extent does teacher orientation moderate the relationship between

perceived autonomy and the components of burnout (emotional exhaustion,

depersonalization, and personal accomplishment) in elementary teachers?

$H_{\emptyset 2}$: Teacher orientation does not significantly moderate the relationship between

perceived autonomy and burnout.

H_2: Teacher orientation does significantly moderate the relationship between

perceived autonomy and burnout.

RQ3: To what extent does perceived supervisor leadership style, as measured by

the transformational leadership scale of the Multifactor Leadership Questionnaire (MLQ),

relate to the components of burnout (emotional exhaustion, depersonalization, and

personal accomplishment), as measured by MBI-ES subscales, among elementary

teachers?

$H_{\emptyset 3}$: Level of perceived supervisor leadership style is not a significant predictor

of burnout.

H_3: Level of perceived supervisor leadership style is a significant predictor of

burnout.

RQ4: To what extent does teacher orientation moderate the relationship between

perceived supervisor leadership style and the components of burnout (emotional

exhaustion, depersonalization, and personal accomplishment) among elementary

teachers?

$H_{\emptyset 4}$: Teacher orientation does not significantly moderate the relationship between

perceived supervisor leadership style and burnout.

H_4: Teacher orientation does significantly moderate the relationship between

perceived supervisor leadership style and burnout.

Theoretical Framework

Maslach's multi-dimensional burnout theory (MMBT) is the most comprehensive

framework for conceptualizing burnout and addressing the need for solutions in the

workplace (Maslach, 1998). The work life theory is an extension of the MMBT that aides

in the understanding of burnout development as a function of person job match or

mismatch (Leiter & Maslach, 1999). The Leiter model emphasizes the central position of

emotional exhaustion as it relates to stress and the development of the other two domains

of burnout in the process of becoming a full-blown burnout syndrome (Leiter, 1989).

Self-determination theory emphasizes the importance of satisfying the basic

psychological need for autonomy to ensure teacher engagement (Gagne, 2005; Skaalvik

& Skaalvik, 2014). Many of the leadership-centered factors that contribute most

significantly to teacher burnout can be addressed by implementing the theory of transformational leadership (Player et al., 2017; Smith, 2016; Thibodeaux et al., 2015).

The MMTB conceptualizes burnout in the three dimensions: emotional exhaustion (feelings of being emotionally and psychologically drained), depersonalization (unfeeling, cynical detachment), and personal accomplishment (reduced feelings of competence and accomplishment (Maslach, 1998). Burnout has an impact on the quality of work and implications for psychological as well as professional well-being. The theoretical framework for burnout was derived from the dehumanization and caring detachment practices found in the medical field as a means of coping with the stressors of treating the ill (Maslach, 1998). The MMBT also extends to the other end of the continuum. Burnout has an opposite known as engagement, which consists of vigor, involvement, and dedication. Consideration of the burnout-engagement continuum can provide insights into the organizational factors that contribute to experiences of both extremes. The organizational factors that contribute to one or the other may also be used as a template for the prevention of burnout or the development of engagement.

The work life theory is a logical extension of Maslach's multidimensional burnout theory and helps to clarify the development of burnout in response to environmental factors (Maslach & Leiter, 1997). Multiple personal and environmental factors contribute to the development of job burnout that relate to the individual and the degree of match or mismatch in the six major areas of work life that encompass the core relationships with burnout: workload, control, reward, community, fairness, and values (Maslach & Leiter, 1997; 2016). Mismatches in major areas result in burnout, whereas matches result in

engagement. This model has helped to generate order among a wide variety of environmental-situational correlates including autonomy and supportive leadership (Maslach et al., 2001; McFadden et al., 2018).

The Leiter model places emotional exhaustion in a central position, making it most appropriate for education professionals because of the excessive number of emotionally exhaustive factors they are required to negotiate (Leiter, 1989). Exhaustion results primarily from mismatches in workload and job control because of the excessive demands both place on the teacher and the anxiety they induce (Maslach & Leiter, 2008). A manageable workload results in sustainable energy levels while reducing the risk of burnout. Work overload is a major contributor to exhaustion and often results in burnout, as it serves as the primary stress component (Karasek & Thorell, 1990). Lack of job control, which limits the sense of autonomy and discretion necessary to make regulatory decisions regarding workload, is a common source of work overload, particularly among educators (Portoghese et al. 2014). The prevalence of job control (autonomy) plays a major role in determining the development of burnout or engagement in the work environment. Enough autonomy enables the individual to shape their work environments, creating a balanced manageable workload (Korunka et al., 2011). The two constructs are closely related in this respect (Maslach & Leiter, 2003).

Self-determination theory is a theory of human motivation that proposes three universal psychological needs are essential for healthy personality development, integration, and wellbeing (Deci & Vansteenkiste, 2004). These innate universal needs include autonomy, relatedness, and competence (Deci & Vansteenkiste, 2004).

Competence is the need to control outcomes and achieve mastery; relatedness is the need

to interact with, be connected to, and experience reciprocal caring; and autonomy is the

need to be causal agents of one's own life and act in harmony with one's integrated self

(Deci & Vansteenkiste, 2004). As teachers' psychological needs attainment are

compromised by excessive job demands or by deficient resources, they become more

vulnerable to developing burnout (Fernet et al., 2013).

Non supportive school leadership is one of the factors contributing to teacher

dissatisfaction, stress, and burnout (American Federation of Teachers, 2017). Low quality

leadership that does not meet the needs of the faculty and school community is a

prevalent complaint among teachers (Balyer, 2012). A successful school environment

requires leadership that provides inspiration and empowerment to the teachers and the

school community. School leaders must establish and sustain a vision, instill trust,

confidence, and pride in the school, and provide intellectual stimulation if they are

committed to creating a successful school environment (Smith, 2016). Transformational

leadership ideally meets the needs for successful school leadership. The collaborative

nature of transformational leadership results in collective empowerment of faculty, staff,

students, and the extended school community (Smith, 2016). The research base in

transformational leadership suggests that it is a powerful and effective model when

implemented in school environments that has the potential to increase retention in its

capacity to address and remedy many of the leadership-centered factors that contribute

most significantly to teacher burnout (Player et al., 2017; Smith, 2016; Thibodeaux et al.,

2015). Transformational leaders who implement one or more of the four dimensions of

TFL: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, into their supervisory methods as resources experience significant results related to the prevention and mitigation of burnout and attrition among teachers (Hildenbrand et al., 2018).

The MMBT and the work life theory provide a basis for understanding the relationships between the three dimensions of burnout and the two independent variables, perceived autonomy and supportive leadership. The Leiter model focuses on the prevalence of emotionally exhausting antecedents experienced by teachers, specifically, deficits in autonomy and supportive leadership, and their influence on the development of full-blown burnout (Leiter, 1989). Self-determination theory expands on the critical nature of autonomy and relatedness to school leadership in ensuring that psychological needs are met, ensuring that burnout is mitigated or prevented, and engagement develops. Transformational leadership theory clarifies the leadership factor in burnout and the importance of training school leaders in collaborative methods to promote engagement among teachers and the school community.

Nature of the Study

A quantitative research design was used in this study to assess the relationships between the independent variables (perceived teaching autonomy and supportive leadership style) and the dependent variables (teacher emotional-exhaustion, depersonalization, and personal accomplishment burnout). Multiple regression analyses were performed and moderating and mediating multiple regression analyses were performed to assess the moderating or mediating influence of teacher orientation on all

significant relationships. The scores from the Montessori and traditional teacher MBI-ES subscales were compared to determine if significant differences exist between the two types of teachers in the three burnout dimensions. The data generated from the MBI-ES, the TAS, and the MLQ were analyzed to determine the relationships between the independent and dependent variables. The Montessori profiles provided a potential model for the mitigation of burnout in both traditional and low fidelity (not conforming to Montessori principles) Montessori teachers. This study provided information on the three dimensions of burnout as they relate to perceived autonomy and supportive leadership (Maslach et al., 2001). In addition, the analyses determined the relationships between the dependent and independent variables across teacher orientation. The teachers in the sample were described in terms of age, gender, years of teaching experience, certification type, educational background, school title classification, class size, grade level, and environment type.

Definitions

American Montessori Society (AMS): The AMS was established in the late 1960s by Nancy McCormick Rambusch on the premise that aspects of the Montessori method had to be modified to accommodate the culture in America. In AMS schools, teachers continue the methods developed by Dr. Montessori while bringing in outside resources, materials, and ideas to extend or supplement the Montessori curriculum. Examples include the use of technology and current events (AMS, 2018).

Association Montessori Internationale (AMI): The AMI is an international organization that was established by Maria Montessori and her son Mario in 1929 and has

international headquarters in Amsterdam, the Netherlands. In AMI schools, Montessori philosophy and curriculum are implemented in a way that is consistent with the original approach of Maria Montessori. The Montessori materials are used precisely in the manner used by Dr. Montessori without deviation or extensions; preserving what proponents of this interpretation believe is the purity of the method (AMI, 2018).

Autonomy (teacher): Autonomy refers to the professional independence of teachers in schools, especially the degree to which they can make autonomous decisions about what they teach to students and how they teach it. In recent years, teacher autonomy has become a major point of discussion and debate in American public education, largely because of educational policies that, some argue, limit the professionalism, authority, responsiveness, creativity, and effectiveness of teachers. (Glossary of Educational Reform, 2014).

Burnout: Burnout is a syndrome resulting from the psychological response to unrelieved long-term stress that occurs most commonly in human services professionals and is characterized by one or more of three major dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach et al., 1996).

Collaborative leadership: Collaborative leadership styles distribute power, authority, and responsibility across the group. Leadership fosters shared commitments, helps resolve conflicts, facilitates lasting relationships, and stimulates effective action. Collaborative leadership is characterized by networking, communicating, and cooperating with others. It requires a greater use of time and resources and involves information sharing, harmonization of operations and activities, and sharing of resources for the

purpose of enhancing the capacity of all stakeholders. There is an equal sharing of power

and authority; all stakeholders view themselves as equals. Participating entities realize

that they are interdependent. They work together with the knowledge that they cannot

achieve their missions and goals without the contributions of the other entities.

Collaboration is characterized by lasting relationships, high levels of a reciprocal

investment, focus, trust, mutual commitment, and a strong sense of joint ownership of

positive outcomes for youth and families (Hallinger & Heck, 2010).

Depersonalization: Depersonalization describes the detachment dimension of

burnout that manifests in an unfeeling, cynical, and impersonal response towards the

recipients of one's service or care. It is one of the three dimensions of burnout measured

by Maslach's burnout inventory (Maslach & Jackson, 1981).

Emotional exhaustion: Emotional exhaustion is a chronic state of physical and

emotional depletion that results from excessive job and/or personal demands and

continuous stress. It describes a feeling of being emotionally overextended and exhausted

by one's work. It is manifested by both physical fatigue and a sense of feeling

psychologically and emotionally drained. It is one of the three dimensions of burnout

measured in Maslach's burnout inventory (Maslach & Jackson, 1981).

Engagement: Engagement is a positive, fulfilling, work-related state of mind that

is characterized by vigor, dedication, and absorption (Schaufeli & Bakker, 2010).

High-fidelity Montessori: An implementation of the Montessori method of

education that adheres to the guidelines of the AMS and the AMI is known as high-

fidelity Montessori.

Montessori method of education: The Montessori method of education is a method of education developed by Maria Montessori. It is a child-centered educational approach based on scientific observations and identification of developmental cues in children from birth to adulthood. Montessori's method has been used for over 100 years in many parts of the world. The Montessori method views the child as one who is naturally eager for knowledge and capable of initiating learning in a supportive, thoughtfully prepared learning environment. It attempts to develop children physically, socially, emotionally, and cognitively. Although a range of practices exist under the name "Montessori," the AMI and the AMS cite the following elements as essential:

1. Mixed age classrooms; classrooms for children ages 2½ or 3 to 6 years old are by far the most common, but 0–3, 3-6, 6–9, 9–12, 12–15, and 15–18-year-old classrooms exist as well.

2. Student choice of activity from within a prescribed range of options.

3. Uninterrupted blocks of work time, ideally 3 hours.

4. A constructivist or "discovery" model, where students learn concepts from working with materials, rather than by direct instruction.

5. Specialized educational materials developed by Montessori and her collaborators often made from natural, aesthetic materials such as wood, rather than plastic.

6. A thoughtfully prepared environment where materials are organized by subject area, are within reach of the child, and are appropriate in size.

7. Freedom of movement within the classroom.

8. A trained Montessori teacher who follows the child and is highly experienced

in observing the individual child's characteristics, tendencies, innate talents,

and abilities (American Montessori Society, 2018; Association Montessori

Internationale, 2014; Oswald,1997).

Normalization: Normalization is a term used to describe the state a child reaches

in a Montessori prepared environment that results in love of order, love of work,

spontaneous concentration, attachment to reality, love of silence and of working alone,

sublimation of the possessive instinct, power to act from real choice, obedience,

independence and initiative, spontaneous self-discipline, and joy. Montessori believed

that these are the truly "normal" characteristics of childhood, which emerge when

children's developmental needs are met (Montessori, 1949).

Personal accomplishment: Personal accomplishment is the feeling of competence

and successful accomplishment in one's work with people, which is often reduced in

individuals experiencing burnout. It is one of the three dimensions of burnout measured

by Maslach's burnout inventory (Maslach & Jackson, 1981).

Supportive leadership: Supportive school leadership is an essential component of

a successful school environment. Those characterized by supportive leadership seek to

inspire and empower faculty and staff to achieve success by setting a vision and instilling

trust, confidence, and pride in the school while providing intellectual stimulation (Smith,

2016).

Transformational leadership: Transformational leadership is a style of leadership

that ideally meets the needs for school supportive leadership as the collaborative nature

of transformational leadership results in collective empowerment of faculty, staff, students and the extended school community (Smith, 2016). As a result of its implementation, the school is transformed into a dynamic entity bringing about change even within a challenging bureaucratic/politically charged environment (Smith, 2016).

Assumptions

This first assumption of this study was that the participants responded completely and accurately to questions on all instruments administered including the MBI-ES, the TAS, and the MLQ. It was also assumed that their responses reflected their actual experiences as related to autonomy, supportive leadership, and degree of burnout. It was further assumed that the participants accurately interpreted the meaning of each question on the instruments and responded according to this understanding. It was also assumed that the Montessori teacher participants were high fidelity, and their schools provided the necessary autonomy and supportive leadership.

Scope and Delimitations

Though there are numerous factors that contribute to teacher stress and burnout, only two were the focus of this study. Teaching autonomy and supportive leadership are the two most prevalent contributing factors to stress and burnout or teacher engagement depending on the degree of implementation in the school environment. Montessori pedagogy, by its nature, requires near total autonomy in teachers to respond to the needs of the child and this must be reinforced with total support from school leadership to be fully implemented. Thus, high fidelity Montessori environments generate high fidelity Montessori teachers. As these two factors are considered key in understanding teacher

burnout, this study considered these two factors in relation to teacher orientation (Montessori or traditional) in predicting burnout in teachers. The intent was to determine if these factors predict lower burnout and higher engagement levels in high fidelity Montessori teachers than in traditional teachers. Higher levels of engagement and lower levels of burnout were found in Montessori teachers as predicted by their greater levels of allowed autonomy and leadership support. These findings will provide direction for future burnout mitigation models. The requirements for both Montessori and traditional teacher participants were posted on the social media sites used for recruiting (Appendix A and B).

Limitations

Though information on the background characteristics of the study participants was collected, it was not the intent of this study to control for these variables. Participant information, including years of teaching experience, age, marital status, level of education, gender, and teacher orientation, was collected to describe the sample. Age and years of teaching experience were measured on a continuous scale. Marital status was selected from the following: married, single, separated, and divorced. Level of education was selected from the following: Bachelor's degree, Master's degree, Doctoral degree, and other. Further, gender was selected from: male, female, and other. Teacher orientation was Montessori or traditional. These variables may have influenced the outcome of the study to some extent, but it has not been clearly indicated that any of these variables, except for teacher orientation, influenced the study variables to any

significant extent. As it was not determined that the major outcomes were significantly influenced or confounded by any of these, it was not necessary to control for them.

One limitation of this study is that the design was correlational. Thus, causal inferences about observed relationships among study variables were not possible. A second limitation was that the participants took the assessments through an online survey administrator and had no technical assistance if they had technical challenges. This could have had a major influence on the validity of data collected. A third limitation of the study was the potential impact of COVID-19 on teachers' perceptions of situations in their school environments. Many teachers have been out of the regular classroom for several months, some have only recently returned, and in many schools, teachers have returned only on a part time or reduced schedule. Many schools have divided students into two groups who attend on different days, so they are teaching at 50% capacity, and many schools are still in virtual mode. This lack of normalcy may have a strong influence in teachers experiences during COVID-19 as compared to during the pre-COVID period. This could also have had an impact on the validity of the data as reflective of the perceptions of teachers under normal conditions.

Significance

The primary significance of this study is the information that it will provide on the relationships among perceived autonomy and supportive leadership and teacher burnout in Montessori versus traditional schools. The empirical research data, such as that resulting from this study, will inform school systems in the development of burnout prevention interventions that will increase engagement among teachers. Many of the factors that result in teacher burnout may be identified, quantified, and mitigated through

programs focused on increasing engagement. The contribution that this study will make to the theory and research on teacher burnout, primarily entails providing an enhanced understanding of two of the most prevalent antecedents of teacher burnout: perceived autonomy and supportive leadership. The examination of these key factors within educational environments that may be associated with lower levels of burnout will potentially inform mitigation policies that will foster engagement in elementary teachers and school environments. This is the primary mechanism by which social change will be enacted in relation to this study.

<div align="center">**Summary**</div>

Teaching in the public schools has been for the past 50 years and continues to be one of the most high-stress professions with matching high burnout rates. This presents a profoundly serious problem with approximately 70% of full-time K-12 teachers in the United States experiencing some degree of disengagement, and many of them burnout. Burnout among teachers is a serious problem because of the negative consequences associated with it, including serious health disorders, increased absenteeism, intention to quit, increased healthcare costs, acute illness, declining student achievement, destabilized classroom environments, and attrition. Understanding the problem of burnout and the factors that most contribute to its development provides a foundation for burnout mitigation. Among the multiple factors that contribute to burnout and engagement, perceived autonomy and supportive leadership are considered among the most prevalent factors and are also nonnegotiable requirements in Montessori school environments. Understanding the relationship of organizational (leadership) and work characteristics

(autonomy) on burnout among teachers in traditional versus Montessori schools may help to inform interventions to reduce burnout and increase engagement among teachers. This, in turn, can help to improve teacher retention and effectiveness and lead to stronger schools and better educational outcomes for children.

Chapter 2 includes a review of the literature on the study variables, perceived teaching autonomy, supportive leadership (transformational leadership), teacher orientation, and the three dimensions of burnout. It includes discussion on the components forming the theoretical foundation of the study, as well as the foundational theories that inform and support the hypotheses and the psychological constructs that form the substance of the study.

Chapter 2: Literature Review

Introduction

Burnout among teachers is a serious problem because of the negative consequences associated with it, including serious health disorders, increased absenteeism, intention to quit, increased healthcare costs, acute illness, declining student achievement, destabilized classroom environments, and attrition (Alliance for Excellent Education, 2014; Hastings & Agrawal, 2015; Klusmann et al., 2016; Roelen, et al., 2015; Salvagioni et al., 2017). This study was an assessment of the relationships among supportive leadership, autonomy, and burnout in public elementary teachers. I also assessed the differences in burnout between Montessori and traditional elementary teachers. Comparisons between Montessori and traditional teachers, which involves two philosophically diverse traditions, have the potential to provide insights that can inform the development of school leadership and culture in a manner that will perpetuate engagement by mitigating key antecedents of burnout. The study focused on teacher perceptions about autonomy and supportive leadership, which are considered major factors associated with burnout and engagement in public elementary school teachers (Greenberg et al., 2016; Skaalvik & Skaalvik, 2014). This was done with the underlying assumption that Montessori teachers in high-fidelity programs experience high levels of autonomy, which is understood and supported by school leaders as an integral and non-negotiable characteristic of Montessori pedagogy that distinguishes it from traditional approaches (Montessori, 1997).

        The autonomy requirement of Montessori cannot be met unless the leadership is supportive of the autonomy and the teacher as a professional and an equal integral member of the community. Both autonomy and supportive leadership are key elements in high-fidelity Montessori environments and are integral to the engagement of the teachers and the success of the students (Montessori, 1997). Though teacher burnout and engagement are dependent upon multiple factors, autonomy, and supportive leadership weigh in as among the most critical in negatively predicting burnout, and positively predicting engagement (Bailey, 2014; Skaalvik & Skaalvik, 2016). Though not necessarily integral components of traditional educational pedagogy, both are core components of the Montessori pedagogy. Before the onset of the high stakes testing era, traditional teachers had greater autonomy in the development of curriculum and performance standards in their schools and classrooms and have since experienced a significant loss of that autonomy because of accountability mandates which resulted in prescriptive curriculum (Schinkel, 2010). Teachers thrive better under conditions of curricular autonomy than curricular regulation as it reduces burnout and increases engagement (Schinkel, 2010). Montessori teachers have not experienced as great of a loss because of the dependent relationship between autonomy and the Montessori pedagogy, which is generally acknowledged by the public schools that offer the Montessori option. Autonomy is a requirement for engagement across professions, and the perception of autonomy predicts both engagement and burnout depending on the level of decision latitude allowed/encouraged within the school environment (Gagne, 2005; Skaalvik & Skaalvik, 2014).

To affect both autonomy and supportive leadership in the school's transformational leadership training is essential. The behavior of collaborative-transformational leaders in schools positively influences teachers' engagement, while non-collaborative-non-supportive leadership styles contribute to teacher burnout (American Federation of Teachers, 2017; Parks et al., 2016). The research base in transformational leadership suggests that it is a powerful and effective model when implemented in school environments that has the potential to increase retention in its capacity to address and remedy many of the leadership-centered factors that contribute most significantly to teacher burnout and establish engagement (Player et al., 2017); Smith, 2016; Thibodeaux et al., 2015).

In this chapter, a review of the literature on burnout and engagement as they apply to and develop in public elementary teachers is presented. This includes a discussion of the theoretical base of the phenomenon and the consequences it has on teachers, schools, and student educational outcomes. An examination of the literature related to each of the study variables: burnout, supportive leadership, and teaching autonomy, specific to public elementary teachers, will be provided. A comprehensive discussion of Montessori elementary philosophy and pedagogy will be presented to clearly define the advantages that the educational method may provide in mitigating teacher burnout, particularly the type caused by lack of autonomy and non-supportive school leadership and the development of engagement.

Literature Search Strategy

The search for relevant literature included the following databases: Academic Search Complete, JSTOR Journals, MEDLINE with Full Text, ProQuest Central, PsycARTICLES, PsycInfo, SAGE Premier, Embase/Medline, PLOS, Emerald Insight, ERIC/Education Source, NCES Publications, OECD Publications, Taylor and Francis Online and Google Scholar overlaps many of these databases. Search parameters were peer reviewed, full text articles from 1970 to 2020. The following search terms and combinations of terms were used to locate specific resources for the literature review: *burnout, teacher/educator burnout, teacher stress, teacher engagement, Montessori principles, predictors of teacher stress, antecedents of teacher stress/burnout, teacher attrition, intent to quit, consequences of burnout/stress, assessments: teacher autonomy, supportive leadership in the schools, burnout/engagement, reliability of the three assessments, validity of the three assessments, , intent to quit, intent to leave, turnover, predictors of teacher burnout, engagement, organizational/school climate, organizational/school factors, transformational leadership,* and *collaborative leadership.*

Theoretical Foundation

In this study, I examined the relationships among perceived teaching autonomy, supportive leadership, and burnout in Montessori and traditional public elementary teachers. As the nature of the relationships among teacher burnout, perceived teaching autonomy, and supportive leadership are complex, the theoretical framework required to clarify these relationships must address this multifactorial complexity by integrating several theories. The three theories that form the basis of the theoretical framework for this study are Maslach's MMBT and its extensions the Leiter model and the work life

model; self-determination theory; and the transformational leadership model. The MMBT is the most comprehensive framework for conceptualizing burnout and addressing the need for solutions in the workplace (Maslach, 1998). The Leiter model extends the MMBT by emphasizing the central position of emotional exhaustion as it relates to stress and the development of the other two burnout constructs in the process of becoming a full-blown burnout syndrome (Leiter, 1989). The work life theory is an extension of the MMBT that aides in the understanding of burnout development as a function of person job match or mismatch (Leiter & Maslach, 1999). Self-determination theory emphasizes the importance of satisfying the basic psychological need for autonomy to ensure teacher engagement (Gagne, 2005; Skaalvik & Skaalvik, 2014). Transformational leadership theory addresses the many leadership-centered factors that contribute most significantly to teacher burnout (Player et al., 2017; Smith, 2016; Thibodeaux et al., 2015).

Maslach's Multi-Dimensional Burnout Theory

MMBT is the most comprehensive framework for conceptualizing burnout and addressing the need for solutions in the workplace (Maslach, 1998). The MMBT conceptualizes burnout in the three constructs of emotional exhaustion, depersonalization, and reduced personal accomplishment. Emotional exhaustion is a sense of being over extended and deplete of resiliency; depersonalization involves a cynical and usually negative detachment from others resulting from emotional exhaustion; and an increased sense of ineffectiveness resulting from negative self-evaluation and a sense of not being able to help clients/students is often associated with depression (Maslach, 1998). Burnout has pervasive effects throughout the social and

personal domains of an individual's life. It also has an impact on the quality of work and the implications for psychological as well as professional well-being. The theoretical framework for burnout was partially derived from the practices of dehumanization, and caring detachment prevalent in the medical field as a means of coping with the stressors of treating the ill. The MMBT also extends to the other end of the continuum. Burnout has an opposite known as engagement, which consists of vigor, involvement, and dedication. Consideration of the burnout-engagement continuum can provide insights into the organizational factors that contribute to experiences of both extremes. The organizational factors that contribute to one or the other may also be used as a template for the prevention of burnout or the development of engagement.

In considering specific organizational factors that contribute to burnout, the MMBT includes the major areas of job-person mismatch. These areas include workload, control, reward, community, fairness, and values. When these areas are in conflict (i.e., mismatch), there is a probability of burnout occurring (Maslach, 1998). The greater the gap between the domain and the individual's requirements, the greater is the increased risk of burnout occurring.

Stress and burnout are commonly treated synonymously throughout the literature, perhaps because high levels of chronic stress develop into one or more of the dimensions of burnout observed by Maslach (1996). It could also be the result of burnout not actually having a definition. An understanding of the relationship between teacher stress and teacher burnout is central to understanding how stress develops into burnout. Burnout is a psychological syndrome that results from long-term unrelieved occupational stress

(Maslach, 1996). Both burnout and stress are negative responses to occupational stressors, but they have different antecedents, correlates, and consequences (Beausaert et al., 2016; Froehlich et al., 2016; Chirico, 2016). Despite the integral link between burnout and stress, they are nonetheless completely different phenomena.

Teacher stress and burnout has been researched in countries throughout the world and determined to be a major problem for educational systems globally (Collie et al., 2017). Teaching has often been demonstrated to be among the most stress inducing professions (Collie et al., 2017). There are three major perspectives for defining and conceptualizing stress in teachers: (a) the first views stress in terms of pressure or demands teachers experience in the workplace, (b) the second involves the affective and behavioral responses specific to teaching, and (c) the third views stress as the degree of balance between demands in the workplace and the available resources for addressing these (Collie et al., 2017). Research has also been focused on stress-related constructs such as emotional exhaustion and well-being. Emotional exhaustion is one of the major components of burnout and refers to feelings of emotional fatigue and depletion of emotional resources (Maslach et al., 2001). The most relevant is emotional exhaustion, which represents the stress dimension of burnout (Maslach et al., 2001). Work related well-being is satisfaction with and healthy functioning in a professional capacity and is negatively associated with educator stress and positively associated with engagement (Collie et al., 2015).

There are three critical factors that that are prevalent in teacher stress and well-being: (a) leadership support, specifically support of teacher autonomy, (b) positive

relationships within the school community, including those with leadership, colleagues, and students, and (c) the impact of educational policy including testing, innovations, and accountability (Van Droogenbroeck et al.,2014). Support provided by school leaders and positive collegial relations in the school have a major influence on the impact of the stress that results in teachers from student misbehavior and educational policy mandates (Collie et al., 2017; Van Droogenbroeck et al., 2014). In addition, teachers' perceptions of occupational support from both leaders and colleagues serves as a buffer between them and the perceived demands of the job. Standardized testing and educational innovations may be perceived by teachers as a job demand or a job resource. These three factors address the key environmental and organizational sources of teacher stress that are central components of organizational models of well-being. Teacher perceptions of adequate school and systems-based support result in lower stress and higher levels of well-being in their work (Collie et al., 2017).

Work life theory is an integral extension of MMBT and provides greater clarity on the development of burnout in response to environmental factors. Numerous personal and environmental factors play into the development of job burnout, which Maslach and Leiter (1997, 2016) attempted to respond to by developing a model that targeted the degree of match, or mismatch, between the individual and six major areas of work life that envelop the central relationships with burnout: workload, control, reward, community, fairness, and values. The mismatches result in burnout, which manifest in various outcomes whereas matches result in engagement. This model has helped to

generate order among a wide variety of environmental-situational correlates (Maslach et al., 2001; McFadden et al., 2018).

Workload mismatch generally exists when excessive demands deplete an individual's energy to the degree that recouping it at sufficient levels becomes impossible. The wrong kind of work may also result in workload mismatch in situations where an individual possesses deficient skills or interest in a specific type of work that is required to perform a job. When a job requires that an individual express emotion that is not genuine, it can be particularly challenging and result in emotional exhaustion. Generally, workload mismatch has a direct impact on the emotional exhaustion component of burnout (Maslach et al., 2001; McFadden et al., 2018).

Mismatches in control most often result from insufficient control over resources or insufficient authority to work according to what they consider best practice. Control issues generally result in the reduced personal accomplishment component of burnout (Maslach et al., 2001; McFadden et al., 2018). Reward mismatches result from inadequate rewards or recognition for the work performed by the individual. This could involve insufficient financial rewards, such as low salary or inadequate benefits, or insufficient recognition or appreciation by others. This results in devaluing both the work and the workers (Maslach et al., 2001; McFadden et al., 2018).

The fourth type of mismatch occurs when the perception of belonging to a community is lacking in the work environment. Individuals tend to flourish when they perceive themselves to be part of a community and function optimally when they participate in aspects of their job experience with coworkers in an atmosphere of mutual

respect. In addition to providing emotional support, this type of social support affirms a person's belonging to a group with a shared value system. This type of mismatch results in exhaustion and depersonalization (Maslach et al., 2001; McFadden et al., 2018).

The perception of unfairness in the workplace results in a critical person-job mismatch. A lack of fairness in the workplace conveys disrespect to individuals and diminishes their sense of self-worth. Mutual respect between professionals is at the core of the development of a collaborative community. Unfairness most often results from unequal workloads or significant disparities in compensation, cheating, or bias in evaluations and promotions. This results in exhaustion and in depersonalization-cynicism (Maslach et al., 2001; McFadden et al., 2018).

The sixth area of mismatch involves conflicts between the values of the individual and the organization. This type of mismatch occurs when individuals feel pressured to perform tasks that they consider unethical or that violate their personal values. An example would be a job or employer that requires the employee to lie or deceive to achieve organizational goals. Mismatches between individual career goals and organizational values can also result in burnout. Another common source of value conflict mismatch is in organizations where major discrepancies exist between the mission statement and actual intraorganizational practices. Philosophical disparities between the organization and the individual can also result in such values conflicts (Maslach et al., 2001; McFadden et al., 2018).

Multiple individual and organizational factors are involved in the development of burnout, and research in the area continues to attempt to define the relationships between

the major work life factors and the three dimensions of burnout (Maslach et al., 2001; McFadden et al., 2018). The work life theory is the most comprehensive available to decode the relationships. It provides a theoretical framework that attempts to integrate both individual and organizational factors, rather than assessing their potency in isolation. This model proposes that burnout stems from long-term mismatches between individuals and their job situation in terms of some or all these six areas (Maslach et al., 2001; McFadden et al., 2018).

An employee's psychological relationship with his or her job has been conceptualized as a state on the fluctuating continuum between the negative experience of burnout and the positive experience of engagement (Leiter & Maslach, 2004). This theory maintains the importance of viewing the individual in context, in terms of alignment with the major domains of work life (Leiter & Maslach, 2004; Maslach, 2017). More recent studies support the position that certain aspects of personality can affect stress levels and result in stress-related disorders such as burnout or provide greater resiliency against stress and its outcomes (Langelaan et al., 2006; Mojsa-Kaja et al., 2015). Teachers may potentially experience mismatches in all six of these work life areas, mismatches in the areas of control and a sense of community most closely relate to the independent variables, autonomy, and supportive leadership, which are the focus of this study.

The Leiter Model

The Leiter Model extends the MMBT even further by describing the developmental pathway of burnout (Leiter, 1989). The development of the burnout

phenomenon has been theorized to occur in distinctively different sequences, but the

Leiter model, which places emotional exhaustion in a central position, associating it with

the depersonalization and personal efficacy, seems to be the most appropriate for

education professionals because of the excessive number of emotionally exhaustive

factors they confront, and their association with the other constructs (Leiter, 1989).

Exhaustion results primarily from mismatches in workload and job control because of the

excessive demands both placed on the teacher because of the anxiety they induce

(Maslach & Leiter, 2008). A manageable workload results in sustainable energy levels

while reducing the risk of burnout. Work overload is a major contributor to exhaustion

and often results in burnout as it serves as the primary stress component (Karasek &

Thorell, 1990). The source of work overload is commonly associated with insufficient job

control, which limits the perception of autonomy and the discretion necessary to make

regulatory decisions regarding their workload (Portoghese et al., 2014). The prevalence

of job control (autonomy) is a major contributing factor in determining the development

of burnout or engagement in the work environment. Sufficient autonomy enables

professionals to shape their work environments creating a balanced manageable workload

(Maslach & Leiter, 2003).

Self-Determination Theory

Self-determination theory (STD) is one of the most prominent human motivation

and personality theories that considers both innate growth tendencies as well as

fundamental psychological needs (Hagger & Chatzisarantis, 2016; Ryan & Deci, 2000).

It is concerned with the type of motivation involved in choices made independent of

external influence and interference. The focus of SDT is the degree of self-motivated and self-determined behavior generated within individuals (Deci & Ryan 1991; 1995; Deci & Ryan, 2012; Ryan & Deci, 2017). Studies conducted by Deci and Ryan (1991; 1995) investigated the two major types of human motivation: intrinsic and extrinsic, and identified three innate psychological needs that guide self-determining behaviors. These three fundamental psychological needs that are essential in supporting the process of intrinsic and optimal well-being are: (a) competence (the need to feel able to achieve goals); (b) relatedness, the need to be understood by, to care for, and be cared for by others); and (c) autonomy (the freedom to direct one's life through internally generated choices) (Ryan & Deci, 2000).

Self-determination theory emerged from studies performed in the 1970's on intrinsic and extrinsic motivation and that helped to define the role of intrinsic motivation in individual human behavior (e.g., Deci, 1971). Intrinsic motivation involves the initiation of a behavior or activity for its inherent value, because it is interesting and innately rewarding rather than for an external reward, extrinsic motivation (Ryan, 1995). It was not until the mid-1980's that SDT had been thoroughly tested and became an accepted empirical theory. Motivation can be categorized based on the degree of internalization. Internalization occurs when an extrinsic motive is transformed into the domain of personally endorsed values with the assimilation of the associated behavioral controls that were once external (Ryan, 1995). The three fundamental principles of SDT are: a) humans are innately driven to achieve mastery of emotions; b) humans possess an inherent propensity towards growth and integrated functioning; and c) optimal

development and actions are inherent in humans but they don't happen automatically

(Deci & Vansteenkiste, 2004). In the context of this study, the primary focus is the

importance of autonomy as an organizational factor that contributes positively to teacher

engagement and negatively to burnout. It is notable that SDT closely parallels the basic

tenets of Montessori psychology in its proposition of underlying innate mechanisms that

control positive human development in the presence of required environmental conditions

(Deci & Vansteenkiste, 2004; Montessori, 2010; Montessori, 2016).

      According to self-determination theory, if the three innate needs of competence,

relatedness, and autonomy are satisfied, individuals will experience optimal function and

growth (Deci & Vansteenkiste, 2004). These needs are innate, universal necessities to all

humans across time, gender, and culture (Deci & Vansteenkiste, 2004). For their inherent

potential to be realized, individuals require nurturing from the social environment. Well-

being and growth occur if the environmental needs of the individual are provided, if they

are not met negative outcomes are likely to result. This theory posits a natural tendency

of growth toward positive innate motivation that can be hindered if basic needs are not

met (Deci & Vansteenkiste, 2004).

      Self-determination theory defines autonomy as a fundamental universal

psychological need that is essential for optimal motivation and psychological well-being

(Deci & Ryan, 2000; Gagne & Deci, 2005). Self-determination theory posits that

satisfaction of this basic need promotes intrinsic motivation; the perception of autonomy

aids in the maintenance of intrinsic motivation (Gagne & Deci, 2005). According to the

basic tenets of SDT, it should be expected that perceived autonomy in teachers would be

a significant predictor of engagement and job satisfaction. According to the results of studies conducted by Skaalvik and Skaalvik (2009; 2014) autonomy and supportive leadership resulted in higher levels of teacher intrinsic motivation and were significant positive predictors of teacher engagement. Some degree of autonomy is required by teaching professionals to effectively deal with unexpected situations, and in the case of Montessori teachers, autonomy is required to respond to developmental cues with spontaneous curriculum development within the defined pedagogical framework (AMS, 2018).

The basic psychological need of relatedness is defined by SDT as the need to care for and to be cared for by others as well as to share a sense of belongingness to others in the community (Deci & Vansteenkiste, 2004). Much emphasis is being placed on supporting the psychological needs of students in the schools, primarily through teacher endeavors to establish needs-supportive classrooms, however, there is the prerequisite of first satisfying the psychological needs of the teacher (Marshik et al., 2017; Ryan et al., 2017). It is now recognized from the results of several SDT studies involving teachers and their students, that teachers psychological needs affect their capacity to address the needs of their students as well as their personal wellbeing and growth as individuals (Marshik et al.; Pelletier & Sharp, 2009; Roth et al., 2007). School leadership is a critical factor in establishing the atmosphere of the school and plays the most influential role in determining the degree to which the psychological needs of teachers are met within the schools (Berkovich & Eyal, 2017).

In a study on factors influencing early career teachers, Hobson and Maxwell (2017) found that relatedness was the most prevalent factor influencing the wellbeing of early career teachers. Relatedness was displayed through positive relationships with students, colleagues, mentors, and principals as well as through the development of friendships (Hobson & Maxwell, 2017). In a longitudinal study involving 10,395 third grade students and their teachers, it was found that students were significantly more motivated and achieve at a higher level if their basic psychological needs were adequately addressed (Marshik et al., 2017). However, they found that teachers whose psychological needs were not being met, exerted a negative influence on the needs satisfaction and achievement of their students. This study also found that teachers who experienced a sense of autonomy in teaching had students who achieved significantly higher standardized reading assessment scores across the reading subskill areas (Marshik et al., 2017).

Numerous research studies have indicated that students at all grade levels put more effort into their schoolwork, are more engaged, are intrinsically motivated, and achieve more academically when they perceive that their teachers care about them and try to understand them (Jaber et al., 2018; Roorda et al., 2019; Warren, 2018; Wang & Degol, 2016). The basic premise of self-determination theory suggests that when teachers' needs for relatedness are met, they are more likely to establish friendly and supportive learning environments informed by understanding of their students' needs (Marshik et al., 2017). Research findings demonstrated that how teachers' perceived pressure and support in the school significantly predicted their level of motivation,

efficacy, and sense of wellbeing, which have been found to influence their student outcomes, teaching success, pedagogy, self-image, and the level of support provided to their students (Bradshaw et al., 2019; Cohen et al., 2019; Daniels et al., 2018; Erkutlu & Chafra, 2016; Gagne et al., 2018; Liu et al., 2019; Marshik et al., 2017). Furthermore, the lack of supportive school leadership has been associated with higher levels of teacher stress, reduced motivation, job satisfaction, and commitment to teaching (Adnot et al., 2017; Banerjee et al., 2017; Feng & Sass, 2017). Ultimately, teachers who perceive themselves to be supported and valued by their school leaders are more likely to be intrinsically motivated to teach in a manner that implements effective pedagogical practices, resulting in higher levels of student achievement.

Transformational Leadership Theory

Transformational leadership is an approach to leadership that emphasizes creating beneficial changes in followers through inspiration (Bass, 1990). James Burns introduced the concepts of transformational leadership after studying political leadership, it was later applied to organizations (Bass, 1990). Bass (1990) added to the work of Burns by explaining the psychological mechanisms that underlie transformational and transactional leadership. Bass' theory established the four factors demonstrated by transformational leaders: individual consideration, intellectual stimulation, inspirational motivation (charismatic leadership), and idealized influence. Transformational leadership is a tested and effective method for improving school outcomes (Windlinger et al., 2020). Leaders who implement one or more of the four dimensions of transformational leadership (idealized influence, inspirational motivation, intellectual

stimulation, or individualized consideration), into their supervisory methods, experience

significant results related to the prevention and mitigation of burnout (Hildenbrand et al.,

2018).

　　　　Despite the complexity of the development and mitigation of teacher burnout,

leadership quality stands out as one of the most prevalent contributing factors, if not the

most prevalent, and clearly must be remedied for the problem to be adequately addressed

(Denmark, 2012; Player et al., 2017; Smith, 2016; Thibodeaux et al., 2015). Leadership

which does not address the needs of the faculty, staff and school community is a

prevalent complaint among former and current teachers (Balyer, 2012). Transformational

leadership is a form of leadership that seeks to inspire and empower faculty and staff to

achieve success, by setting a vision, and instilling trust, confidence, and pride in the

school, while providing intellectual stimulation which are required elements for a

successful school environment (Smith, 2016). It is not necessary that school leaders train

specifically in transformational leadership but that they implement the components that

best meet the needs of their schools (Ford & Ware, 2018). The collaborative nature of

transformational leadership results in collective empowerment of faculty, staff, students,

and the extended school community (Smith, 2016). As a result of its implementation, the

school is transformed into a dynamic entity bringing about change even within the

challenging bureaucratic, politically charged environment of today's public schools

(Smith, 2016). The research on transformational leadership suggests that it is a powerful

and effective model when implemented in school environments with the potential to

increase retention in its capacity to address and remedy many of the leadership-centered

factors that contribute most significantly to teacher burnout and attrition (Player et al., 2017; Smith, 2016; Thibodeaux et al., 2015).

Supportive leadership can include any number of resources such as additional planning time, professional development opportunities, professional mentoring, greater autonomy, decision making opportunities, collaboration with colleagues, emotional, moral, and instructional support, provided by school leaders to teachers (Brown & Wynn, 2009; Hughes et al., 2015; Lambersky, 2016; Olsen, 2017). Efforts made in any of these areas may have beneficial results for teachers. Studies conducted on supportive leadership behaviors demonstrate how supportive school leadership can affect motivation, wellbeing, and greater efficacy in teachers (Dou et al., 2017; Dou et al., 2019; Eyal & Roth, 2011). The effects of transformational leadership behavior on school conditions which support teaching and learning have demonstrated the beneficial effects of this model in the schools (Hallinger et al., 2018; Leithwood & Sun, 2012; Sun & Leithwood, 2017). In another study, Leithwood and Sun (2012) evaluated numerous effective models of school leadership including transformational leadership. They discovered that many of the more effective leadership models contained the same general elements that resulted in positive school outcomes (Leithwood and Sun, 2012). Thus, they advocated that school leaders consider implementing specific evidence-based practices to support their staffs rather than total models (Leithwood & Sun, 2012). In another study, Sun and Leithwood (2012) performed a metanalysis across several reviews on the effects of transformational school leadership on student achievement. They found that transformational leadership had significant positive effects on five different types of

student outcomes—achievement, attendance, college-going rates, dropout rates, and graduation rates (Sun & Leithwood, 2012).

The central role of school leaders in affecting teacher wellbeing, professional efficacy, and improving student outcomes is well known because of the multiple studies (Abos et al., 2018; Berkovich & Eyal, 2017; Ford et al., 2019; Thomas et al., 2020). Training school leaders in leadership practices that provide them with the knowledge and skills that will enable them to establish conditions in the schools that support teachers and improve student achievement is the indicated approach (Ford & Ware, 2018).

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Montessori vs Traditional Education Models

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Educational Worldviews

The differences between Montessori and traditional methods of education go far beyond the characteristics readily observable in both types of classrooms; they are extreme to the point of being nearly opposite. Montessori is characterized by mixed age groups in a classroom, the freedom to choose work, to explore, and to make mistakes, a natural environment, uninterrupted concentration, small group instruction, uninterrupted work periods, beauty, quality and creativity in work, a scientifically/developmentally appropriate prepared environment, a sense of and value for community, a respect for children's abilities, and a focus on teacher self-awareness (Lide, 2018). Traditional education is characterized by assignments from teachers, single age groups, no freedom to choose work, limited movement and talking, limited exploration of interests, fear of making mistakes, a desk and chalkboard environment, scheduled interruptions, and whole

class instruction (Lide, 2018). Underlying these obvious characteristics is a philosophy, a worldview that is the essence of the two classes of education (see Table 1).

The traditional K-12 classroom has been designed according to the mechanical worldview, which includes linearity, hierarchy, reductionism, objectivity, outcomes, and empiricism (Lide, 2018). With the evolution of a participatory worldview, a totally different value system is arising in human society to replace the old. A high-fidelity Montessori environment integrates these arising characteristics. The core of the Montessori method of education emerged from a non-linear model based on sound developmental principles. Montessori education is not circumscribed by mechanistic cognitive development, but integrates a holistic multifaceted view of human development, rendering it more closely aligned with the tenets of the participatory than with the mechanical worldview (Lide, 2018).

The implementation of Montessori in the public schools has resulted in major struggles between these two worldviews. This is less of an issue in the private sector, than in the public, because of the accountability concerns precipitating the effort to control public school curriculum and test preparation creating threats to required teacher autonomy and impacting the ability of school leaders to support teachers in general, and in relation to autonomy specifically (NCES, 1997; NCES, 2015). The central tenet of Montessori requires that the teacher spontaneously develop individualized curriculum based on the observed needs of the child within a proven pedagogical framework (Montessori, 2016). This requires near total autonomy of the teacher stemming from respect for the professional capacity of the teacher. Over 50% of Montessori school

leaders in the public sector lack any formal Montessori training and are thus not qualified to provide curricular guidance to Montessori teachers (Montessori in the Public Sector, 2018). They have only the option of supporting the teacher in non-curricular matters. Many non-Montessori school leaders direct Montessori teachers towards traditional curriculum as it is their primary pedagogical resource (Montessori in the Public Sector, 2018).

The level of autonomy afforded to Montessori teachers as a requirement of integral implementation of the pedagogy, together with the leader support of this required autonomy, provide for two basic human needs of Montessori teachers that are not standard traditional teacher experiences, as they are neither essential nor beneficial by the standards of the underlying traditional worldview. The freedom allowed the child in a Montessori classroom, which is a central tenet of Montessori, is extended to and from the teacher who provides the options to the child for this freedom through the prepared environment as well as through the spontaneously generated prompts (lessons) that result from observations of and interactions with individual children (Montessori, 2016). It is essential that this requirement for autonomy is supported by the school leaders as it is an integral aspect of Montessori pedagogy required for integrity of the method and addressing inequalities between children from diverse backgrounds (Steiner, 2016). Both autonomy and support by school leaders are also factors known to prevent burnout and contribute to engagement (Greenberg et al., 2016; Skaalvik & Skaalvik, 2014).

Table 1

Differences in Montessori and Traditional Educational Worldviews

Montessori Education	Traditional Education
Supports the natural development of the child.	Supports the transfer of the standardized curriculum.
Children learn at their own pace and follow their own individual interests	Children learn from a set curriculum according to a time frame that is the same for everyone
Children learn from self-correcting materials, one another, and the teacher	Children are taught by the teacher
Child is an active participant in learning	Child is a passive participant in learning
Understanding comes through the child's own experiences via the materials and the promotion of children's ability to find things out for themselves	Learning is based on subjects and is limited to what is given
Learning is based on the link between physical exploration and cognition	Children sit at desks and learn from a whiteboard and worksheets
Child can work where he/she is comfortable, move around and talk at will while not disturbing others	Child is usually assigned own chair and encouraged to sit still and listen during group sessions
The teacher works in collaboration with the children	The class is teacher led
The child's individual development brings its own reward and therefore motivation	Motivation is achieved by a system of reward and punishment
Environment and method encourage internal self-discipline	Teacher acts as primary enforcer of external discipline
Child works for as long as desired on chosen project	Child generally given specific time limit for prescribed work
Uninterrupted work cycles	Block time, period lessons
Mixed age groups	Same age groups
Working and learning matched to the social development of the child	Working and learning without emphasis on the social development of the child
Shared emphasis on intellectual, social, emotional and spiritual development	Main emphasis on intellectual development
Shared focus on the acquisition of academic, social, practical and life skills	Focus is on academics

Montessori Educational Outcomes

The evidence on the effectiveness of Montessori vs traditional methods of education is not extensive but some studies have been performed. In a 2017 review of evaluative Montessori education studies, significant evidence was found indicating that specific components of the Montessori method, including teaching early literacy via phonics grounded in a rich language context, and teaching mathematics through a sensorial approach have been effective (Marshall, 2017). This was demonstrated by children in high-fidelity Montessori schools (adhere to the tenets of Montessori education), scoring significantly higher scores on standardized tests in reading, math, and vocabulary than their counterparts from two other types of school (traditional and low fidelity Montessori) (Goldacre, 2013; Marshall, 2017). It was also concluded that while some evidence exists regarding the cognitive and social benefits of a high-fidelity Montessori education (adheres to the tenets of Montessori education) it appears that this does not extend to adapted Montessori educational approaches (Goldacre, 2013; Lillard, 2017).

One thousand and thirty-five (1,035) students from an urban public-school district in Texas participated in a study that measured and compared the academic achievement of Montessori and non-Montessori students (Mallett & Schroeder, 2018). The Iowa Test of Basic Skills and the Texas Assessment of Knowledge and Skills (TAKS) were used to measure reading and mathematics skills (Mallett & Schroeder, 2018). Of the 1,035 participants, 518 were Montessori students and 517 were non-Montessori students. The

Iowa Tests of Basic Skills total reading and total math scores in grades one, two, and three did not indicate significant differences between the two groups. However, the TAKS reading, and math scores were statistically higher for Montessori students in the upper elementary grades than for the non-Montessori cohort (Mallett & Schroeder, 2018). Possible implications of these study results are that the gap between the academic achievement of Montessori and traditional students widens in favor of Montessori students with increased years in the Montessori classroom. The results suggested that the benefits of Montessori education on academic achievement possibly results from a cumulative effect.

In a study comparing approximately 290 demographically matched Montessori and traditional middle school students examining the use of time and how they perceived their schools, teachers, and friends, Montessori students had more positive perceptions of their school environment and their teachers, and mostly perceived their classmates as friends while at school (Rathunde & Csikszentmihalyi, 2005). Montessori students also were engaged for significantly longer periods with school-related tasks, chores, collaborative work, and individual projects; and traditional students engaged in significantly more social and leisure activities and in teacher controlled educational settings (Rathunde & Csikszentmihalyi, 2005).

In a study comparing children at a public inner-city Montessori school to non-Montessori counterparts, it was found that Montessori students had significantly more positive academic outcomes. The Montessori children scored significantly higher on standardized reading and math assessments, engaged more positively with one another

during recess, and exhibited significantly higher levels of social cognition and executive

control (Lillard & Else-Quest, 2006). They also demonstrated a greater value for fairness

and justice. When evaluated at the completion of elementary school, Montessori students

were more adept at writing creative essays, used highly complex sentence structures,

exhibited prosocial responses to conflict, and perceived more of a sense of community

within their schools (Lillard & Else-Quest, 2006).

Ervin, Wash, and Mecca (2010) performed a three-year study of 256 K-2

Montessori and traditional students in a public-school program in South Carolina. Self-

regulation and academic performance were measured, and results demonstrated that

Montessori children had significantly higher levels of self-regulation and their scores on

the Measure of Academic Progress tests indicated significantly higher means in both

reading and math (Ervin et al., 2010).

A longitudinal study conducted in the Milwaukee public schools demonstrated

that students who had attended Montessori preschool through grade 6, scored

significantly higher than their high school classmates on standardized mathematics and

science assessments (Lindenfors, 2007). Another study found that Montessori high school

students exhibited significantly higher achievement levels than non-Montessori students

across all major areas of curriculum evaluated (Dohrmann et al, 2007).

Several studies have not found significant differences in academic achievement

between Montessori and traditional students. This is likely the result of low degrees of

integrity in the implementation of the method. An example is a study conducted in a

Buffalo, New York public Montessori magnet school. The results of this study indicated

that there was no difference in levels of academic achievement between Montessori and traditional students (Lopato, et al., 2005). When Montessori is abandoned to any degree in favor of the traditional approach, the benefits diminish. Lillard (2012) found that the most positive student outcomes occur in classic high-fidelity Montessori classrooms where more time is spent engaging with Montessori materials, as compared to classrooms where less time is spent engaging with the Montessori materials, or no time at all is spent engaging with the materials.

The data collected by the East Dallas Community School (EDCS, 2010) over the last 30 years indicated the benefits that public Montessori programs potentially extend to students' years after they complete the program. EDCS is an award-winning AMI Montessori charter school in Dallas, Texas that provides primary and elementary Montessori for an economically disadvantaged community with varied racial minorities for whom English is a second language (EDCS, 2010). In this community there has traditionally been a less than 50% high school graduation rate. The children who attended the AMI school from preschool through elementary had a 94% high school graduation rate and an 88% college admission rate which were significantly higher than the Texas means. They also had nationally normed reading and math scores in the upper 30 percentile range and TAKS scores considerably above the state mean (EDCS, 2010). The data from the EDCS is an indication of the long-term effects of a high-fidelity Montessori education at the early childhood level.

Traditional Educational Outcomes

There are numerous indicators that can be considered when evaluating the United States traditional K-12 education system. National assessment data, graduation rates, teacher retention data and international comparative assessment data can provide a partial assessment of the functioning of the system. Of the 50.8 million public K-12 students in the United States, less than 1% (.25%) are Montessori students (Montessori in the Public Sector, 2020; NCES, 2019). The national public-school assessment data may include Montessori public school student data as well.

Comparing multiple education systems throughout the world on assessment scores in core subject areas is one method for gauging traditional student outcomes by using the results from such tests as the Programme for International Student Assessment (PISA) (Hopfenbeck, 2016). The PISA was created by the Organization for Economic Co-operation and Development (OECD), an initiative that has now surpassed earlier efforts in influence at comparative international education (OECD, 2018). The 2015 PISA results indicate that US students rank around average in comparison to their peers around the world. The US ranked below average in mathematics and around the average range in science and reading (OECD, 2018). There has been little change in these rankings since the first PISA scores were made available in 2000 (OECD, 2018). In another international assessment, Trends in International Mathematics and Science Study, American 4th grade students experienced a decline in math scores between 2011 and 2015, 8th grade math scores rose a statistically significant amount, and 4th and 8th grade

science scores rose slightly. Compared to 47 other countries, the US ranked 14th for average scores (NCES, 2017).

According to the national center for education statistics (NCES, 2018) in school year 2016–17, the adjusted cohort graduation rate (ACGR) for public high school students was 85 percent, the highest it has been since the rate was first measured in 2010–11. Asian/Pacific Islander students had the highest ACGR (91 percent), followed by White (89 percent), Hispanic (80 percent), Black (78 percent), and American Indian/Alaska Native (72 percent) students (NCES, 2018).

The National Assessment of Educational Progress scores are used to generate the Nations Report Card (NCES, 2019). It tests 4th, 8th, and 12th grade nonpublic and public-school students in all subject areas (NCES, 2019). The 4th grade results showed a decline in 2017 reading scores of 5 percentile points from 1992-2015 with math and science scores unchanged for the same period. Math scores increased 6 percentile points over the same period for 8th grade and 5 percentile points for 12th grade. Reading scores for 8th and 12th grade increased 4 percentile points and 12th grade science increased by 2 percentile points with 8th grade science unchanged. In mathematics, the percent of students scoring at or above basic level were 82%, 71%, and 62%, for grades 4, 8, and 12 respectively (NCES, 2018). In reading, the percent of students scoring at or above basic were 69%, 76%, and 72%, and in science 76%, 68%, and 60% (NCES, 2018). These scores are from both public and nonpublic school students combined. When public school only scores are considered, mathematics was 81%, 70%, and 60%; reading: 68%, 75%, and 71%; and science 75%, 67%, and 59%. Considering only public-school scores: 32% of 4th grade

students, 25% of 8th graders, and 29% of 12th graders were below basic in reading. In mathematics 19% of 4th graders, 30% of 8th, and 40% of 12th graders were below basic skill levels. These indicators provided some insights into the overall effectiveness of public-school programs in teaching basic academic skills.

If the United States was on par with Singapore or China as far as PISA test scores, it may not solve the primary problem in our education system: stressed, burnt-out teachers with a high likelihood of leaving the profession. The high performing Asian countries including China, Singapore, and Japan are not constructivist in their approach to education. They have adopted the Euro-American factory model of education and enhanced it with a touch of nationalism and intense behavior modification (Deng & Gopinathan, 2016). These countries have selected their teachers from the top of their classes and focused significant resources on their foundational and continuing education and have committed a major patriotic effort to prepare for and score high on the international tests (Deng & Gopinathan, 2016).

Consideration should be given to indicators other than test scores and graduation rates in evaluating an education system (Busteed, 2013). Attrition rates of teachers, stress levels of educators, and burnout among teachers and students, engagement levels of students, their desire to attend school, their enthusiasm over projects or other school activities may yield more positive results (Busteed, 2013). Consideration of such additional factors may also be an inroad for a more intense multi-level examination of the United States education system.

Teacher attrition rates in the United States are twice (8%) the international average (4%). Even though over $11,000 average per student per academic year is spent, we have serious problems that are not being solved by increasing education spending. There is a serious teacher shortage, or an inability to staff schools at current salary levels with individuals qualified to teach in the required subject areas, that is projected to become more intense (Carver-Thomas & Darling-Hammond, 2017; Sutcher et al., 2016). The United States is also faced with a crisis of disengagement in the schools. Teachers and their students are both disengaged. Schools are places where students of all ages do not want to be, resulting in dropouts at the secondary level, stress and burnout at all levels, dissociation, behavior problems, deficient skill development and so on (Busteed, 2013).

Disengagement can be viewed as a measure of the effect of the schools on the teachers and the students. Perhaps, this is a more accurate and holistic measure for assessing the state of a school system. A Gallup Student Poll surveyed nearly 500,000 students in grades 5-12 who attended over 1,700 public schools in 37 states (Busteed, 2013). The survey found that approximately 8 in 10 of the participating elementary students were engaged at school. There was a decline to 6 in 10 students at the middle school level, and <4 in 10 students were engaged by high school (Busteed, 2013). Of the 1700 public schools surveyed, the highest performing high schools only had engagement levels of 7 in 10. If you add the numbers of disengaged teachers, about 57%, of full-time K-12 teachers in the U.S. are not engaged, with about 13% rating themselves as actively disengaged to the numbers of disengaged students, there is a

severe educational crisis that needs to be addressed in such a manner that the focus is on teachers becoming excited about teaching and students excited about learning rather than pointless scores on meaningless tests as the test scores will logically increase with engagement (Hastings & Agrawal, 2015).

Jang, Kim, and Marshall, (2016) studied 366 secondary students, implementing a self-determination theory framework to assess student engagement vs disengagement. Perceived autonomy support, perceived teacher control, need satisfaction, need frustration, engagement, and disengagement measures were collected (Jang et al., 2016). Using multi-level structural equation modeling analyses the authors determined that perceived autonomy support significantly predicted changes in need satisfaction which significantly predicted changes in engagement; and perceived teacher control significantly predicted changes in need frustration which significantly predicted changes in disengagement (Jang et al., 2016). Disengagement significantly predicted both increases in students' perceptions of teacher control and decreases in perceptions of teacher autonomy support (Jang et al., 2016). Students responded with engagement when they perceived their teachers to be autonomy supportive and need satisfying. They responded with disengagement when they perceived their teachers to be controlling and need frustrating (Jang et al., 2016).

Autonomy-supportive teaching which involves an interpersonal tone of support and understanding from the teacher, increases students' positive classroom functioning, resulting in greater engagement. It does this because it nurtures and supports the basic psychological needs for autonomy, competence, and relatedness (Deci, 2000). The

primary reason students show robust classroom engagement is because they first experience engagement-energizing psychological need satisfaction as a result of teacher implementation of an autonomy-supportive instructional approach (Cheon & Reeve, 2013; Cheon et al., 2012; Jang et al., 2012).

Factors Related to Teacher Burnout

From the multiple factors at both the personal and organizational levels that result in teacher stress and burnout, the lack of supportive leadership and autonomy are among the most prevalent factors (Greenberg et al., 2016). According to Denmark (2012), more teachers leave the profession because of their perception of non-supportive leadership than for any other reason. Multiple studies have demonstrated that the relationship between the transformational leadership style of elementary school leaders and teacher stress and burnout is statistically significant (Bass et al., 2016; Cansoy, 2019; Lambersky, 2016; Osunka & Unachukwu, 2020; Oullette. et al. 2018). Sosik and Godshalk (2000) studied the leadership styles (transformational, transactional, and laissez-faire) used by leaders in elementary schools to determine specific leader functions or tasks associated with teacher stress-burnout. They found that transformational leadership behaviors were significantly related to reduced stress and burnout levels and increased job and task satisfaction levels among teachers (Sosik & Godshalk, 2000). The authors also noted that implementing transformational leadership behaviors resulted in stronger emotional bonds between school leaders and teachers.

In a multi professions meta-analysis of 157 studies (that included multiple studies with teachers) on the associations of leadership style on burnout and stress, it was found

that transformational leadership was significantly negatively associated with both stress and burnout in employees (Harms et al., 2017). Transformational leadership was also found to be moderately negatively associated with each of the three dimensions of burnout (Harms et al., 2017). Similarly, Hetland et al., (2007) studied the relationships between stress and burnout and leadership style in a sample of employees. This study found that leaders demonstrating transformational leadership qualities had employees with significantly lower stress and burnout levels. However, employees of leaders with laissez-faire or passive-avoidant styles had significantly higher levels of stress and burnout (Hetland et al., 2007).

Gong, Zimmerli, and Hoffer (2013) examined the relationship between transformational leadership practices of school leaders and the sense of calling on job burnout among 256 special education teachers. The results indicated that transformational leadership was significantly negatively related to the emotional exhaustion and depersonalization subscales and significantly positively related to the personal accomplishment construct. The study also discovered that the relationship between transformational leadership and teachers' burnout was likely mediated by a sense of calling. These findings suggest that the influence of transformational leadership on burnout may result from both direct affects and the indirect influence of mediators experienced by teachers in their specific school environments (Gong et al., 2013).

Teacher autonomy, like supportive leadership is one of the most prevalent factors contributing to burnout-engagement among teachers. However, autonomy is also a fundamental universal psychological need that is essential in all professions if

engagement is to be achieved (Gagne, 2014). It is also one of the major characteristics of

Montessori pedagogy that defines the method and is central to the child-centered

educational philosophy (Montessori, 2016). Though autonomy is not considered essential

to traditional pedagogy, other than a minimal degree to allow the teacher to deal with

spontaneous situations, it may be essential for engagement to occur. Skaalvik and

Skaalvik (2014) performed a study involving 2,569 elementary and middle school

teachers to determine if teacher self-efficacy and teacher autonomy are independently

associated with engagement, job satisfaction, and emotional exhaustion. They found that

the perception of autonomy was an independent predictor of both engagement, and

burnout depending on the level of decision latitude allowed and encouraged within the

school environment (Skaalvik & Skaalvik, 2014).

      Teacher power struggles with prescribed curriculum are a major factor in the case

of attrition of more experienced competent teachers. Creating curriculum and approaches

that yield success for teachers and students is discouraged and teachers with more

experience tend to be less compliant than less experienced teachers (Kaufmann, 2005).

This lack of autonomy in teaching is a primary reason for teachers burning out and

leaving the profession after many years of experience (Parker, 2015). According to Black

and Deci (2000), autonomous behaviors have an internally perceived locus of causality,

are experienced as self-willed and are performed from a perspective of personal value

and importance. For dedicated teachers, little is of greater inner value than identifying

what materials and methods work best with students which is what lies at the core of the

powerful influence that diminished autonomy has on burnout and attrition. Scripted

mandated curriculum is perceived by experienced teachers as the factory model of education that uses organizationally prescribed pacing, that ignores critical contextual factors, students' needs, and abilities, thus failing both students and teachers (Kavanaugh & Fisher-Ari, 2017; 2018).

In a study of 164 Australian teachers, the degree to which perceived autonomy support is related to adaptability and, in turn, to which both are related to emotional exhaustion and work disengagement was investigated (Collie et al., 2018). The results demonstrated a significant positive relationship between perceived autonomy support and adaptability, and a negative relationship between perceived autonomy support and both exhaustion and disengagement. Adaptability was negatively related to disengagement. The study found that perceived autonomy support was positively related to organizational commitment. However, exhaustion and disengagement-burnout were negatively related to organizational commitment. The results provided insights into the critical importance of leadership support to teachers and the negative consequences of burnout-disengagement and intention to leave the profession when it is deficient (Collie et al., 2018).

The basic premise of self-determination theory posits that autonomy is one of the fundamental universal psychological needs that is critical for motivation and psychological congruence (Deci et al., 2017; Deci & Ryan, 2000; Gagne & Deci, 2005). Further, self-determination theory postulates that satisfaction of the basic need for autonomy fosters the development of intrinsic motivation (Gagne & Deci, 2005; Slemp et al., 2018). It can thus be expected that the perception of autonomy will positively predict

both teacher engagement and job satisfaction (Greenberg et al., 2016; Price, 2018; Skaalvik & Skaalvik, 2016). Autonomy is primarily involved in activities that require integration and freedom. Teacher autonomy involves the freedom to determine goals, pedagogy, and curricular methodology that are integral to the teacher's personal educational beliefs and values (Greenberg et al., 2016).

Research evidence also showed that perceived autonomy was negatively related to burnout and emotional exhaustion. Skaalvik and Skaalvik (2009) found that perceived teacher autonomy was negatively correlated with all three dimensions of burnout: emotional exhaustion ($r = -.27$), depersonalization ($r = -.26$), and personal accomplishment ($r = -.31$). Also, in a SEM analysis controlling for work overload, discipline problems, and relations with both colleagues and the school principal, Skaalvik and Skaalvik, (2010) found that teacher autonomy was negatively, but weakly related to emotional exhaustion (the standardized regression coefficient was $-.12$).

Teaching is a values-based profession and teachers set goals and design curriculum based on their values, beliefs, and assessment of their students (Ford, 2016). Therefore, lack of autonomy, or the freedom to teach accordingly to one's own values and beliefs, resulting from interference by school administration, parents, or scripted curriculum and testing mandates places teachers at high risk for stress and burnout from lack of autonomy resulting from values conflicts (Yin & Chen, 2019).

Despite indicators that teacher autonomy is an important predictor of job satisfaction, which buffers burnout, there are indications of an international tendency towards the diminishment of teacher autonomy that began in the early 2000's and has

gained momentum over the last decade (Bakker & Demerouti, 2017; Ballet et al., 2006;).

There is a need for clarification of teacher autonomy and the collective culture within

schools that is specific for individual schools as there is a delicate balance between the

need for both (Skaalvik & Skaalvik, 2009). There is a need for both theoretical analysis

and practical clarifications within schools that can be most adequately explored by

implementing the job demands-control-support model proposed by Karasek and Theorell

(1990). According to the job demands-control-support model, job demands, job

control/autonomy, and social support are critical job characteristics and should be

considered when assessing employee stress and burnout. Any combination of high job

demands, low job control, and a lack of social support results in undesirable outcomes in

terms of employee well-being and is often the state within many public schools (Bakker

& Demerouti, 2017).

The relationship between workload and the exhaustion dimension of burnout is a

positive one mediated by job control/autonomy. That is, the capacity to act

autonomously allows one to control workload, thus preventing overload and ensuing

burnout (Portoghese et al., 2014). This relationship is most obvious with decreased levels

of job control. Thus, both workload and job control are factors with the potential to

improve working conditions. Improved working conditions are demonstrated by a low

workload and exhaustion level, which are often attributed to an increase in job control.

Increased job control seems to be a resiliency factor with the potential to protect workers

from exhaustion when workload increases. Findings from a study by Van Yperen et al.,

(2016) indicated that a high workload did not pose major problems in terms of exhaustion when the necessary levels of worker autonomy exist.

Research clearly indicates that transformational leadership training of school leaders is an effective method for mitigating many of the leadership centered problems that result in teacher stress, burnout, and attrition, but concerted, widespread training efforts have not yet been implemented in US public schools (AFT, 2017; Allen et al., 2015). With more rigorous standards in curriculum to ensure student achievement on standardized assessments many school districts have elected to forego teacher autonomy in favor of dictated curriculum (Allen et al., 2015). This has resulted in diminished teacher autonomy in the classroom and in the school community in general. Transforming the schools must begin with a solid foundational base of effective leadership that respects the professionalism of the teacher and the basic human need for autonomy (Allen et al., 2015). The movement away from autonomy, which like supportive leadership is a basic need of teachers that must be met if stress and burnout are to be mitigated and engagement ensured, appears to have gained in momentum (Allen et al., 2015). This effort is being made without proper consideration of the research into teacher psychological needs, or their effects on student outcomes. Greater consideration needs to be given to the complex nature of human psychological needs, teacher, and student burnout in relation to these complexities and the need to devise a more balanced approach to achieve positive teacher and student outcomes (Allen et al., 2015).

Summary and Conclusions

This literature review was focused on the problems that teacher stress and burnout create in school environments, specifically in relation to the generative impact of autonomy and supportive leadership. The integrated application of self-determination theory, Maslach's multi-dimensional burnout theory, the Leiter model and transformational leadership theory were discussed in relation to the variables of this study. The theoretical and methodological differences between Montessori and traditional education were also detailed in view of autonomy and supportive leadership and the possible mitigation of burnout through the implementation of a high-fidelity Montessori model. Finally, the inadequacy and irrelevancy of the methods of assessing the state of the public education system were discussed with the suggestion that the focus of such assessments requires a change in values, a change in indicators. Numerous studies have been performed demonstrating the importance of autonomy and supportive leadership as factors contributing to teacher stress and burnout-engagement, none have been done to measure and compare the dimensions of these variables in traditional and Montessori teachers. Determining the relationships among these variables: autonomy and supportive leadership and burnout within these two teacher orientations has the potential to provide insights into burnout prevention and mitigation methods that will be effective when applied in public elementary programs. Chapter 3 includes a discussion of the research design and rationale, the population and sampling approach, the procedures for recruitment and data collection, the instrumentation and materials, the data analysis plan, the research questions and hypotheses, the threats to validity, and the ethical

considerations pertinent to the study. In the studies that have been performed comparing academic and social outcomes between Montessori and traditional elementary students, Montessori students overall demonstrated advantages in multiple areas.

Chapter 3: Research Method

Introduction

This study was undertaken for the purpose of assessing the relationships between autonomy and supportive school leadership and burnout among Montessori and traditional elementary teachers. Findings from the comparison of teachers from these two philosophically diverse traditions have the potential to provide insights that can inform the development of school leadership and culture in a manner that will perpetuate engagement by mitigating key antecedents of burnout. The study focused on teacher perceptions about autonomy and supportive leadership, which are considered major factors associated with burnout in public elementary school teachers (Greenberg et al., 2016; Skaalvik & Skaalvik, 2014). An increased understanding of the burnout-engagement phenomenon will be reached by developing multidimensional/patterns of burnout and engagement and comparing traditional and Montessori elementary teachers. This chapter will include a description of the research design and methodology, the population, sampling and sampling procedures, procedures for recruitment and participation, data analysis plan, validity and reliability of the instruments used for this study, threats to validity, and ethical considerations.

Research Design and Rationale

The nature of this study was quantitative and used a nonexperimental correlational design using survey methodology. Montessori and traditional elementary school teachers completed surveys to assess perceived autonomy, perceived supportive leadership, and levels of burnout. The independent variables included teachers'

perceptions of teaching autonomy and supportive leadership style. The dependent variables included the three components of burnout: emotional exhaustion, depersonalization, and personal accomplishment. Teacher orientation (Montessori or traditional) was the moderating variable. A cross-sectional study was ideally matched for the intent of this study, as it took place at a single point in time, the variables were not manipulated, it allowed the simultaneous consideration of multiple variables, it allowed observation of prevailing characteristics within the target population, and it provided insights into what was occurring in the population at the time of the study (Rovai et al., 2014). A multiple regression analysis was used to determine the relative strength of perceived teaching autonomy and perceived supervisor leadership style in predicting burnout (emotional exhaustion, depersonalization, and personal accomplishment). Moderating multiple regression analyses were performed to determine the moderating influence of teacher orientation on the relationships determined to be significant.

Methodology

Population

The target population for this study was public school elementary teachers in the United States. Of approximately 3.2 million teachers in the United States, 52.8% (1.69 million) are elementary and 47.2% (1.51 million) are secondary (NCES, 2018). Of the 130,930 public schools in the United States, 87,498 are elementary schools, and only 507 are Montessori (Education Data. Org, 2018; Montessori in the Public Sector, 2020). The participants (sites) for the study came from multiple public Montessori and traditional

elementary schools located throughout the United States recruited through multiple social media sites and professional educational associations.

Sampling and Sampling Procedures

The strategy used in this study was non-probability, convenience sampling. The traditional teacher participants were fourth through sixth grade teachers and approximately grade level matched to the Montessori teacher participants by number of students at each grade level. Montessori classes usually include three grade levels with roughly one third of the students at each level. The sample consisted of traditionally certified elementary teachers and Montessori AMI or AMS credentialed elementary classroom teachers with 1 or more years of classroom teaching experience. The sample was composed of approximately 50% Montessori teachers and 50% traditional teachers. Prior to participation, Montessori teachers were asked to acknowledge that they implement high fidelity practices in their teaching. All participants acknowledged that they are fully certified teachers with at least 1 year of teaching experience prior to the current school year.

The Montessori participants were required to acknowledge adherence to the following criteria that define high-fidelity Montessori schools and programs: the teachers will be trained and certified to teach at the elementary level by either AMI or AMS; classrooms are multi age level: 6-9 and 9-12; the teachers follow the Montessori pedagogy using classic Montessori materials as a curricular base; the Cosmic Curriculum is the integrated framework around which all lessons are developed in all relevant subject areas; the individual needs of the child are the base of lessons; respect is expected

between teacher and student and student and student; sensitivity to multiple intelligences is implemented into small and large group projects and activities; and freedom of choice regarding work is extended to the child with the required responsibility of the child to meet self-imposed and teacher directed goals (per contract) while following classroom guidelines-rules.

It was difficult to identify and involve participants, as most teachers are not in the classroom because of the pandemic forcing the closure of the schools and with uncertainty surrounding their reopening. Therefore, recruiting was done through teacher social media groups rather than through specific school systems. Convenience sampling was the best approach for successfully identifying participants because it is not costly in terms of time, effort, and money (Marshall, 1996).

Power analyses using the G*Power software to determine the appropriate sample size was performed for multiple regression (Faul et al., 2009). In the multiple regression power analysis, an α (significance level) of .05, a power level of .95, an effect size (f^2) of .20 which represents a medium effect size according to Cohen's effect size chart for a multiple regression and 2 predictor variables were used (Cohen, 1992). The resulting sample size was 98 for the multiple regression. A larger sample size of 100 was the target for this study as recommended by Tabachnick and Fidell (2007) to ensure that the statistical power of the analyses was acceptable, but only 82 teachers participated. Previous studies have reported medium effect sizes for the relationships between teacher autonomy and burnout (Alarcon, 2011), and for teacher social support, including leadership support, and burnout (Charoensukmongkol et al., 2016).

Procedures for Recruitment, Participation, and Data Collection

After obtaining approval from the Walden IRB and obtaining approval from the administrators of Facebook and other social media teacher group sites, I posted a description of the study at the group sites along with the Montessori Participation Requirements (Appendix A) or the Traditional Teacher Participation Requirements (Appendix B). These forms consisted of eligibility requirements to be met by potential participants. Those teachers who met the requirements were directed to click on a link that took them to Survey Monkey and the Walden approved informed consent form, followed by the demographic information page, and then the three surveys used for this study. After participants electronically signed the informed consent document, they went to the demographics page, which collected information on age, gender, years of teaching experience, certification type, educational background, school title classification, class size, and grade level. The informed consent form discussed the rights of the participants and the terms of confidentiality of the study. Participants were provided with information on the purpose of the study, the sponsoring institution, the potential risks and benefits involved in participating, and a guarantee of confidentiality. Participants were provided with my email address should they have had questions about the study or wanted a summary of the study results. This study was a single data collection study with no follow-up procedures. Qualified participants completed the surveys in the following order via Survey Monkey: (a) informed consent form, (b) demographic form, (c) MBI-ES, (d) MLQ, and (e) the TAS.

Instrumentation and Operationalization of Constructs

Maslach Burnout Inventory-Educator Survey

The MBI-ES was used to measure levels of burnout among the elementary school teachers (Maslach, 1996; Maslach et al., 2016). The MBI-ES is a 22-item psychological inventory that measures occupational burnout. It consists of the three subscales: depersonalization, emotional exhaustion, and personal accomplishment. The MBI uses a Likert-type response scale ranging from 0-6: never (0), a few times a year or less (1), once a month (2), a few times a month (3), once a week (4), a few times a week (5), and every day (6). The emotional exhaustion subscale (9 items) involves feeling emotionally drained, used up, frustrated, and overworked. An example item for this subscale is "I feel like I'm at the end of my rope." The depersonalization subscale (5 items) involves feelings of detachment and cynicism. An example item for this subscale is "I don't care what happens to some students." The personal accomplishment subscale (8 items) involves feelings about professional performance. An example item for this subscale is "I deal very effectively with the problems of my students" (Maslach & Jackson, 1986). A score is provided on each of the three subscales.

The original version of the MBI was developed by Maslach and Jackson (1981) for the purpose of assessing individual experiences of burnout. The MBI is considered the most highly valid and reliable measure of burnout across professions (Maslach et al., 2009). Thirty-five years of research has resulted in consistent validation studies in varied professional settings. The three dimensions of exhaustion, depersonalization (cynicism), and personal accomplishment (inefficacy) do not constitute a single, one-dimensional

burnout phenomenon, as they are not highly correlated. Burnout level scores do not need to be present in all three dimensions for burnout to exist. It may only be present in one of the three dimensions or two or any combination up to a full-blown burnout where significantly high scores exist across all dimensions. The dimensions of burnout, though interrelated, are distinct and result in patterns that are emerging from recent research studies and providing clearer definitions of burnout in its multiple forms and providing an opportunity for a deeper understanding of the phenomenon and its possible solution (Maslach & Leiter, 2016).

Maslach et al. (1996) stated that the MBI-ES is essentially the same instrument as the original MBI designed for use by those in the helping professions. The only difference between the two forms is the substitution of the word "recipients" from the MBI with "students" on the MBI-ES (Maslach et al., 1996). The authors further stated that the validity of the MBI-ES is assumed from the validity of the MBI (Maslach et al., 1996).

Maslach and Jackson (1981) conducted a discriminant validity study that included 91 social service and mental health workers who completed both the MBI and the Job Diagnostic Survey (a measure of general job satisfaction) to determine if job dissatisfaction and burnout were the same construct. The results indicated that job satisfaction was moderately negatively correlated to the emotional exhaustion ($r = - 0.23$, $p < 0.01$) and the depersonalization ($r = 0.57$, $p < 0.001$) subscales of the MBI (Maslach & Jackson, 1981). They also conducted personal outcome studies to establish the predictive validity of the MBI (Maslach & Jackson, 1981). The results showed that

burnout (high MBI scores) was a significant predictor of intention to quit one's job, R

(6,135) = 0.68, p < 0.001 (Maslach & Jackson, 1981). Two cross validation studies were

conducted for the MBI-ES with teachers (Iwanicki & Schwab, 1981) and school

psychologists (Huberty & Huebner, 1988). The results of these two studies confirmed

that the MBI-ES measures emotional exhaustion, depersonalization, and personal

accomplishment among educators. Shirom and Melamed (2006) compared the construct

validity of the MBI to the Shirom-Melamed Burnout Measure. The study sample

consisted of 196 human services professionals and 226 non-human service professionals

(Shirom & Melamed, 2006). The results confirmed that both instruments have high

discriminant validity for measuring the three dimensions of burnout (Shirom & Melamed,

2006). They found the factor loadings for all items on the MBI-ES to be above .30

(Barari & Barari, 2015). Two recent European studies verified the construct

validity of the MBI-ES as a bifactor model with one general burnout factor and three

specific orthogonal factors of personal accomplishment, depersonalization, and emotional

exhaustion (Hawrot & Koniewski, 2018; Szigeti et al., 2017).

In a meta-analytic reliability generalization study, the mean reliability of the three

dimensions of the MBI across 45 studies and 51 alpha coefficients was .88 for emotional

exhaustion; .71 for depersonalization; and .78 for personal achievement (Aguayo et al.,

2011). Early reliability studies carried out by Iwanicki, and Schwab (1981) and

Gold (1984) supported the three-factor structure and internal reliability with

Cronbach alpha ratings of .90 for emotional exhaustion, .76 for

depersonalization, and .76 for personal accomplishment, which are similar to

those reported by the test publisher (Maslach et al., 2018). The MBI-ES takes

approximately 10 to 15 minutes to complete, does not require permission to use, is

available for purchase at $50 for a PDF of the test and $2 per each reproduction.

Teaching Autonomy Scale

The degree of perceived teaching autonomy by the teacher participants was

measured by the TAS. The TAS was developed by Pearson and Hall (1993) to measure

perceptions of teacher autonomy. The scale consists of two subscales: general and

curricular autonomy. The version of the scale to be used in this study includes 18 items

that relate to general teaching autonomy and curricular autonomy (Gwaltney, 2012;

Pearson & Hall, 1993).

Participants respond to each TAS item using a 5-point scale that ranges from 4

("Definitely True") to 0 ("Definitely False"; Pearson & Hall, 1993). Items are written in

the form of first-person statements targeting behaviors that range from highly

autonomous to non-autonomous. There are two subscale scores. The general teaching

autonomy subscale (12 items) measures classroom standards of conduct and personal on

the job discretion. An example of an item for this subscale is "I select the teaching

methods and strategies that I use with my students." The curriculum autonomy subscale

(6 items) measures selection of activities, materials and instructional planning and

sequencing (Pearson & Moomaw, 2006). An example of an item for this subscale is "the

materials used in my classroom are selected, for the most part, by myself." The two

subscale scores were totaled to provide a teaching autonomy score, which served as an

independent variable. The TAS takes 7 to 10 minutes to complete, has no fee, and is in

the public domain.

The TAS was initially developed and validated as a 35-item instrument to

measure perceptions of teaching autonomy and to validate the two-factor construct of

teaching autonomy (Pearson & Hall, 1993). From the original 35 items, the 20 items with

the highest item total correlations (>.44) were selected for the TAS (Pearson & Hall,

1993). Later, 18 of the 20 were selected per high reliability, resulting in the current

version of the TAS. It was determined that there were two major factors: curricular and

general autonomy that were internally consistent (.91) and defined the construct (Pearson

& Hall, 1993). The internal consistency reliability of the 18-item instrument was .80. The

two major factors of the scale are internally consistent, accurately defined by the items,

and logically consistent with the literature rendering it both a valid and reliable research

instrument for measuring teachers' perceptions of autonomy (Pearson & Hall, 1993). In a

later study involving 171 teachers, Pearson and Moomaw (2006) confirmed earlier results

finding the internal consistency reliability on the two scales to be .83 for the 18-item

scale. Internal consistency values for the curriculum autonomy and general teaching

autonomy subscales were $\alpha = .81$ and .85, and the correlation between the subscales was r

= .28 (Pearson & Moomaw, 2006). Confirmatory factor analysis confirmed the construct

validity of the two subscales. Using maximum-likelihood estimation with LISREL the

two-factor model was supported: χ^2 (134, N = 171) = 280.88, p = .01, comparative fit

index (CFI) = .82. The root mean square error of approximation (RMSEA) also indicated

a reasonable fit of the data to the model (RMSEA = .08) (Pearson & Moomaw, 2006).

Multifactor Leadership Questionnaire

The degree of perceived supportive leadership will be measured by the

Multifactor Leadership Questionnaire (MLQ) (Bass & Avolio, 2004). The MLQ Rater

Form is a psychological inventory composed of 45 items (36 items related to leadership

styles and 9 items related to leadership outcomes) (Bass & Avolio, 2004). The MLQ

consists of 5 subscales that measure transformational leadership, 2 subscales that measure

transactional leadership, 2 subscales that measure passive/avoidant behavior, and 3

subscales that measure outcomes of leadership (Bass & Avolio, 2004). The five

transformational leadership subscales consisting of 20 items, will be used in this study to

provide the data required to determine the relationship between supportive leadership and

burnout in teachers. The transformational leadership scale allows for an overall average

score of all five subscales: builds trust (4 items), acts with integrity (4 items), encourages

others (4 items), encourages innovative thinking (4 items) and coaches and develops

people (4 items) (Bass and Avolio, 2004). Higher scores in these five subscales

corresponds to a higher frequency of transformational leadership behaviors. An example

of an item from the MLQ transformational leadership rater form (rates leaders) is "is

effective in meeting my job-related needs." The MLQ can be administered to individuals

or to a group in about 15 minutes (Mindgarden, 2020). The 45 items in the questionnaire

are rated on a Likert scale of 1-5: Not at all (1), Once in a while (2), Sometimes (3),

Fairly often (4), and frequently, if not always (5) (Avolio & Bass, 2005).

In evaluating the reliability of the MLQ, Rowold (2005) measured internal

consistency (Cronbach's alpha), the interrater agreement, and the test-retest reliability.

Cronbach's alpha was calculated for each subscale of the MLQ with values ranging from .61 to .88 (Rowold, 2005). The interrater agreement for each of the nine subscales was measured for each of the nine leadership scales and ranged from satisfactory to high (.74 to .97). The test-retest reliabilities of the 9 MLQ leadership scales, which is a measure of the stability of the instrument over time, was measured at two points over a three-month interval. The test-retest reliabilities were high and significant ranging from .78 to .92 (Avolio et al., 1999). Avolio and Bass (2005) found test-retest reliabilities for each of the six leadership factor scales that ranged from .63 to .92 in the initial sample set, and .64 to .92 in the replication set. The test-retest reliabilities were consistent with earlier results reported for the MLQ (Bass & Avolio, 1990). Estimates of internal consistency were above .70 for all scales except for active management-by-exception (Avolio & Bass, 2005).

In numerous studies, the external validity of the MLQ transformational leadership scale measured across diverse cultural, professional, ethnic, age groups and genders, in numerous language versions was found to be high (Avolio & Bass, 2005). Transformational leaders were found to generate higher commitment in their followers (Avolio, 1999; Avolio & Yammarino, 2002; Bass, 1998a), greater organizational commitment of teachers and students, and greater follower compliance (Koh, Terborg & Steers, 1991). Fuller, Patterson, Hester, & Stringer (1996) confirmed these results in a meta-analytic review.

The MLQ has been validated in an ongoing process that has spanned the last two decades. This ongoing process has involved revisions and refinements that have increased

both the validity and the reliability of the instrument (Northouse, 2007). The construct

validity of the instrument has been confirmed by over 57 factor analysis studies (Yuki,

2006). A meta-analysis of 87 validity studies resulted in a validity coefficient of 0.44,

which confirmed the predictive validity of the transformational leadership scale for

performance, motivation and follower satisfaction (Judge & Piccolo, 2004). Antonakis

(2001) confirmed the construct validity of the MLQ in a review of 6,525 diverse samples

from 18 studies. The results of the confirmatory structural equation modeling technique

applied indicated that the factor structure was best represented by the Bass and Avolio's

original assertion of nine single-order factors (Antonakis, 2001). According to Antonakis

(2001), confirmation of the validity of the nine-factor model is conditional upon the use

of homogeneous or integrated samples.   A study supporting the structural validity of the

MLQ was conducted by Armstrong and Muenjohn (2008). They concluded after an

analysis 74 organizations, located in England and Thailand, that the MLQ was valid in

adequately measuring the full leadership factor constructs of transformational leadership.

Eshbach and Henderson (2010) found in a study of 58 elementary schools, that the MLQ

was valid in determining the relationship between the leadership style of first year

elementary principals and the organizational climate of the school. Barnett and

McCormick (2004) conducted a study with 373 teachers in elementary, middle and high

schools in Australia. They found a significant positive relationship between

transformational leadership style, as defined by the MLQ, and higher student

achievement (Hardman, 2011). The initial MLQ validation process consisted of 14

samples for a total of 3,786 respondents to validate and cross-validate the instrument

(Avolio & Bass, 2000). The MLQ takes 10-15 minutes to complete, does not require permission to use, and is available for purchase as a remote online survey license for $125 for quantities of 50.

Demographic Characteristics

After participants electronically signed the informed consent document, they completed the Demographic Information Form (Appendix C) which collected information on age, gender, years of teaching experience, certification type, educational background, school title classification, class size and grade level. Age, grade level, class size and years of teaching experience were measured on a continuous scale. Level of education was selected from the following: Bachelor's degree, Master's degree, Doctoral degree, other. Gender was selected from: Male, Female, or other. Certification type was selected from the following: Montessori, AMI or AMS, and traditional state teacher certification. School title classification was selected from the following: Title I, Title II, Title III, or none of the three.

<div align="center">

Data Analysis Plan

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The Statistical Package for Social Sciences (SPSS) version 27.0 software was used to analyze the data. The data was screened and cleaned for outliers, missing data, and assumption violations (Rovai, Baker & Ponton, 2014). Research questions 1, and 3, were evaluated by conducting multiple regression analyses to measure the strength of the relationships among teaching autonomy, transformational leadership style and the three dimensions of burnout (emotional exhaustion, depersonalization, and personal accomplishment in elementary teachers. Research questions 2, and 4, were evaluated by

conducting moderating multiple regression analyses to measure the moderating influence of teacher orientation (Montessori or traditional) on the relationships measured in research questions 1 and 3 that were significant.

Screening of the data was done prior to the analysis to determine if the data met the assumptions for the multiple regression analysis. The multiple regression assumptions tested were: (a) there must be normally distributed scores, (b) there must be no or little multicollinearity, (c) there must be a linear relationship between the independent and dependent variables and (d) there must be homoscedasticity (Green & Salkind,2014). To test the assumptions of the multiple regression analysis multiple methods can be used. To test for normality, skewness, and kurtosis, as well as the normal probability plot or the Q-Q plot will be used. Linearity was tested using a scatterplot or a histogram. Multicollinearity was determined using the bivariate correlation matrix (values < .80 will be acceptable), or the variance inflation factor (VIF; values <10 will be acceptable). The absence of autocorrelation was determined with a Durbin-Watson's d test. Finally, a scatterplot of residuals versus predicted values was used to determine homoscedasticity.

Research Questions and Hypotheses

RQ1: To what extent does perceived autonomy, as measured by the Teaching Autonomy scale, relate to the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment), as measured by MBI-ES subscales among elementary teachers?

$H_{\emptyset 1}$: Perceived autonomy is not a significant predictor of burnout.

H_1: Perceived autonomy is a significant predictor of burnout.

RQ2: To what extent does teacher orientation moderate the relationship between perceived autonomy and the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment) in elementary teachers?

$H_{\emptyset 2}$: Teacher orientation does not significantly moderate the relationship between perceived autonomy and burnout.

H_2: Teacher orientation does significantly moderate the relationship between perceived autonomy and burnout.

RQ3: To what extent does perceived supervisor leadership style, as measured by the transformational leadership scale of the MLQ, relate to the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment), as measured by MBI-ES subscales, among elementary teachers?

$H_{\emptyset 3}$: Level of perceived supervisor leadership style is not a significant predictor of burnout.

H_3: Level of perceived supervisor leadership style is a significant predictor of burnout.

RQ4: To what extent does teacher orientation moderate the relationship between perceived supervisor leadership style and the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment) among elementary teachers?

$H_{\emptyset 4}$: Teacher orientation does not significantly moderate the relationship between perceived supervisor leadership style and burnout.

*H*₄: Teacher orientation does significantly moderate the relationship between perceived supervisor leadership style and burnout.

To test the hypotheses associated with RQ's 1, and 3, three standard (entry method) multiple regression analyses were performed. The model included the predictor variables of teaching autonomy, and perceived leadership style. The outcome variables included emotional exhaustion, depersonalization, and personal accomplishment burnout. To test for the significance of the relationships associated with RQ's 1, and 3, multiple regression analyses were performed. Because the null hypothesis associated with RQ's 1, and 3 were rejected and the alternative hypotheses supported, RQ's 2, and 4, were evaluated with moderating multiple regression analyses with teacher orientation as the moderating variable. It was determined that Montessori teacher orientation significantly moderated the relationships between the predictor variables and the three outcome variables, thus consideration of Montessori as a possible model for burnout mitigation was indicated.

<div align="center">**Threats to Validity**</div>

Correlational research is typically characterized as having low internal validity because the variables are not manipulated or controlled, and no causal relationship exists (Frankfort-Nachmias, 2014). Internal validity is finding that the outcome was caused by the independent variable(s). As this does not happen with correlational research it is not the focus, internal validity is essentially irrelevant in correlational studies. They do characteristically have high external validity as they more accurately reflect real world relationships (Frankfort-Nachmias et al., 2014)).

Among the major threats to validity that could influence the outcome of a correlational study, historical/temporal threats and instrumentation threats are most applicable to this study. Historical/temporal validity threats may influence the results of this study due to the time of year that the data is collected as could major societal events occurring before and during the data collection period (Cooper, 2020). Teachers may also be subject to varying levels of stress and burnout across the 10-month span of a school year that could influence perceptions being assessed. Studies have indicated that stress resulting from the fluctuating resource-demand ratios in schools vary over the school year often increase in the spring because of standardized testing and also in the fall due to expectations and goal setting for the school year (Kenyeri, 2002; O'Donnell, Lambert, & McCarthy, 2008). The time of year that data is collected could influence the results. Thus, collecting data in the late fall (late October through mid-November) or early in the spring semester (January-February) could minimize this influence.

Another historical threat involves the extraneous events occurring during the study and during the months preceding it that may affect the participants' responses on the dependent measure (Cooper, 2020). The Covid-19 pandemic that has shut down most public and private schools in the US during the latter part of the 2019-2020 academic year may result in continuing closures in the upcoming school year. This qualifies as a major societal event that may influence teachers and their responses to the study instruments as well as the screening instruments. Being separated from the usual dynamics of the school environment may influence their perceptions and responses in a way that does not reflect their perceptions of experiences under usual conditions. Asking

the participants to reflect on their most recent in-school experiences may have some impact on the quality and relevance of their responses. The high validity and reliability of the three instruments selected to measure the dependent and independent variables may also help to minimize this threat.

Another threat to internal validity could be experienced in the approach to sample selection. Those Montessori teachers participating will review the Montessori Participation Requirements (Appendix A). The requirements screen for high-fidelity Montessori teachers but could be subject to social desirability bias. The tendency of survey respondents to answer questions in a manner that will be viewed favorably by others could be a concern in Montessori public school teachers because of the temptation to follow the traditional curriculum or the status quo. It could take the form of over-reporting high fidelity Montessori behaviors when they are lower fidelity when high fidelity is the requirement for participants. Communicating the anonymous and confidential way the data will be handled may result in the participants responding more truthfully to the participation requirements. Social desirability bias is not as much of a risk in the selection of traditional teachers as the Traditional Teacher Participation Requirements (Appendix B) are objective and do not include specific questions on pedagogy as with the Montessori teachers. One purpose of the study is to compare high-fidelity Montessori teachers with traditional teachers. The goal of Montessori teacher selection is that only those teachers possessing fidelity to the Montessori pedagogy will be included. The traditional teachers will be certified as qualified teachers matched to the Montessori teachers by grade level and schools title as accurately as possible.

Statistical conclusion validity is another possible threat to the internal validity of this study. This involves making faulty conclusions about the relationship among independent and dependent variables based on the data collected (Cozby, 2009). Since the purpose is to determine the extent to which independent variables in the regression analysis predict burnout, it is important to remember that I cannot assume causal relationships between the variables (Frankfort-Nachmias, Nachmias & DeWaard, 2014).

Ethical Procedures

Following approval from the Walden University Institutional Review Board (IRB), the data collection for this study began. As study participants rated their schools, principals, communities, and social/psychological climates of their schools, it was critical that they were made aware of the efforts to minimize their risks through anonymity and confidentiality. Survey Monkey was used for data collection. No personally identifying information was collected from participants. Participants received the right to privacy and confidentiality disclosures prior to data collection via informed consent. In the event that any of the participants may have had questions regarding the test items, or concerns about confidentiality and/or anonymity, my contact information and contact information for the Walden Institutional Review Board was provided. If participants experienced any negative consequences from involvement in the study, they were advised to contact their Employee Assistance Program that is provided by the school district. They had the option to speak to a licensed mental health professional at no cost through their Employee Assistance Program.

Summary

This chapter contained a description of the methodology to be used for collecting and analyzing data to examine potential relationships among autonomy, supportive leadership, and burnout in Montessori and traditional public-school elementary teachers. This chapter included a description of the measurement instruments (the Maslach Burnout Inventory-Educator Survey, the Multifactor Leadership Questionnaire, and the Teaching Autonomy Scale) and a description of the procedures that will be used to analyze the data. Potential threats to validity were discussed as well as potential ethical considerations.

Chapter 4: Results

Introduction

The purpose of this quantitative survey study was twofold: 1) to assess the

relationships among autonomy and supportive leadership and burnout in public

elementary teachers; and 2) to assess possible differences in burnout patterns between

Montessori and traditional elementary teachers. Comparing teachers from these two

pedagogically diverse educational methods has the potential to provide insights that can

inform the development of school leadership and culture in a manner that will perpetuate

engagement by mitigating key antecedents of burnout. Four research questions were

tested in this study. Two were tested with linear multiple regressions and two with

moderation multiple regressions. In this chapter, the research questions and hypotheses

are restated, followed by a description of the data collection and screening procedures.

Descriptive statistics and evaluation of statistical assumptions are also provided. The

chapter concludes with a summary of results of the moderation multiple regression

analysis.

Research Questions

RQ1: To what extent does perceived autonomy, as measured by the Teaching

Autonomy scale, relate to the components of burnout (emotional exhaustion,

depersonalization, and personal accomplishment), as measured by MBI-ES subscales

among elementary teachers?

$H_{\emptyset 1}$: Perceived autonomy is not a significant predictor of burnout.

H_1: Perceived autonomy is a significant predictor of burnout.

RQ2: To what extent does teacher orientation moderate the relationship between perceived autonomy and the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment) in elementary teachers?

$H_{\emptyset 2}$: Teacher orientation does not significantly moderate the relationship between perceived autonomy and burnout.

H_2: Teacher orientation does significantly moderate the relationship between perceived autonomy and burnout.

RQ3: To what extent does perceived supervisor leadership style, as measured by the transformational leadership scale of the MLQ, relate to the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment), as measured by MBI-ES subscales, among elementary teachers?

$H_{\emptyset 3}$: Level of perceived supervisor leadership style is not a significant predictor of burnout.

H_3: Level of perceived supervisor leadership style is a significant predictor of burnout.

RQ4: To what extent does teacher orientation moderate the relationship between perceived supervisor leadership style and the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment) among elementary teachers?

$H_{\emptyset 4}$: Teacher orientation does not significantly moderate the relationship between perceived supervisor leadership style and burnout.

H~4~: Teacher orientation does significantly moderate the relationship between

perceived supervisor leadership style and burnout.

Data Collection

Data collection occurred over a 5-month period from March to August 2021.

Study participants were recruited from Facebook teacher sites, professional teacher

associations including the AMI, the AMS, and affiliates of the National Association of

Teachers. Inclusion criteria for the study were posted on the social media sites or

provided to individual schools by the professional teacher associations. Participants were

required to be U.S. public elementary teachers, to teach either grade 4, 5, or 6, or a

combination of grades 4-6, to be traditional state certified or Montessori and state

certified, and to have at least one year of experience teaching in a public school. The

survey was administered in an online format via Survey Monkey and began with the

informed consent form that explained the purpose of the study 1) to assess the

relationships among autonomy, supportive leadership, and burnout in public elementary

teachers; and 2) to assess possible differences in burnout patterns between Montessori

and traditional elementary teachers.

The consent form also included a description of procedures, the voluntary nature

of the study, risks and benefits, privacy, and contact information. The survey was

anonymous; no identifying information was collected to protect participant privacy.

Respondents who provided consent were directed to nine demographic questions,

followed by the three instruments used in the survey to assess burnout (MBI-ES) teaching

autonomy scale (TAS), and transformational leadership scale of the (MLQ).

Participants were given the option to withdraw from the study at any time. Those respondents who did not respond to all items in the survey were eliminated, resulting in a total sample size of $N = 82$. Two predictor variables (i.e., perceived teaching autonomy, and perceived transformational leadership style) and three outcome variables (i.e., emotional exhaustion, depersonalization, and personal accomplishment burnout) were used to examine the research questions and hypotheses.

The demographics (i.e., age, gender, grade level, class size, years of experience, level of education, certification type, school type, and environment type) are displayed in Table 1. Most participants were in the 36-40 (30.5%) and the 41-50 (31.7%) age groups, and the majority were female ($N = 54$, 65.9%). The majority (52.4%, $N=42$) taught a combination of Grades 4, 5, and 6, and the rest (48.8%, $N=40$) taught either Grade 4 (20.7%) or 5 (26.8%). The majority ($N=53$, 64.6%) reported class sizes of 21-25 students. Most participants (91.5%, $N=75$) reported having a minimum of 2 years teaching experience, with 47.6%, ($N=39$) having over 5 years of teaching experience. Most of the participants had master's level degrees ($N=45$, 54.9%), 29.3% ($N=24$) had post baccalaureate educational training, 11% ($N=9$) held bachelor's degrees, and 4.9% ($N=4$) had PhD's. 51.2% ($N=42$) of the sample was composed of teachers with both Montessori and state elementary certification, and 48.8% ($N=40$) held state elementary teacher certification. Most of the participants, 56.1% ($N=46$), taught in schools with no title classification, 36.6% ($N=30$) taught in Title I schools, and 7.3% ($N=6$) taught in Title III schools. The data were collected when COVID-19 restrictions were in place in public schools, with 63.4% ($N=52$) of the teachers teaching in hybrid school environments,

35.4% (*N*=29) in face-to-face environments, and 1.2% (*N*=1) in distance learning environments.

As a convenience sampling method was used in this study. It is unknown whether the sample characteristics are representative of the U.S. elementary school teacher population. Accordingly, the results of the study cannot be generalized to all U.S. public elementary teachers. Although probability sampling would increase the sample representativeness and generalizability, the constraints specific to conducting research online make random sampling unavailable; external validity is therefore limited.

Table 2

Frequencies: Age, Gender, Grade Level, Class Size, Years of Experience, Education Level, Certification Type, School Type, and Environment Type

Age	20-25	3	3.7%
	26-30	7	8.5%
	31-35	10	12.2%
	36-40	25	30.5%
	41-50	26	31.7%
	50+	11	13.4%
Gender	Female	54	65.9%
	Male	27	32.9%
	Other	1	1.2%
Grade level	Grade 4	17	20.7%
	Grade 5	22	26.8%
	Grades 4,5,6	43	52.4%
Class size	10-20	20	24.4%
	21-25	53	64.6%
	26-30	9	11%
Experience level	1 Year	7	8.5%
	2-5 Years	36	43.9%
	5+ Years	39	47.6%
Education level	Bachelor's degree	9	11%
	Post Baccalaureate	24	29.3%
	Master's degree	45	54.9%
	PHD	4	4.9%
Certification type	State	40	48.8%
	Montessori/State	42	51.2%
School type	Title I	30	36.6%
	Title III	6	7.3%
	None	46	56.1%
Environment type	Face-to-face	29	35.4%
	Distance learning	1	1.2%
	Hybrid	52	63.4%

Results

Descriptive Statistics

The total sample included 82 public elementary teachers who completed the

study. The following means and standard deviations were calculated for the two predictor

variables: perceived teaching autonomy (*M* = 2.17, *SD* = .894) and perceived

transformational leadership style of school principals (*M* = 42.65, *SD* = 12.06). Means

and standard deviations were also calculated for the following outcome variables:

emotional exhaustion-burnout, (*M* = 2.10, *SD*=1.45), depersonalization-burnout (*M* =

1.56, *SD* = 1.47), and personal accomplishment-burnout (*M* = 3.61, *SD* = 1.27). Table 2

displays the means and standard deviations for the predictor and outcome variables.

Table 3

Descriptive Statistics for Predictor and Outcome Variables

Variable	*M*	*SD*	*Min*	*Max*
Teaching autonomy*	42.65	12.06	21	60.00
TF leadership style*	2.17	.894	.05	3.80
MBI emotional exhaustion*	2.10	1.45	.11	5.00
MBI depersonalization*	1.56	1.47	.00	5.20
MBI personal accomplishment*	3.61	1.27	.80	4.80

 *N=82

In addition to deriving a total teaching autonomy score comprised of curricular

and general autonomy sub scores, the TAS also provides classifications that define low,

moderate, and high teaching autonomy. Specifically, a total teaching autonomy score of

0-39 is considered low autonomy, 40-55 is considered moderate autonomy, and 56-72 is

considered high autonomy (Cameron, 2008). More than half of the sample (*N*=50) are in the moderate to high teaching autonomy groups, with *N*=41 in the moderate autonomy group, mean score of 50.25, and 9 in the high autonomy group with a mean score of 57.22. The low autonomy group (*N*=32) had a mean score of 28.81. The autonomy scores for state certified elementary teachers (*N*=40) were *M*=31.9 and Montessori-state certified elementary teachers (*N*=42) were 52.90. The classifications of participants teaching autonomy scores are displayed in Table 3.

The total teaching autonomy score was derived from participants rating their perceived autonomy to 18 items portraying their experiences in the classroom and the school environment on a scale from 0 (definitely false) to 4 (definitely true). The 18 items included six items pertaining to their perceptions of curricular autonomy, and the other twelve pertained to perceived general autonomy.

Table 4

Descriptive Statistics for Teaching Autonomy Scale Classifications

Categories	*N*	*M*
Low teaching autonomy	32	28.81
Moderate teaching autonomy	41	50.26
High teaching autonomy	9	57.22
State certified teaching autonomy	40	31.90
Montessori-state certified autonomy	42	52.90

The transformational leadership style score was derived from the transformational leadership scale of the Multifactor Leadership Questionnaire. The scale is composed of 20 items pertaining to transformational leadership behaviors of school leaders. Participants rated their school leader according to each of these items on a scale from 0

(not at all) to 4 (frequently if not always). In addition to deriving a total transformational

leadership style score comprised of the sub scales of idealized influence (attributed),

idealized influence (behavior), inspirational motivation, intellectual stimulation, and

individualized consideration, the TFL scale also provides classifications that define low,

moderate, and high levels of transformational leadership in school leaders. Specifically, a

total TFL score of 0-2.5 is considered a low level of TFL style, 2.51-3.2 is considered a

moderate level of TFL style, and 3.21-4.00 is considered a high level of TFL style (Bass

and Avolio, 2004).

More than half of the sample (N=44) are in the low TFL style group, with a mean

of 1.43, the moderate TFL style group (N=33) had a mean score of 2.92, and the high

TFL style group (N=5) had a mean score of 3.48. The TFL style scores for state certified

elementary teachers (N=40) were M=1.437 and Montessori-state certified elementary

teachers (N=42) were 2.85. The classifications of participants TFL style scores are

displayed in Table 5.

Table 5

Descriptive Statistics for Transformational Leadership Style Scale Classifications

Categories	N	M
Low transformational leadership style	44	1.43
Moderate transformational leadership style	33	2.92
High transformational leadership style	5	3.48
State certified transformational leadership style	40	1.43
Montessori-state certified transformational leadership style	42	2.85

Evaluations of Statistical Assumptions

Assumptions for multiple regression were tested prior to (linearity) and during the regression analyses (i.e., multicollinearity, normality, homoscedasticity, and independence of residuals). Linearity between independent and dependent variables was examined using scatterplots. Scatterplots demonstrating linear relationships between each independent and dependent variable are provided in Appendix G. The linearity assumption was met for the data. Multicollinearity was assessed by examining the VIF. Table 5 displays the VIF for the predictor variables. The multicollinearity assumption has been met, as VIF values are below 10 and tolerance scores are close to 0.2. Normality was tested using the Shapiro-Wilk test and Q-Q plots. Table 6 provides the results of the Shapiro-Wilk test and indicates that the variables are not normally distributed. Q-Q plots for all variables are also provided in Appendix G and demonstrate that all data points are close to or on the line for each variable. Therefore, the assumption of normality of residuals was met. Homoscedasticity was examined using scatterplots of the standardized residual and standardized predicted values for the three regressions (Appendix G). Examination of the scatterplots indicates the variance of residuals is not constant for all regressions. The assumption of homoscedasticity was not met.

Table 6

Collinearity Diagnostics for Predictor Variables

Variable	Tolerance	*VIF*
(Constant)		
Perceived Autonomy	.194	5.164
Perceived TFL	.194	5.164

The Durbin-Watson *d* test was conducted to examine independence of residuals.

Table 7 provides the Durban-Watson test results for each of the three regressions, using

the two predictor variables (i.e., teaching autonomy and TFL style) in each regression.

The Durbin-Watson scores are close to 2.0, indicating the assumption of independence of

residuals was met.

Table 7

Shapiro-Wilk Normality Testing for Study Variables

Variable	Statistic	Df	P	Skewness	Kurtosis
MBI-Emotional Exhaustion	.820	82	<.001	.788	-.922
MBI-depersonalization	.811	82	<.001	1.044	-.149
MBI-Personal Accomplishment	.803	82	<.001	-.576	-1.363
TFL Style	.928	82	<.001	-.366	-.999
Teaching Autonomy	.880	82<	<.001	-.334	-1.488

Table 8

Model Summary: Durbin-Watson d Test

Outcome Variable	Durbin-Watson
MBI-Emotional Exhaustion	2.038
MBI-Depersonalization	1.460
MBI-Personal Accomplishment	1.999

In addition to testing the assumptions for multiple regression, Cronbach's alpha

was computed to test the reliability of the instruments used for the current sample. Table

9 provides the Cronbach's alpha coefficients (*a*) for each instrument, and each had

acceptable internal consistency, ranging from .88 to .99.

Table 9

Cronbach's Alpha Coefficients for Study Instruments

Instrument	*Alpha*
MBI-Emotional Exhaustion (subscale)	.986
MBI-Depersonalization (subscale)	.970
MBI-Personal Accomplishment (subscale)	.987
Teaching Autonomy Scale	.889
Multifactor Leadership Questionnaire- Transformational Leadership Scale	.990

Multiple Regression Analyses

To answer research questions 1: To what extent does perceived autonomy, as measured by the Teaching Autonomy Scale, relate to the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment), as measured by MBI-ES subscales among elementary teachers? and research question 3: To what extent does perceived supervisor leadership style, as measured by the transformational leadership scale of the MLQ, relate to the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment), as measured by MBI-ES subscales, among elementary teachers? three separate multiple regressions were conducted. A multiple regression equation was devised for each of the subscales: emotional exhaustion, depersonalization, and personal accomplishment of the MBI-ES to determine the strength of the influence of the two predictor variables on the outcome variables.

Emotional Exhaustion

The first multiple regression model included the two predictor variables, perceived teaching autonomy and transformational leadership style, and the outcome variable emotional exhaustion burnout. Based on the correlations appearing in Tables 10-

11, emotional exhaustion was significantly, negatively, and strongly related to both

teaching autonomy ($r = .867$, $p = .002$, $r^2 = .752$), and transformational leadership style

($r = .889$, $p < .001$, $r^2 = .790$). The multiple correlation ($R = .902$) was large and differed

significantly from zero ($F(2,79) = 173.114$, $p < .001$). The $R^2 = .814$ and had a large

effect size which indicated that teaching autonomy and transformational leadership style

are strong predictors of emotional exhaustion burnout. A total of 81.4% of the variability

of emotional exhaustion in the model can be explained by teaching autonomy and

transformational leadership style.

Table 10

ANOVA Results for Model 1: Emotional Exhaustion

Model		SS	df	MS	F	R	R^2	P
1	Regression	139.900	2	69.950	173.114	.902	.814	<.001
	Residual	31.021	79	.404				
	Total	171.822	81					

Table 11 indicates that both teaching autonomy and transformational leadership

style had a negative and significant impact on emotional exhaustion burnout. The

standardized and unstandardized regression coefficients for teaching autonomy were

statistically significant, negative, and represented a small effect size accounting for 2.5%

of the variability in emotional exhaustion ($b = -.043$, $p = .002$, $\beta = -.357$, $sr^2 = .025$).

Transformational leadership style had a negative, significant, and moderately small effect

on emotional exhaustion ($b = -.922$, $\beta = -.568$, $p < .001$, $sr^2 = .062$) and accounted for

6.2% of the variability in emotional exhaustion. Therefore, the null hypothesis for

research question 1: $H_{\emptyset 1}$: Perceived teaching autonomy is not a significant predictor of

emotional exhaustion burnout, and for research question 3: $H_{Ø3}$: Level of perceived

supervisor leadership style is not a significant predictor of emotional exhaustion burnout,

were rejected. These findings demonstrate that higher levels of both perceived teaching

autonomy and transformational leadership style were associated with lower levels of

emotional exhaustion burnout.

Table 11

Coefficients: Prediction of Emotional Exhaustion Burnout

Model		B	SE	β	R	r^2	sr^2	T	P
1	(Constant)	5.931	.287					20.63	<.001
	Teaching Autonomy	-.043	.013	-.357	.867	.752	.025	-3.236	.002
	TFL Style	-.922	.179	-.568	.889	.790	.062	-5.158	<.001

N = 82

Depersonalization

The second multiple regression model included the two predictor variables,

perceived teaching autonomy and transformational leadership style, and the outcome

variable depersonalization burnout. Based on the correlations appearing in Table 12-13

depersonalization was significantly, negatively, and strongly related to both teaching

autonomy ($r = .862, p = .002, r^2 = .743$), and transformational leadership style ($r = .873$,

$p < .001, r^2 = .762$). The multiple correlation ($R = .888$) was large and differed

significantly from zero (F (2,79) = 151.776, $p < .001$). The $R^2 = .788$ and had a large

effect size which indicated that teaching autonomy and transformational leadership style

are strong predictors of depersonalization burnout. A total of 78.8% of the variability of

depersonalization in the model can be explained by teaching autonomy and

transformational leadership style.

Table 12

ANOVA Results for Model 2: Depersonalization

Model		SS	df	MS	F	R	R^2	P
2	Regression	139.050	2	69.525	151.776	.888	.788	<.001
	Residual	36.188	79	.458				
	Total	175.238	81					

Table 13 indicates that both teaching autonomy and transformational leadership

style had a negative and significant impact on depersonalization burnout. The

standardized and unstandardized regression coefficients for teaching autonomy were

statistically significant, negative, and represent a small effect size accounting for 3.1% of

the variability in depersonalization ($b = -.049$, $p < .001$, $\beta = -.405$, $sr^2 = .031$).

Transformational leadership style had a negative, significant, and moderately small effect

on emotional exhaustion ($b = -.834$, $\beta = -.509$, $p < .001$, $sr^2 = .050$) and accounted for 5%

of the variability in depersonalization. Therefore, the null hypothesis for research

question 1: $H_{\emptyset 1}$: Perceived teaching autonomy is not a significant predictor of

depersonalization burnout, and for research question 3: $H_{\emptyset 3}$: Level of perceived

supervisor leadership style is not a significant predictor of depersonalization burnout,

were rejected. These findings demonstrate that higher levels of both perceived teaching

autonomy and transformational leadership style were associated with lower levels of

depersonalization burnout.

Table 13

Coefficients: Prediction of Depersonalization Burnout

Model		B	SE	β	R	r²	sr²	T	P
2	(Constant)	5.476	.306					17.894	<.001
	Teaching Autonomy	-.049	.014	-.405	-.862	.743	.031	-3.483	<.001
	TFL Style	-.834	.190	-.509	-.873	.762	.050	-4.385	<.001

Personal Accomplishment

The third multiple regression model included the two predictor variables, perceived teaching autonomy and transformational leadership style, and the outcome variable personal accomplishment burnout. Based on the correlations appearing in Table 14-15 personal accomplishment was significantly, positively, and strongly related to both teaching autonomy ($r = .916$, $p < .001$, $r^2 = .839$), and transformational leadership style ($r = .918$, $p < .001$, $r^2 = .843$). The multiple correlation ($R = .940$) was large and differed significantly from zero (F (2,79) = 306.974, $p < .001$). The $R^2 = .883$ had a large effect size which indicated that teaching autonomy and transformational leadership style are strong predictors of personal accomplishment burnout. A total of 88.3% of the variability of personal accomplishment in the model can be explained by teaching autonomy and transformational leadership style.

Table 14

ANOVA Results for Model 3: Personal Accomplishment

Model		SS	df	MS	F	R	R²	P
3	Regression	116.062	2	58.031	306.974	.940	.883	<.001

Residual	14.934	79	.189	
Total	130.996	81		

Table 15 indicates that both teaching autonomy and transformational leadership style had a positive and significant impact on personal accomplishment. The standardized and unstandardized regression coefficients for teaching autonomy were statistically significant, positive, and represent a small effect size accounting for 4.4% of the variability in personal accomplishment ($b = .050$, $p < .001$, $\beta = -.476$, $sr^2 = .044$). Transformational leadership style had a positive, significant, and moderately small effect on emotional exhaustion ($b = .694$, $\beta = .490$, $p < .001$, $sr^2 = .046$) and accounted for 4.6% of the variability in personal accomplishment burnout. Therefore, the null hypothesis for research question 1: $H_{\emptyset 1}$: Perceived teaching autonomy is not a significant predictor of personal accomplishment burnout, and for research question 3: $H_{\emptyset 3}$: Level of perceived supervisor leadership style is not a significant predictor of personal accomplishment burnout, were rejected. These findings demonstrate that higher levels of both perceived teaching autonomy and transformational leadership style were associated with higher levels of personal accomplishment which resulted in lower levels of personal accomplishment burnout.

Table 15

Coefficients: Prediction of Personal Accomplishment Burnout

Model		B	SE	β	R	r^2	sr^2	T	P
3	(Constant)	-.024	.197					-.120	.904
	Teaching Autonomy	.050	.009	.476	.916	.839	.044	5.515	<.001
	TFL Style	.694	.122	.490	.918	.843	.046	5.678	<.001

Moderation Analyses

To answer research question 2: To what extent does teacher orientation moderate the relationship between perceived autonomy and the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment) in elementary teachers? and research question 4: To what extent does teacher orientation moderate the relationship between perceived supervisor leadership style and the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment) among elementary teachers? moderation analyses were conducted. To determine if the moderator variable, teacher orientation, affects the relationship between the predictors and the outcome variables, six moderation analyses were conducted.

Moderation Models

The first moderation model included teaching autonomy, the interaction variable between teaching autonomy and teacher orientation, and the outcome variable emotional exhaustion burnout. The second moderation model included teaching autonomy, the interaction variable between teaching autonomy and teacher orientation, and the outcome variable depersonalization burnout. The third moderation model included teaching autonomy, the interaction variable between teaching autonomy and teacher orientation, and the outcome variable personal accomplishment burnout. The fourth moderation model included transformational leadership style, the interaction variable between transformational leadership style and teacher orientation, and the outcome variable emotional exhaustion burnout. The fifth moderation model included transformational

leadership style, the interaction variable between transformational leadership style and teacher orientation, and the outcome variable depersonalization burnout. The sixth moderation model included transformational leadership style, the interaction variable between transformational leadership style and teacher orientation, and the outcome variable personal accomplishment burnout.

Moderation Model Variability

The coefficients of determination, and R squares, which quantify how close the data are to the fitted regression line for each model, is displayed in Table 16. A total of 78.1% of the variability of emotional exhaustion in model 1, 78% of the variability of depersonalization in model 2, and 84.8% of the variability of personal accomplishment in model 3 can be explained by the interaction between teaching autonomy and teacher orientation.

Table 16

Model Summary: Influence of Moderator Interactions on Burnout

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate

M1 (EE, TA, TCert)	.884	.781	.772	.69504
M2 (DP, TA, TCert)	.883	.780	.771	.70310
M3 (PA, TA, TCert)	.921	.848	.842	.50517
M4 (EE, TFL, TCert)	.908	.825	.818	.62124
M5 (DP, TFL, TCert)	.906	.820	.813	.63593
M6 (PA, TFL, TCert)	.942	.888	.884	.43312

(EE=Emotional Exhaustion, TA=Teaching Autonomy, TCert= Teacher Orientation, DP=Depersonalization, TFL=Transformational Leadership, PA=Personal Accomplishment)

Moderation Models 1-3: Perceived Teaching Autonomy and Teacher Orientation

The overall moderation model (1) predicted a significant and large proportion (78.1%) of the variance in emotional exhaustion, $R^2 = .781$ $F(3,78) = 92.559$, $p < .001$. The results indicate that the direct effect of teaching autonomy on emotional exhaustion was significant, negative, had a large effect size, and explained approximately 30% of the variability in the model ($b = -.148$, $p < .001$, $sr^2 = .298$). The direct effect of teacher orientation on emotional exhaustion was not statistically significant and did not contribute to the variance in the model ($b = 1.081$, $p = .375$, $sr^2 = .021$). After controlling for these main effects, the interaction/moderator effect, $b = -.054$, $p = .099$, $sr^2 = .008$,

was not significant and it did not significantly contribute to the variance in the model.

These findings confirmed the null hypothesis that teacher orientation did not significantly

moderate the relationship between emotional exhaustion burnout and perceived teaching

autonomy (see Tables 17-18). Because the pattern of correlations seen between the

Model 1 variables suggested that a mediation analysis would better describe the

relationship between the variables, a mediation analysis was performed and will be

discussed later in the chapter.

Table 17

ANOVA Results for Moderation Models 1-3

Model		SS	Df	MS	F	R^2	P
1	Regression	134.141	3	44.714	92.559	.781	<.001
	Residual	37.681	78	.483			
	Total	171.822	81				
2	Regression	136.678	3	45.559	92.160	.780	<.001
	Residual	38.559	78	.494			
	Total	175.238	81				
3	Regression	111.091	3	37.030	145.105	.848	<.001
	Residual	19.905	78	.255			
	Total	130.996	81				

Table 18

Coefficients: Moderation Models 1-3 Teaching Autonomy X Teacher Orientation

Model		b	SE	β	t	P	sr^2
1	(Constant EE)	4.985	1.170		4.261	<.001	
	Interaction	-.054	.032	.766	1.671	.099	.008
	T Autonomy	-.148	.015	-1.228	-9.893	<.001	.298
	T Orientation	1.081	1.212	.373	.891	.375	.021
2	(Constant DP)	2.932	1.184		2.477	.015	
	Interaction	-.093	.033	1.314	2.863	.005	.023
	T Autonomy	-.151	.015	-1.239	-9.969	<.001	.280
	T Orientation	2.681	1.226	.917	2.186	.032	.013

	(Constant PA)	2.238	.850		2.632	.010	
3	Interaction	-.049	.023	-.801	-2.098	.039	.009
	T Autonomy	.107	.011	1.016	9.837	<.001	.195
	T Orientation	1.786	.881	.706	2.027	.046	.008

The overall moderation model (2) predicted a significant and large proportion (78%) of the variance in depersonalization, $R^2 = .780$, $F(3,78) = 92.160$, $p < .001$. The results indicated that the direct effect of teaching autonomy on depersonalization was statistically significant, negative, had a large effect size, and explained 28% of the variability in the model, $b = -.151$, $p < .001$, $sr^2 = .280$). The direct effect of teacher orientation on depersonalization was statistically significant, positive, had a small effect size, and explained approximately 2% of the variance in the model ($b = 2.681$, $p = .032$, $sr^2 = .021$). After controlling for these main effects, the interaction/moderator effect, $b = -.093$, $p = .005$, $sr^2 = .023$, was statistically significant, negative, had a small effect size and explained approximately 2% of the variance in the model. Based on these findings the null hypothesis was rejected as teacher orientation did significantly moderate the relationship between depersonalization burnout and perceived teaching autonomy (see Tables 17-19).

The interaction moderator effect significantly moderated the depersonalization and teaching autonomy relationship and was significant at both conditions of the moderator variable as displayed in Table 19. The Montessori condition ($b = -.0578$, $p = .0486$, $sr^2 = .265$) was statistically significant, negative, had a large effect size, and explained approximately 26% of the variance in the moderator model. The traditional condition ($b = -.1511$, $p < .001$, $sr^2 = .598$) was statistically significant, negative, had a

large effect size, and explained approximately 60% of the variance in the moderator

model. This is visually displayed in the graph in Figure 1.

Figure 1

*Moderation 2: Moderating Effect of Teacher Orientation on Teaching Autonomy and
Depersonalization Burnout*
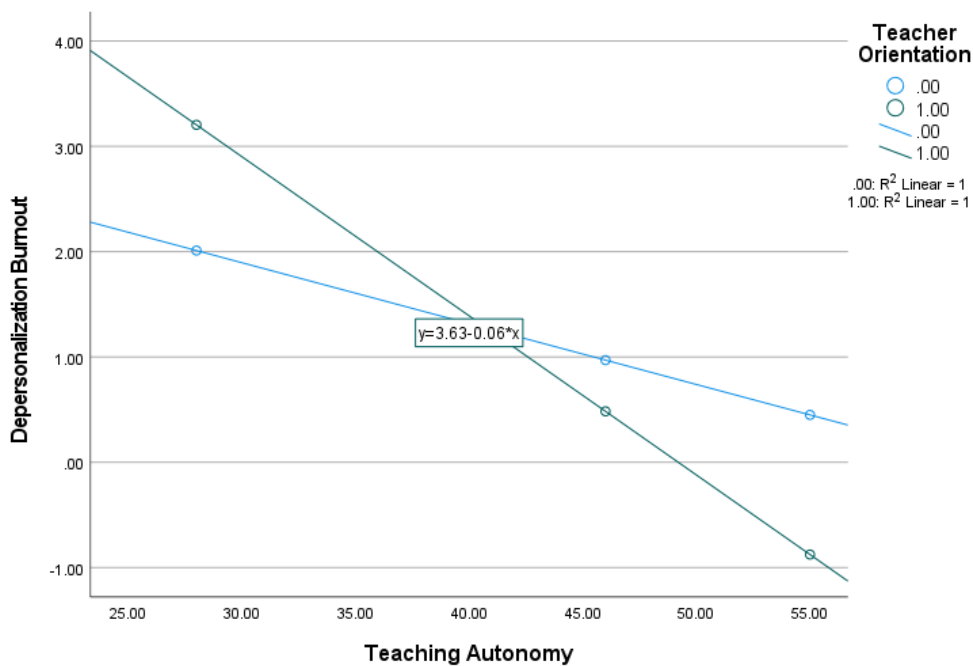
Table 19

Conditional Effects: Model 2

Teacher Orientation		*B*	*SE*	*T*	*P*	*sr²*
.00	Montessori	-.0578	.0289	-2.003	.049	.265
1.0	State	-.1511	.0152	-9.969	<.001	.598

The overall moderation model (3) predicted a significant and large proportion

(84.8%) of the variance in personal accomplishment burnout $R^2 = .848$, $F(3,78)$

$=145.105$, $p < .001$. The results indicated that the direct effect of teaching autonomy on

personal accomplishment burnout was statistically significant, positive, had a moderate effect size, and explained approximately 20% of the variability in the model, ($b = .107$, $p < .001$, $sr^2 = .195$). The direct effect of teacher orientation on personal accomplishment was statistically significant, positive, had a small effect size, and explained approximately .8% of the variance in the model ($b = 1.78$, $p = .046$, $sr^2 = .008$). After controlling for these main effects, the interaction/moderator effect, $b = -.049$, $p = .039$, $sr^2 = .009$, was statistically significant, negative, had a small effect size and explained approximately .9% of the variance in the model. Based on these findings the null hypothesis was rejected as teacher orientation did significantly moderate the relationship between personal accomplishment burnout and perceived teaching autonomy (see Tables 17-18).

The interaction moderator effect significantly moderated the personal accomplishment and teaching autonomy relationship and was significant at both conditions of the moderator variable as displayed in Table 20. The Montessori condition ($b = .0580$, $p = .006$, $sr^2 = .298$) was statistically significant, positive, had a large effect size, and explained approximately 30% of the variance in the moderator variable. The traditional condition of the moderator ($b = .1071$, $p < .001$, $sr^2 = .619$) was statistically significant, positive, had a large effect size, and explained approximately 62% of the variance in the moderator variable. This is visually displayed in the simple slopes graph in Figure 2.

Table 20

Conditional Effects: Model 3

Teacher Orientation	B	SE	T	P	sr^2

.00	Montessori	.0580	.0207	2.797	.006	.298
1.0	State	.1071	.0109	9.837	<.001	.619

Figure 2

Moderating Effect of Teacher Orientation on Teaching Autonomy and Personal Accomplishment
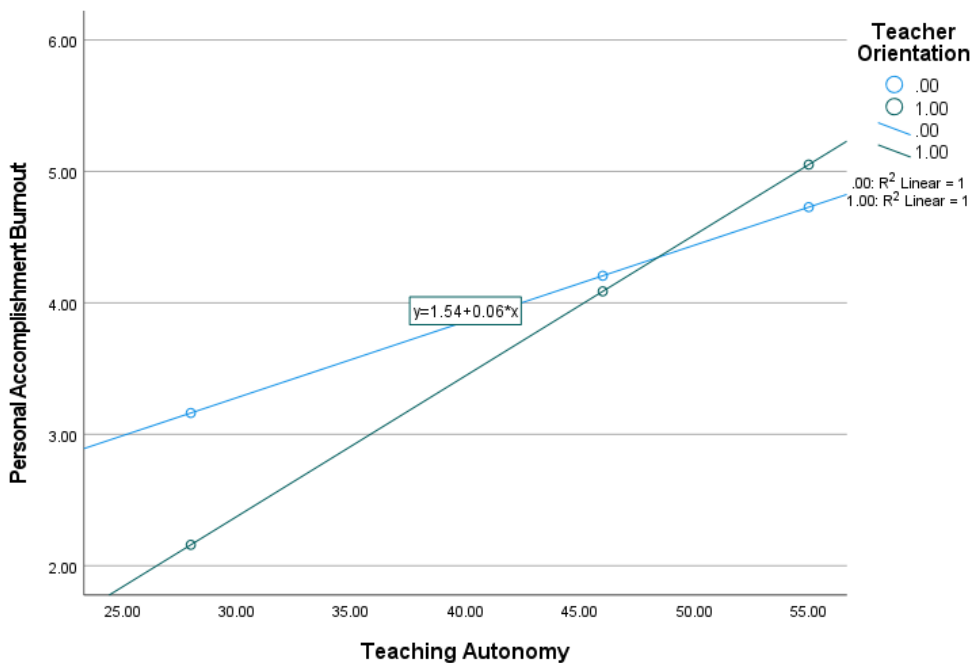
Mediation Analysis of Model 1

Figure 3

Path Analysis of Teacher Orientation, Teaching Autonomy, and Emotional Exhaustion
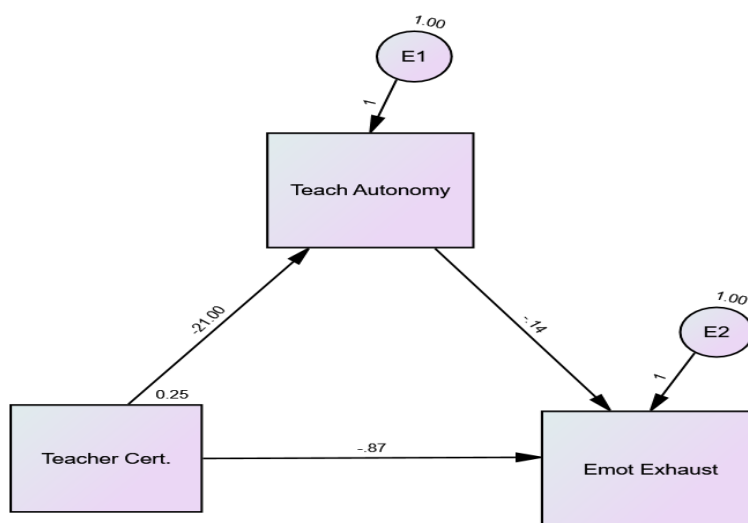
The interaction effect in the moderation analysis of Model 1, which included

emotional exhaustion (DV), teaching autonomy (IV) and teacher orientation (moderator)

was not significant, so a mediation analysis was performed to better describe the

relationship between the variables in the model. The four conditions necessary for

statistical mediation were met. 1) The predictor variable *X,* teacher orientation is

significantly correlated with the outcome variable Y, emotional exhaustion burnout *b* = -

.87 and 2) the predictor variable teacher orientation was significantly correlated with the

mediator variable teaching autonomy $b = -.21$(Path a), A multiple regression analysis

was performed in which teacher orientation (X) and teaching autonomy (M) were the

predictor variables and emotional exhaustion burnout (Y) was the outcome, 3) after

controlling for the relationship between the mediator (*M*) and the dependent variable (*Y*),

the relationship between *X* and *Y* (Path *c in* Figure 3) is reduced substantially (partial

mediation); and finally, 4) in the multiple regression analysis, the relationship between M

and Y remains statistically significant (Path *b* in the proposed model).

In this simple three variable model, and as depicted in Figure 3, the relationship

between *X* (Teacher Orientation) and *M* (Teaching Autonomy) Path *a*, is the simple

unstandardized regression coefficient, *b*. The relationship between the mediator, teaching

autonomy, and the outcome variable, emotional exhaustion, Path *b*, is the unstandardized

regression coefficient obtained from a multiple regression model in which emotional

exhaustion is regressed on teacher orientation. Path *b* represents the relationship between

the moderator, teaching autonomy, and the outcome variable, emotional exhaustion after

controlling for teacher orientation. Path *c*, also obtained from this multiple regression

model, represents the relationship between teacher orientation and emotional exhaustion

after controlling for teaching autonomy. Path *c* is referred to as the direct effect of X on

Y.

The simple bivariate correlation coefficients presented in Table 21 indicate that

the relationship between teacher orientation and teaching autonomy was statistically

significant, negative, and represented a large effect size (r (82) $= -.876$, $r^2 = .773$. $p <$

.001), accounting for approximately 77% of the variability in teaching autonomy. When

teaching autonomy is regressed on teacher orientation the resulting unstandardized

regression coefficient (b), is statistically significant ($b = -21.00$, $SE = .129$, $p < .001$) –

See Table 22, Model 1. This coefficient is Path a in the mediational model and

represents the impact of teacher orientation on teaching autonomy.

Teacher orientation is significantly and positively correlated with emotional

exhaustion (r (82) = .689, r^2 = .475, $p < .001$), accounting for approximately 47% of the

variability in emotional exhaustion and represents a large effect size. Teaching autonomy

is significantly and negatively correlated with emotional exhaustion (r (82) = -.867, r^2 =

.752, $p < .001$), accounting for approximately 75% of the variability in emotional

exhaustion and represents a large effect size.

Table 21

Means, Standard Deviations, and Intercorrelations

			Pearson r	
$N = 82$	M	SD	(2)	(3)
Teaching Autonomy (1)	42.6	12.06	-.876*	-.867*
Teacher Orient (2)	.487	.502		.689*
Emotional Exhaustion (3)	2.10	1.45		

* p < .001.

The mediational model was tested using an SPSS (version 27) regression analysis

procedure and an internet version of Sobel's test to assess the indirect effect of teacher

orientation on emotional exhaustion via teaching autonomy (See Appendix H).

In the multiple regression analysis, the variable emotional exhaustion was the

outcome, or dependent variable, teacher orientation was the predictor, or independent

variable, and teaching autonomy was the mediator variable. The overall results of the

multiple regression analysis indicated that the variables teaching autonomy and teacher

orientation were significant predictors of emotional exhaustion ($R = .879$, $R^2 = .773$, ($F(2$,

$79) = 134.395$, $p < .001$), accounting for approximately 77% of the variance in emotional

exhaustion and representing a large effect size.

The unstandardized regression coefficients (b) for each path in the model are

reported in Table 22, Model 2, and depicted in Figure 3. The impact of teacher

orientation on teaching autonomy (Path a in Figure 2) was statistically significant and

negative indicating that decreasing levels of teaching autonomy are associated with

teacher orientation in ($b = -21.00$, $SE = 1.29$, $p < .001$). Based on the results for the

multiple regression analysis, the impact of teaching autonomy on emotional exhaustion

(Path b) was strong and statistically significant ($b = -.137$, $SE = .013$, $p = .000$, $sr^2 =$

.298) This finding supports the hypothesis that teaching autonomy has a significant

impact on emotional exhaustion. Lastly, after controlling for the effects of teaching

autonomy, the impact of teacher orientation on emotional exhaustion (Path c) ($b = -.874$,

$SE = .322$, $p = .008$, $sr^2 = .021$) accounting for approximately 2% of the variability in EE

scores (see Table 22 Model 2). has been reduced significantly thus it can be concluded

that the effect of teacher orientation on emotional exhaustion is substantially mediated

through teaching autonomy, though the effect size is very small.

As noted above, the indirect effects of teacher orientation on emotional

exhaustion via teaching autonomy can be expressed as an unstandardized regression

coefficient (b) by multiplying the unstandardized regression coefficient for path a (-

21.00) times the unstandardized regression coefficient for Path *b* (-.137). Which, in the

present example is -21.00 x -.137 (*b* indirect effect =) 2.877. The significance of the indirect

effect was further assessed using Sobel's calculator. The results of Sobel's test indicated

that the indirect effect (of teacher orientation on emotional exhaustion via teaching

autonomy) was statistically significant (*b* = 2.877, *Z* = 8.84, *p* < .001).

Table 22

Regression Coefficients for the Mediator Model

Model 1: Regression of Teacher Orientation on Teaching Autonomy

	Regression Coefficients					
	B	*SE*	*R*	*T*	*P*	r^2
Teacher Orientation (Path *a*)	-21.00	1.29	.876	-16.23	<.001	.767

DV = Teaching Autonomy

Model 2: Regression of Emotional Exhaustion on Teaching Autonomy and Orientation

	Regression Coefficients					
	B	*SE*	B	*T*	*P*	sr^2
Teacher Orientation (Path *c*)	-.874	.322	-.302	-2.716	.008	.021
Teaching Autonomy (Path *b*)	-0.137	.013	-1.131	-10.18	<.001	.298

DV = Emotional Exhaustion

Moderation Models 4-6: Perceived Transformational Leadership Style and Teacher Orientation

     The overall moderation model (4) predicted a significant and large proportion

(82.5%) of the variance in emotional exhaustion, $R^2 = .825$, $F(3,78) = 122.400$, *p* < .001.

The results indicated that the direct effect of transformational leadership style on emotional exhaustion was statistically significant, negative, had a large effect size, and explained approximately 32% of the variability in the model, (b = -.1.837, p < .001, sr^2 = .323). The direct effect of teacher orientation on emotional exhaustion was not statistically significant, b = -.127, p = .592, sr^2 = .001, and did not contribute to the variance in the model. After controlling for these main effects, the interaction/moderator effect, b = 1.067, p < .001, sr^2 = .034, was statistically significant, positive, had a small effect size, and explained approximately 3% of the variance in the model. Based on these findings the null hypothesis was rejected as teacher orientation did significantly moderate the relationship between transformational leadeship style and emotional exhaustion burnout (see Tables 24-25).

The interaction moderator effect significantly moderated the relationship between transformational leadership style and emotional exhaustion burnout and was also significant at both conditions of the moderator variable. The Montessori condition was statistically significant, negative, had a large effect size, and explained approximately 34% of the variance in the model (b = -.770, p = .001, sr^2 = .339). The traditional condition of the moderator was statistically significant, negative, had a large effect size and explained approximately 72% of the variance in the model (b = -1.837, p < .001, sr^2 = .722). This is visually displayed in the simple slopes graph in Figure 4.

Figure 4

The Moderating Effect of Teacher Orientation on Transformational Leadership Style and Emotional Exhaustion
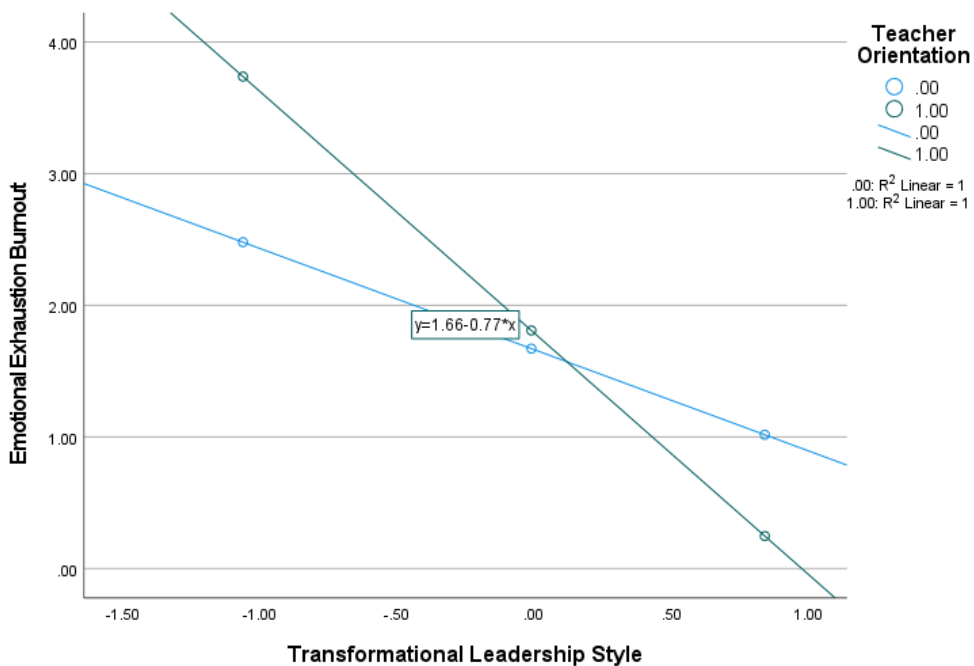
Table 23

Conditional Effects: Model 4

Teacher Orientation		B	SE	T	P	sr^2
.00	Montessori	-.7700	.2258	-3.410	.001	.339
1.0	State	-1.837	.1530	-12.00	<.001	.722

Table 24

Coefficients: Moderation Models 4-6 Transformational Leadership Style X Teacher Orientation

Model		B	SE	B	T	P	sr^2
4	(Constant EE)	1.664	.184		9.062	<.001	

		B	Std Error	Beta	t	p	sr^2
	Interaction	1.067	.273	.340	3.913	<.001	.034
	TFL Style	-1.837	.153	-1.133	-12.00	<.001	.323
	T Orientation	.127	.236	.044	-.539	.592	.001
5	(Constant DP)	.884	.188		4.705	<.001	
	Interaction	1.401	.279	.442	5.020	<.001	.060
	TFL Style	-1.852	.157	-1.131	11.83	<.001	.323
	T Orientation	.385	.242	.132	1.595	.115	.006
	(Constant PA)	4.286	.128		33.486	<.001	
6	Interaction	-.894	.190	-.326	4.700	<.001	.032
	TFL Style	.463	.157	.958	2.940	<.001	.231
	T Orientation	-.724	.165	-.286	-4.398	<.001	.027

Table 25

ANOVA Results for Moderation Models 4-6

Model		SS	Df	MS	F	R^2	P
4	Regression	141.718	3	47.239	122.400	.825	<.001
	Residual	30.104	78	.386			
	Total	171.822	81				
5	Regression	143.694	3	47.898	118.441	.820	<.001
	Residual	31.544	78	.404			
	Total	175.238	81				
6	Regression	116.364	3	38.788	206.770	.888	<.001
	Residual	14.632	78	.188			
	Total	130.996	81				

The overall moderation model (5) predicted a significant and large proportion (82%) of the variance in depersonalization burnout, $R^2 = .820$, $F(3,78) = 118.441$, $p < .001$. The results indicated that the direct effect of transformational leadership style on depersonalization was statistically significant, negative, had a large effect size, and explained approximately 32% of the variability in the model, ($b = -.1.852$, $p < .001$, $sr^2 = .323$). The direct effect of teacher orientation on depersonalization was not statistically significant, $b = .385$, $p = .115$, $sr^2 = .006$, and did not contribute to the variance in the

model. After controlling for these main effects, the interaction/moderator effect, $b =$

1.401, $p < .001$, $sr^2 = .060$ was statistically significant, positive, had a small effect size,

and explained approximately 6% of the variance in the model. Based on these findings

the null hypothesis was rejected as teacher orientation did significantly and positively

moderate the relationship between transformational leadeship style and depersonalization

burnout (see Tables 24-25).

The interaction moderator effect significantly moderated the relationship between

transformational leadership style and depersonalization burnout but was not significant at

both conditions of the moderator variable (see Table 26). The Montessori condition ($b = -$

.4511, $p = .0545$, $sr^2 = .206$) was not statistically significant. The traditional condition of

the moderator was statistically significant, negative, had a large effect size, and explained

approximately 69% of the variance in the model ($b = -1.852$, $p < .001$, $sr^2 = .689$). This is

visually displayed in the simple slopes graph in Figure 5.

Figure 5

Moderating Effect of Teacher Orientation on Transformational Leadership Style and Depersonalization
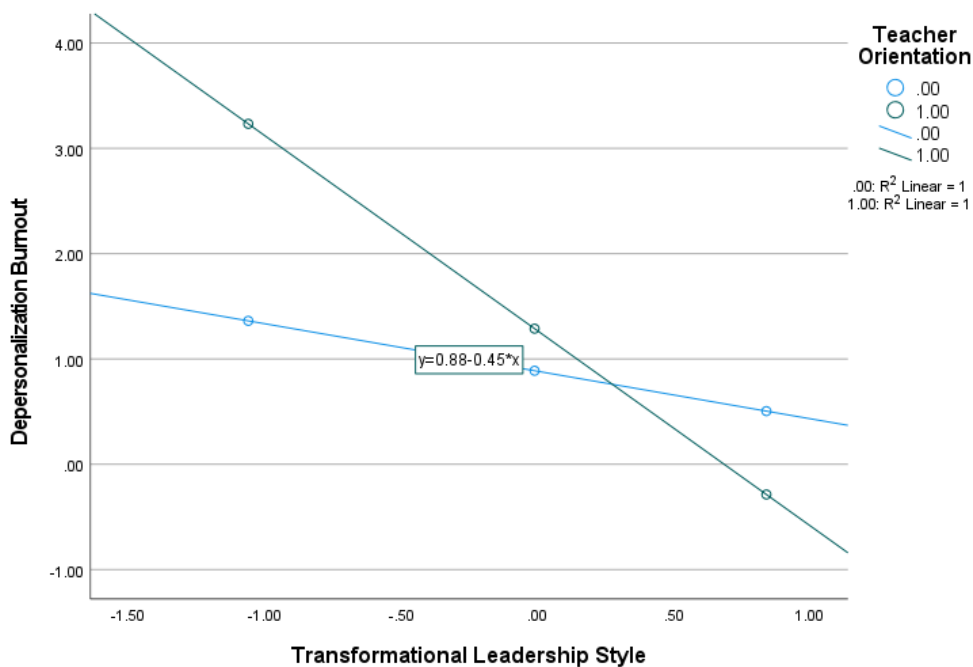
Table 26

Conditional Effects: Model 5

Teacher Orientation		*B*	*SE*	*T*	*P*	*sr²*
.00	Montessori	-.4511	.2311	2.792	.054	.206
1.0	State	-1.852	.1566	-11.829	<.001	.689

The overall moderation model (6) predicted a significant and large proportion

(88.8%) of the variance in personal accomplishment burnout $R^2 = .888$, $F(3,78) =$

206.770, $p < .001$ (see Table 25). The results indicated that the direct effect of

transformational leadership style on personal accomplishment was statistically

significant, positive, had a moderate-large effect size, and explained approximately 23%

of the variability in the model, ($b = .463$, $p < .001$, $sr^2 = .231$) (see Table 24). The direct

effect of teacher orientation on personal accomplishment was statistically significant,

negative, had a small effect size, and explained approximately 3% of the variance in the

model ($b = -.724, p < .001, sr^2 = .027$) (see Table 24). After controlling for these main effects, the interaction/moderator effect, $b = -.894$, $p < .001$, $sr^2 = .032$ was statistically significant, negative, had a small effect size, and explained approximately 3% of the variance in the model. Based on these findings the null hypothesis was rejected as teacher orientation did significantly moderate the relationship between transformational leadeship style and personal accomplishment burnout (see Tables 24-25).

The interaction moderator effect significantly moderated the relationship between transformational leadership style and personal accomplishment burnout and was not significant at both conditions of the moderator variable as displayed in Table 27. The Montessori condition was not significant($b = -.7700, p = .054, sr^2 = .242$). The traditional condition of the moderator was significant, negative, had a large effect size, and explained 76% of the variance in the model ($b = -1.837, p < .001, sr^2 = .760$). This is visually displayed in the simple slopes graph in Figure 6.

Figure 6

Moderating Effect of Teacher Orientation on Transformational Leadership Style and Personal Accomplishment
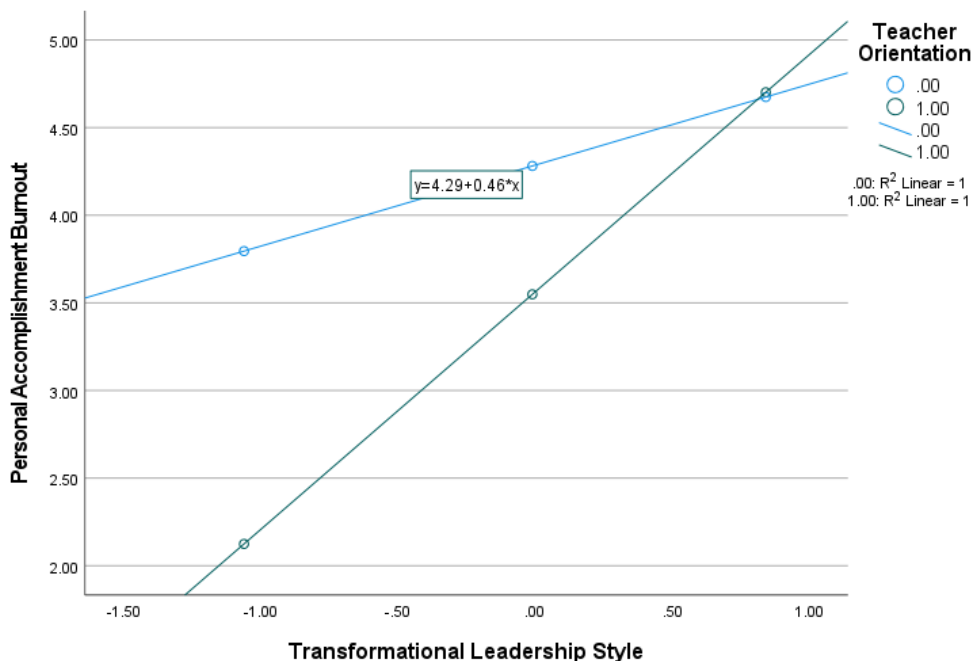

Table 27

Conditional Effects: Model 6

Teacher Orientation		B	SE	T	P	sr^2
.00	Montessori	.4628	.1574	2.940	.043	.242
1.0	State	1.356	.1067	12.718	<.001	.760

Summary

A series of multiple regressions and moderation analyses were performed to determine if perceived teaching autonomy and transformational leadership style were associated with the three domains of burnout in teachers and to determine if teacher orientation was a moderator in any of the relationships. The results of the multiple regression analyses revealed that perceived teaching autonomy and transformational

leadership style were both strong significant negative predictors of emotional exhaustion, depersonalization, and personal accomplishment burnout. The moderation analyses results revealed that teacher orientation did not moderate the relationship between emotional exhaustion burnout and perceived teaching autonomy (model 1). A mediation model better described the relationship between the model 1 variables indicating that teaching autonomy significantly mediated the relationship between teacher orientation and emotional exhaustion burnout. The interaction effect in models 2-6 were all significant. Teacher orientation significantly moderated the relationships between depersonalization burnout and perceived teaching autonomy (model 2), between personal accomplishment burnout and perceived teaching autonomy (model 3), between emotional exhaustion burnout and transformational leadership style (model 4) between depersonalization burnout and transformational leadership style (model 5), and between personal accomplishment burnout and transformational leadership style (model 6). Chapter 5 includes interpretations of the findings, limitations of the study, implications for social change, and recommendations for future research.

Chapter 5: Interpretations, Recommendations and Conclusions

Introduction

The purpose of the present study was to assess the relationships among autonomy and supportive leadership and burnout in public elementary teachers and to assess possible differences in burnout patterns between Montessori and traditional teachers. Teaching is consistently among the top three most stressful professions, according to the results of ranking studies across eighty occupations (Johnson et al., 2005; Wiggins, 2015). Though there are multiple factors that contribute to teacher stress and burnout, autonomy and supportive leadership are considered among the most prevalent protective factors (Greenberg et al., 2016). Burnout among teachers is a serious problem because of the negative consequences associated with it, including serious health disorders, increased absenteeism, intention to quit, increased healthcare costs, acute illness, declining student achievement, destabilized classroom environments, and attrition (Alliance for Excellent Education, 2014; Hastings & Agrawal, 2015; Klusmann et al., 2016; Roelen, et al., 2015; Salvagioni et al., 2017). The purpose of the present research was to address a gap in the literature by examining the relationships between burnout and teachers' perceptions of autonomy and supportive leadership in Montessori versus traditional teachers. As this has not yet been measured, it is unknown if there are significant differences in these relationships between these diverse educational methods.

A quantitative nonexperimental cross-sectional survey research design was used to examine the effect of two predictor (independent) variables on the three outcome (dependent) variables. Online surveys were distributed to U.S. public elementary teachers

with a minimum of 1 year of public-school teaching experience, who taught Grades 4, 5, and/or 6, and held either Traditional-state certification, Montessori certification, or both. The two predictor variables were perceived teaching autonomy and perceived transformational (supportive) leadership style. The three outcome variables were emotional exhaustion, depersonalization, and personal accomplishment burnout.

A series of multiple regression analyses were performed to determine if perceived teaching autonomy and transformational leadership style were associated with the three domains of burnout in teachers and to determine if teacher orientation was a moderator or mediator in any of the relationships. The results of the multiple regression analyses revealed that perceived teaching autonomy and transformational leadership style were both strong significant negative predictors of emotional exhaustion, depersonalization, and personal accomplishment burnout. The moderation analyses results revealed that teacher orientation did not moderate the relationship between emotional exhaustion burnout and perceived teaching autonomy (Model 1). A mediation model better described the relationship between the Model 1 variables, indicating that teaching autonomy significantly mediates the relationship between teacher orientation and emotional exhaustion burnout. The interaction effects in Models 2 through 6 were all significant. Teacher orientation significantly moderated the relationships between the three dependent variables and the two independent variables. In this chapter, the interpretations of the research findings are discussed, followed by limitations of the study, recommendations for future research, and implications for social change.

Interpretation of Findings

Perceived Teaching Autonomy, Transformational Leadership Style, and Burnout

Research Question 1 asked: To what extent does perceived autonomy, as measured by the TAS, relate to the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment), as measured by MBI-ES subscales among elementary teachers? Research Question 3 asked: To what extent does perceived supervisor leadership style, as measured by the transformational leadership scale of the MLQ, relate to the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment), as measured by MBI-ES subscales, among elementary teachers? In all three multiple regression models, the null hypotheses were rejected, indicating that higher levels of perceived teaching autonomy and transformational leadership style predict lower levels of emotional exhaustion, depersonalization, and personal accomplishment burnout.

Multiple Regression Analyses

In the emotional exhaustion, teaching autonomy, and transformational leadership style model, emotional exhaustion was significantly, negatively, and strongly related to both teaching autonomy and transformational leadership style. The null hypothesis was rejected, indicating that the combined influence of the two independent variables, teaching autonomy and transformational leadership style, significantly predicted emotional exhaustion. These findings suggested that higher levels of both perceived teaching autonomy and transformational leadership style were associated with lower levels of emotional exhaustion burnout. Transformational leadership style was the

strongest predictor of emotional exhaustion burnout. These findings are generally consistent with previous research and the theoretical framework used for the present study; the strength of the predictors that emerged in the data were consistent with prior studies that indicated small to moderate predictive strength of transformational leadership style and teaching autonomy for emotional exhaustion burnout.

In the depersonalization, teaching autonomy, and transformational leadership style model, depersonalization was significantly, negatively, and strongly related to both teaching autonomy and transformational leadership style. The null hypothesis was rejected, as the results suggested that increases in levels of both perceived teaching autonomy and transformational leadership style were associated with decreased levels of depersonalization burnout. Transformational leadership style accounted for more of the variance in the depersonalization burnout predictor model than teaching autonomy. These findings are generally consistent with previous research and the theoretical framework used for the present study; the strength of the predictors that emerged in the data were consistent with prior studies that indicated small to moderate predictive strength of transformational leadership style and teaching autonomy for depersonalization burnout.

In the personal accomplishment, teaching autonomy, and transformational leadership style model, personal accomplishment was significantly and positively related to teaching autonomy and transformational leadership style. The null hypothesis was rejected, indicating that the combined influence of the two independent variables, teaching autonomy and transformational leadership style, significantly predicted personal accomplishment. The null hypothesis was rejected as the results suggested that higher

levels of both perceived teaching autonomy and transformational leadership style were associated with higher levels of personal accomplishment, which resulted in lower levels of personal accomplishment burnout. Transformational leadership style accounted for more of the variance in the personal accomplishment burnout predictor model than teaching autonomy. These findings are generally consistent with previous research and the theoretical framework used for the present study; the strength of the predictors that emerged in the data were consistent with prior studies that indicated small to moderate predictive strength of transformational leadership style and teaching autonomy for personal accomplishment burnout.

The literature suggests that perceived teaching autonomy was negatively correlated with emotional exhaustion and depersonalization and positively correlated with personal accomplishment and had a moderately small effect size (Skaalvik and Skaalvik, 2009). They also found that teaching autonomy was negatively correlated with emotional exhaustion and depersonalization and positively correlated with personal accomplishment and had a small effect size in an SEM analysis controlling for work overload, discipline problems, and relations with both colleagues and the school principal, (Skaalvik and Skaalvik, 2010).

Moderation Analyses

To answer Research Question 2: To what extent does teacher orientation moderate the relationship between perceived autonomy and the components of burnout (emotional exhaustion, depersonalization, and personal accomplishment) in elementary teachers? and Research Question 4: To what extent does teacher orientation moderate the

relationship between perceived supervisor leadership style and the components of

burnout (emotional exhaustion, depersonalization, and personal accomplishment) among

elementary teachers? Six moderation analyses were conducted. The six moderation

models determined the moderator effect of teacher orientation, between the two

predictors and the three outcome variables.

Of the six moderation models, five had a significant moderator effect. Model 1

did not have a significant moderator effect. Though the overall moderation model

predicted a significant and large proportion of the variance in emotional exhaustion and

indicated that the direct effect of teaching autonomy on emotional exhaustion explained

approximately 30% of the variability in the model, the direct effect of teacher orientation

on emotional exhaustion was not statistically significant and did not contribute to the

variance in the model. Thus, the findings confirmed the null hypothesis that teacher

orientation did not significantly moderate the relationship between emotional exhaustion

burnout and perceived teaching autonomy. Because the pattern of correlations seen

between the Model 1 variables suggested that a mediation analysis would better describe

the relationship between the variables, a mediation analysis was performed and will be

discussed later in the chapter.

The overall moderation Model (2) predicted a significant and large proportion of

the variance in depersonalization and indicated that the direct effect of teaching

autonomy on depersonalization explained 28% of the variability in the model, and the

direct effect of teacher orientation on depersonalization was statistically significant and

explained approximately 2% of the variance in the model. Thus, the null hypothesis was

rejected, as teacher orientation did significantly moderate the relationship between depersonalization burnout and perceived teaching autonomy.

The interaction moderator effect significantly moderated the depersonalization and teaching autonomy relationship and was significant at both conditions of the moderator variable. The Montessori condition was statistically significant, negative, had a large effect size, and explained approximately 26% of the variance in the moderator variable. The traditional teacher condition was statistically significant, negative, and explained approximately 60% of the variance in the moderator variable. The traditional teacher mean depersonalization scores were higher (2.61) than the Montessori scores (.571), and the moderator effect was greater in tradtional teachers (60%) compared to Montessori teachers (26%). The impact of teaching autonomy on depersonalization burnout was greater in traditional than in Montessori teachers because of their higher levels of burnout and the lower level of teaching autonomy extended to them. The mean autonomy score in Montessori teachers was 52.90, and 31.90 in traditional teachers. The Montessori condition buffered the relationship via higher perceived teaching autonomy and reduced depersonalization burnout levels. The impact of perceived teaching autonomy on the depersonalization burnout levels of traditional teachers is greater because of the lower level of teaching autonomy they perceived to be extended to them. In Model 2, teaching autonomy significantly predicted depersonalization burnout at both conditions of the moderator variable, Montessori $b = -.0578$ and traditional $b = -.1511$.

Moderation Model 3 predicted a significant and large proportion (84.8%) of the variance in personal accomplishment burnout and indicated that the direct effect of

teaching autonomy on personal accomplishment burnout was statistically significant and explained approximately 20% of the variability in the model. The direct effect of teacher orientation on personal accomplishment was statistically significant and explained approximately .8% of the variance in the model. Thus, the null hypothesis was rejected, as teacher orientation significantly moderated the relationship between personal accomplishmenr burnout and perceived teaching autonomy.

The interaction moderator effect significantly moderated the personal accomplishment and teaching autonomy relationship and was significant at both conditions of the moderator variable. The Montessori condition was statistically significant and explained approximately 30% of the variance in the moderator variable. The traditional condition of the moderator was statistically significant and explained approximately 62% of the variance in the moderator variable. The traditional teacher mean personal accomplishment scores were lower (lower PA scores result in higher PA burnout) than the Montessori teacher scores, and the variation contributed by traditional teacher orientation in the model was greater than that contributed by Montessori teacher orientation. Montessori teacher orientation buffered the relationship via higher levels of teaching autonomy that increased personal accomplishment and reduced burnout to a level in the lower range of the norm. The impact of perceived teaching autonomy on the personal accomplishment burnout levels of traditional teachers is greater because of the lower level of teaching autonomy they perceived to be extended to them. In Model 3, teaching autonomy significantly predicted personal accomplishment burnout at both conditions of the moderator variable, Montessori $b = .0580$ and traditional $b = .1071$.

The interaction moderator effect significantly moderated the relationship between transformational leadership style and emotional exhaustion burnout and was significant at both conditions of the moderator variable. The Montessori condition was statistically significant, negative, had a large effect size, and explained approximately 34% of the variance in the model. The traditional condition of the moderator was statistically significant, negative, had a large effect size, and explained approximately 72% of the variance in the model.

The traditional teacher mean emotional exhaustion scores were higher than the Montessori teacher scores, and the moderator effect was higher in tradtional teachers vs. in Montessori teachers. Teacher orientation moderated the relationship via higher levels of perceived transformational leadership style that reduced emotional exhaustion burnout scores to a level in the lower range of the norm in this sample of Montessori teachers. A greater moderation effect was seen in traditional teachers, which resulted from their perception of lower levels of TFL style and resulted in higher emotional exhaustion burnout scores. The impact of perceived TFL style on the emotional exhaustion burnout levels of traditional teachers was greater because of the lower level of support they perceived extended to them. Montessori teachers experienced a lower moderation effect as a result of their perception of higher levels of TFL support that buffered the TFL-burnout relationship and resulted in lower levels of emotional exhaustion burnout. In Model 4, transformational leadership style significantly predicted emotional exhaustion burnout at both conditions of the moderator variable, Montessori b = -.7700 and traditional b = -1.837.

Moderation Model 4 predicted a significant and large proportion (82.5%) of the variance in emotional exhaustion and indicated that the direct effect of transformational leadership style on emotional exhaustion was statistically significant, negative, had a large effect size, and explained approximately 32% of the variability in the model. Thus, the null hypothesis was rejected, as teacher orientation significantly moderated the relationship between emotional exhaustion burnout and perceived transformational leadership style.

The interaction moderator effect significantly moderated the relationship between transformational leadership style and emotional exhaustion burnout and was significant at both conditions of the moderator variable. The Montessori condition was statistically significant, negative, had a large effect size, and explained approximately 34% of the variance in the model. The traditional condition of the moderator was statistically significant, negative, had a large effect size and explained approximately 72% of the variance in the model.

The traditional teacher mean emotional exhaustion scores were higher than the Montessori teacher scores, and the moderator effect was higher in tradtional teachers vs. in Montessori teachers. Teacher orientation moderated the relationship via higher levels of perceived transformational leadership style that reduced emotional exhaustion burnout scores to a level in the lower range of the norm in this sample of Montessori teachers. A greater moderation effect was seen in traditional teachers which resulted from their perception of lower levels of TFL style and resulted in higher emotional exhaustion burnout scores. The impact of perceived TFL style on the emotional

exhaustion burnout levels of traditional teachers was greater because of the lower level of support they perceived extended to them. Montessori teachers experienced a lower moderation effect as a result of their perception of higher levels of TFL support that buffered the TFL-burnout relationship and resulted in lower levels of emotional exhaustion burnout. In model 4, transformational leadership style significantly predicted emotional exhaustion burnout at both conditions of the moderator variable, Montessori b = -.7700 and traditional b = -1.837.

Moderation Model 5 predicted a significant and large proportion (82%) of the variance in depersonalization burnout, which indicated that the direct effect of transformational leadership style on depersonalization was statistically significant, negative, had a large effect size, and explained approximately 32% of the variability in the model, and the direct effect of teacher orientation on depersonalization was not statistically significant. The interaction/moderator effect was statistically significant with a small effect size, and explained approximately 6% of the variance in the model. Based on these findings the null hypothesis was rejected as teacher orientation did significantly moderate the relationship between transformational leadeship style and depersonalization burnout.

The interaction moderator effect significantly moderated the relationship between transformational leadership style and depersonalization burnout but was not significant at the Montessori condition. The traditional condition of the moderator was statistically significant with a large effect size, and explained approximately 69% of the variance in the model. The traditional teacher mean depersonalization scores were higher than the

Montessori teacher scores and the moderator effect was greater in tradtional teachers and was non significant in Montessori teachers. Teacher orientation moderated the relationship between depersonalization burnout and transformational leadership style and reduced depersonalization burnout scores to a level in the lower range of the norm in Montessori teachers. The Montessori teacher mean TFL score was 2.85 vs traditional teacher mean TFL score of 1.43. Traditional teacher orientation accounted for greater variance in the model which reflected their perception of lower levels of TFL style that resulted in higher depersonalization burnout scores. The impact of perceived TFL style on the depersonalization burnout levels of Montessori teachers was not significant as a result of their perception of higher levels of TFL support which buffered the TFL-burnout relationship and resulted in lower levels of depersonalization burnout. In model 5, transformational leadership style significantly predicted depersonalization burnout at the traditional condition of the moderator, b = -1.832, but not at the Montessori condition, b = -.4511.

Moderation Model 6 predicted a significant and large proportion (88.8%) of the variance in personal accomplishment burnout, the results indicated that the direct effect of transformational leadership style on personal accomplishment was statistically significant, positive, had a moderate-large effect size, and explained approximately 23% of the variability in the model. The direct effect of teacher orientation on personal accomplishment was statistically significant, had a small effect size, and explained approximately 3% of the variance in the model. The interaction/moderator effect was statistically significant and explained approximately 3% of the variance in the model.

Based on these findings the null hypothesis was rejected as teacher orientation significantly moderated the relationship between transformational leadeship style and personal accomplishment burnout.

The interaction moderator effect significantly moderated the relationship between transformational leadership style and personal accomplishment burnout but was not significant at both conditions of the moderator variable. The Montessori condition was not significant, but the traditional condition of the moderator was significant, had a large effect size, and explained 76% of the variance in the model.

The traditional teacher mean personal accomplishment scores were lower (2.57) than the Montessori teacher scores (4.60) and the moderator effect was higher (~76% of the variance in the model) in tradtional teachers vs. a non significant level in Montessori teachers. Montessori teachers had mean TFLscores of 2.80 vs traditional teachers mean scores of 1.43. Transformational leadership style buffered the relationship via higher levels of TFL (in Montessori teachers) such that the impact on personal accomplishment increased thus burnout scores were reduced to a corresponding level, in the lower range of the norm, in this sample of Montessori teachers. The personal accomplishment scores for traditional teachers in this sample was 2.57 with correspondingly high levels of personal accomplishment burnout. The impact of perceived teaching autonomy on the personal accomplishment burnout levels of traditional teachers was greater because of the lower level of transformational leadership style they perceived in their principals. In model 6, transformational leadership style significantly predicted personal

acccomplishment burnout at the traditional condition of the moderator, b = -1.832, but not at the Montessori condition, b = -.4511.

The moderating effect of teacher orientation was significant in all five models (Models 2-6). In model 2 teacher orientation significantly moderated the relationship between teaching autonomy and depersonalization burnout and in model 3 it significantly moderated the relationship between teaching autonomy and personal accomplishment burnout. In both models the impact of teaching autonomy on burnout was greater in traditional teachers than in Montessori teachers because of their lower levels of autonomy. As levels of teaching autonomy increase, levels of burnout decrease. Moving from traditional orientation to Montessori orientation the impact decreases as the levels of autonomy are higher in Montessori teachers buffering the effect of burnout. The variability accounted for in the moderation models by traditional teacher orientation was greater than in Montessori teachers because they had less variability to effect because of the buffering effect of higher levels of teaching autonomy.

In Models 4-6 teacher orientation significantly moderated the relationship between transformational leadership style and emotional exhaustion burnout (Model 4), depersonalization burnout (Model 5), and personal accomplishment burnout (Model 6). In all three models the impact of perceived transformational leadership style on burnout was greater in traditional than in Montessori teachers. As levels of transformational leadership style increase, levels of burnout decrease. From traditional to Montessori orientation the impact decreases and burnout levels decrease because of the buffering effect of greater transformational leadership style perceived by Montessori teachers. The

variability accounted for in the moderation models by traditional teacher orientation was greater than in Montessori teachers as they had less variability to effect because of the buffering effect of greater transformational leadership style they perceived in their school leaders. When perceived teaching autonomy and transformational leadership style were controlled for in these models the buffering advantages experienced by Montessori teachers, reflected in the data from all five moderation analyses, were eliminated and their rate of burnout increased to levels higher than those found in traditional teachers. The perceptions of Montessori teachers of greater teaching autonomy and transformational leadership behaviors (supportive leadership) in their principals may serve as a buffer against chronic stress and burnout. Montessori teachers experiencing actual diminishment of these buffers in their school environments may experience burnout in the three dimensions similat to that experienced by traditional teachers.

When teaching autonomy was controlled for in model 2, depersonalization burnout increased approximately 400% from $b = -.707$ to $b = 2.044$. In model 3 personal accomplishment decreased approximately 200% from $b = -.002$ to $b = -2.030$ increasing personal accomplishment burnout at a corresponding level. In model 4 emotional exhaustion burnout increased approximately 200% from $b = -.136$ to $b = 1.995$. In model 5 depersonalization burnout increased approximately 200% from $b = .040$ to $b = 2.044$. In model 6 personal accomplishment decreased approximately 300% from $b = -.503$ to $b = -2.030$ increasing personal accomplishment burnout at a corresponding level. There is a strong relationship between the higher levels of teaching autonomy and supportive transformational leadership style found in Montessori teachers and the lower levels of

burnout in all three dimensions. When this advantage is removed Montessori teachers

exhibit higher levels of burnout across the three dimensions.

Table 28

Coefficients: Moderation Models 2-6 Controlled for Independent Variables

Model		b	SE	β	t	P	sr^2
2	DP, TA, TO	-.707	.336	-.242	-2.102	.039	.013
	DP & TO (IVC)	2.044	.234	.669	8.737	<.001	.447
3	PA, TA, TO	-.002	.169	-.803	-.011	<.001	.645
	PA & TO (IVC)	-2.030	.236	-.001	-12.037	.992	.000
4	EE, TFL, TO	-.136	.246	-.047	-.554	.581	.000
	EE & TO (IVC)	1.995	.235	.689	8.503	<.001	.474
5	DP, TFL, TO	.040	.265	.014	.149	.882	.000
	DP & TO (IVC)	2.044	.234	.699	8.737	<.001	.489
6	PA, TFL, TO	-.503	.178	-.199	-2.834	.006	.014
	PA & TO (IVC)	-2.030	.169	-.803	-12.037	<.001	.645

(EE=Emotional Exhaustion, TA=Teaching Autonomy, TO= Teacher Orientation, DP=Depersonalization, TFL=Transformational Leadership, PA=Personal Accomplishment, IVC = Controlled for Independent Variable)

Mediation Model

The interaction effect in the moderation analysis of Model 1, which included

emotional exhaustion, teaching autonomy, and teacher orientation (moderator) was not

significant. Because of the pattern of correlations between the variables a mediation

analysis was indicated and performed to better describe the relationship between the

variables in the model. The four conditions necessary for statistical mediation were met.

The predictor variables and the outcome variable were all highly correlated. A multiple

regression analysis was performed in which teacher orientation was the predictor,

teaching autonomy was the mediator, and emotional exhaustion burnout was the

outcome, After controlling for the relationship between the mediator and the dependent

variable, the relationship between the predictor and the outcome variable (Path *c*) was reduced substantially (partial mediation); and in the multiple regression analysis, the relationship between the mediator and the outcome variables remains statistically significant (Path *b*).

In this simple three variable model the relationship between teacher orientation and teaching autonomy (Path *a)* is the simple unstandardized regression coefficient, *b*. The relationship between the mediator, teaching autonomy, and the outcome variable, emotional exhaustion, (Path *b)*, is the unstandardized regression coefficient obtained from a multiple regression model in which emotional exhaustion is regressed on teacher orientation. Path *b* represents the relationship between the moderator, teaching autonomy, and the outcome variable, emotional exhaustion after controlling for teacher orientation. Path *c*, also obtained from this multiple regression model, represents the relationship between teacher orientation and emotional exhaustion after controlling for teaching autonomy. Path *c* is referred to as the direct effect of the predictor on the outcome variable.

The simple bivariate correlation coefficients indicate that the relationship between teacher orientation and teaching autonomy was statistically significant, negative, and represented a large effect size, accounting for approximately 77% of the variability in teaching autonomy. When teaching autonomy is regressed on teacher orientation the resulting unstandardized regression coefficient is statistically significant. This coefficient is Path *a* in the mediational model and represents the impact of teacher orientation on teaching autonomy.

Teacher orientation was significantly and positively correlated with emotional exhaustion, accounting for approximately 47% of the variability in emotional exhaustion and represents a large effect size. Teaching autonomy is significantly and negatively correlated with emotional exhaustion, accounting for approximately 75% of the variability in emotional exhaustion and represents a large effect size.

The mediational model was tested using an SPSS (version 27) regression analysis procedure and an internet version of Sobel's test to assess the indirect effect of teacher orientation on emotional exhaustion via teaching autonomy. In the multiple regression analysis, the variable emotional exhaustion was the outcome, or dependent variable, teacher orientation was the predictor, or independent variable, and teaching autonomy was the mediator variable. The overall results of the multiple regression analysis indicated that the variables teaching autonomy and teacher orientation were significant predictors of emotional exhaustion, accounting for approximately 77% of the variance in emotional exhaustion and representing a large effect size.

The impact of teacher orientation on teaching autonomy was statistically significant and negative indicating that decreasing levels of teaching autonomy are associated with teacher orientation. Based on the results for the multiple regression analysis, the impact of teaching autonomy on emotional exhaustion (Path *b*) was strong and statistically significant. This finding supports the hypothesis that teaching autonomy had a significant impact on emotional exhaustion. The impact of teacher orientation on emotional exhaustion (Path *c*) accounted for approximately 2% of the variability in EE scores was reduced significantly thus it can be concluded that the effect of teacher

orientation on emotional exhaustion is substantially mediated through teaching autonomy, though the effect size is very small.

The significance of the indirect effect was assessed using Sobel's calculator. The results of Sobel's test indicated that the indirect effect (of teacher orientation on emotional exhaustion via teaching autonomy) was statistically significant. The traditional condition of the mediator accounts for .613 or 61.3% of the variance in model or the indirect effect of traditional teacher orientation on emotional exhaustion via autonomy and the Montessori condition of the mediator accounts for .401 or 40.1% of the model, indirect effect of Montessori teacher orientation on emotional exhaustion via autonomy.

Teaching Autonomy

The findings of the present study are consistent with previous research cited in Chapter 2, that found teaching autonomy to be significantly, weakly-moderately, and negatively associated with the three dimensions of burnout. Teacher autonomy, like supportive leadership is one of the most prevalent factors contributing to burnout-engagement among teachers. Skaalvik and Skaalvik (2014) found that the perception of autonomy was an independent predictor of both engagement-burnout, depending on the level of decision latitude allowed and encouraged within the school environment. Kaufmann, (2005), found that the requirement to implement scripted curriculum is a primary reason for experienced teachers burning out and leaving the profession. For dedicated teachers, little is of greater inner value than identifying what materials and methods work best with students which is what lies at the core of the powerful influence

that diminished autonomy has on burnout and attrition (Kavanaugh & Fisher-Ari, 2017; 2018).

Collie et al., (2018) found a significant positive relationship between perceived autonomy support and adaptability, and a negative relationship between perceived autonomy support and emotional exhaustion, adaptability was negatively related to burnout, perceived autonomy support was positively related to organizational commitment, and emotional exhaustion was negatively related to organizational commitment. Skaalvik and Skaalvik (2009) found that perceived teacher autonomy was negatively correlated with all three dimensions of burnout: emotional exhaustion, depersonalization, and personal accomplishment. Skaalvik and Skaalvik, (2010) found that teacher autonomy was negatively, but weakly related to emotional exhaustion burnout.

Transformational Leadership

The findings of the present study are consistent with those of studies reviewed in Chapter 2 that found transformational leadership style (behaviors) in school leaders to be significantly, moderately, and negatively associated with the three dimensions of burnout. The literature review indicated that among the multiple factors at both the personal and organizational levels that result in teacher stress and burnout, the lack of supportive leadership and autonomy are the most prevalent (Greenberg et al., 2016). More teachers leave the profession because of their perception of non-supportive leadership than for any other reason (Denmark, 2012). Multiple studies have demonstrated that the relationship between the transformational leadership style of elementary school leaders and teacher

stress and burnout is statistically significant (Bass et al., 2016; Cansoy, 2019; Lambersky, 2016; Osunka & Unachukwu, 2020; Oullette. et al. 2018). Sosik and Godshalk (2000) found that transformational leadership behaviors were significantly related to reduced stress and burnout levels and increased job and task satisfaction levels among teachers. A multi professions meta-analysis of 157 studies (that included multiple studies with teachers) found that transformational leadership was significantly negatively associated with both stress and burnout in employees (Harms et al., 2017). Transformational leadership was also found to be moderately negatively associated with each of the three dimensions of burnout (Harms et al., 2017). Similarly, Hetland, Sandal, and Johnsen (2007) found that leaders demonstrating transformational leadership qualities had employees with significantly lower stress and burnout levels, but employees of leaders with laissez-faire or passive-avoidant styles had significantly higher levels of stress and burnout.

Gong, Zimmerli, and Hoffer (2013) found that transformational leadership was significantly negatively related to the emotional exhaustion and depersonalization subscales and significantly positively related to the personal accomplishment construct. These findings suggest that the influence of transformational leadership on burnout may result from both direct affects and the indirect influence of mediators experienced by teachers in their specific school environments (Gong et al., 2013).

Limitations of the Study

The present study was limited to U.S. public elementary teachers who teach either grade 4, 5, or 6, or a combination of these grades, hold state elementary certification or a

Montessori elementary credential plus state certification, and have taught for at least one

year prior to study participation. Therefore, results from the study may have limited

generalizability beyond this population. It is possible that public school elementary

teachers teaching in specialty magnet programs, more experienced teachers, and teachers

with plans to exit the profession may have perceived the questions differently and

responded accordingly. Also, the demographic questions in the study did not determine

the type of Montessori credential (AMI, AMS, or Other) held by the Montessori sample

which could have a considerable influence over their levels of fidelity to the method.

Excluded from this study were Montessori teachers who had not received their

elementary credential but may have been teaching in a Montessori elementary program in

a US public school after acquiring state certification but not Montessori credentials. The

study did not determine the classification of the school in terms of urban, rural, or

suburban, which are factors that may impact teachers' perceptions as they relate to the

study variables. Including data on these topics, and considering, in relation to the results

and making the criteria for inclusion somewhat less stringent may have influenced the

results. Another limitation of this study was not having the option to target and identify

"high fidelity" Montessori teachers. Montessori elementary teachers committed to the

philosophy and pedagogy unique to Montessori who fully implement this in their

classrooms were the intended target population for this study but identifying such

teachers would have required observation in schools considered "high fidelity". The

Teaching Autonomy Scale and the MLQ-Transformational leadership Scale results

indicated that the Montessori sample perceived themselves to have experienced higher

levels of teaching autonomy and transformational leadership style but there may have been other factors involved such as social desirability bias. Larson (2019) suggested participant anonymity and confidentiality, which were provided in this survey, have the potential to decrease the risk for this type of bias. If this type of bias influenced the results of the present survey it may have been for reasons of self-deception which is one of the major causes of this type of bias (Larson, 2019).

Another limitation may have been the potential of response bias that may result from using an internet-based convenience sample. The teachers who elected to participate in this internet-based study may be different from those who did not elect to participate, thus potentially limiting representation of the target population (Stroebe et al., 2018). The eligibility of the teacher participants is also questionable and a threat to validity. In internet-based studies participant honesty regarding the eligibility criteria for participation must be totally relied upon. The screening questions were used to minimize this threat, however, there is no way to determine the level of honesty of the participants. The influence of response bias is undetermined for this study as there is no way to gauge it in internet-based research. Despite the possibility of bias in the present study, the results are consistent with those studies cited in the literature review. This study found small to moderate effect sizes in the regression, moderation, and mediation analyses which align with the effect sizes of the research studies cited.

The COVID-19 pandemic may have been a limitation of this study as a historical threat involving an extraneous event occurring during the study and during the months preceding it that may have affected the participants' responses on the dependent measure

(Cooper, 2020). The COVID-19 pandemic shut down most public and private schools in the US during the latter part of the 2019-2020 academic year and may result in continuing closures in the 2020-21 and 2021-22 school years. This qualifies as a major societal event that may influence teachers and their responses to the study instruments as well as the screening instruments. Being separated from the usual dynamics of the school environment may influence their perceptions and responses in a way that does not reflect their perceptions of experiences under usual conditions. Asking the participants to reflect on their most recent in-school experiences may have some impact on the quality and relevance of their responses. The high validity and reliability of the three instruments selected to measure the dependent and independent variables may also help to minimize this threat.

Lastly, a potential limitation of this study may have been the small sample size. The sample size was 82 and included 40 state certified teachers and 42 Montessori certified teachers. The target sample size was 100 which is generally considered the minimum sample size for multiple regression analyses to ensure sufficient statistical power (Keith, 2019). This study could be redone with a larger sample size and efforts to ensure that the Montessori teacher component of the sample includes "high fidelity" Montessori teachers.

Recommendations

This study addressed gaps in the literature by examining the relationships between burnout and teachers' perceptions of autonomy and supportive leadership in Montessori versus traditional teachers. As this had not yet been measured it has been unknown if

there are significant differences in these relationships between these diverse educational methods. The results of this study indicate the existence of strong relationships between the three dimensions of burnout, teaching autonomy, and supportive leadership style. Further they indicate that both teaching autonomy and supportive leadership are significant predictors of the three dimensions of burnout. They also indicate that teacher orientation, Montessori or traditional, has significant moderating effects on the level of burnout in teachers, and that teaching autonomy is a significant mediator of emotional exhaustion burnout and teacher orientation.

Future research examing the effects of teaching autonomy, supportive leadership style, and the dimension of burnout among teachers should expand the sample size, identify and include only "high fidelity" Montessori teachers (in the Montessori component of the sample) or teachers from other child centered pedagogical traditions, such as Emilio and Waldorf. Including teachers from private schools that operate with greater autonomy than public schools should also be a consideration for future research as this may provide additional insights.

Future research on teacher stress and burnout should focus on the other known factors that contribute to this as well as the mediating effects of autonomy and supportive leadership on these factors and the dimensions of burnout. As discussed in chapter 1, teaching is one of the most demanding and stressful professions, with most teachers experiencing high levels of stress that exceed those of most other professions (Wiggins, 2015; Will, 2017). Teacher attrition rates in the United States are twice (8%) the international average (4%). There is a serious teacher shortage, or an inability to staff

schools with individuals qualified to teach in the required subject areas, that is projected to become more intense (Carver-Thomas & Darling-Hammond, 2017; Sutcher et al., 2016). Teacher stress and burnout is not just a problem in US schools but has been and continues to be researched in countries throughout the world and has been determined to be a major problem for educational systems globally (Collie et al., 2017). Future research into this problem needs to focus, not only on defining, redefining the problem in relation to the contributing factors, but on developing and applying effective interventions based on the research findings.

Implications for Social Change

The primary mechanism by which social change could be enacted in relation to this study is through the contribution that this study will make to the theory and research on teacher burnout. This primarily entails providing an enhanced understanding of two of the most prevalent antecedents of teacher burnout: perceived autonomy and supportive leadership. The examination of these key factors within educational environments that may be associated with lower levels of burnout could potentially inform mitigation policies that will foster engagement in elementary teachers and school environments. The primary significance of this study is the information that it will provide on the relationships among perceived autonomy and supportive leadership and teacher burnout in Montessori versus traditional schools. The empirical research data, such as that resulting from this study, will inform school systems in the development of burnout prevention interventions that will increase engagement among teachers. Many of the factors that result in teacher burnout may be identified, quantified, and mitigated through

programs focused on increasing engagement. The examination of these key factors within educational environments that may be associated with lower levels of burnout will potentially inform mitigation policies that will foster engagement in elementary teachers and school environments.

Theoretical Implications

More important than the findings of this study or any other study that provides empirical data related to burnout in educators, is the obvious grounding of the phenomenon in relevant theory. Almost 50 years of research in burnout beginning with Freudenberger's seminal study in 1974 has provided some major insights into the contributing antecedents of burnout and the underlying supporting theories that are consistent across multiple professions (Freudenberger, 1974). Self-determination theory, Maslach's multi-dimensional burnout theory (MMBT), and transformational leadership theory clearly define the importance of autonomy and social support/relatedness in professional environments as buffers against burnout. Self-determination theory proposes three universal fundamental psychological needs, autonomy, relatedness, and competence, which are essential for healthy personality development, integration, and wellbeing (Deci & Vansteenkiste, 2004). According to self-determination theory, if the three innate needs of competence, relatedness, and autonomy are satisfied, individuals will experience optimal function and growth (Deci & Vansteenkiste, 2004).

According to multiple research studies conducted on the topic of fundamental psychological needs and burnout, when any of these needs are frustrated burnout is a likely result. Self-determination theory posits that satisfaction of the basic need for

autonomy promotes intrinsic motivation; the perception of autonomy aids in the

maintenance of intrinsic motivation (Gagne & Deci, 2005). According to the basic tenets

of SDT, it should be expected that perceived autonomy in teachers would be a significant

predictor of engagement and job satisfaction. Skaalvik and Skaalvik (2009; 2014) found

that autonomy and supportive leadership resulted in higher levels of teacher intrinsic

motivation and were significant positive predictors of teacher engagement.

Though some degree of autonomy is required by teaching professionals to

effectively deal with unexpected situations, in the case of Montessori teachers, autonomy

is required to respond to developmental cues with spontaneous curriculum development

within the defined pedagogical framework (AMS, 2018). Well-being and growth occur if

the environmental needs of the individual are provided, if they are not met negative

outcomes are likely to result (Deci & Vansteenkiste, 2004). As teachers' psychological

needs attainment are compromised by excessive job demands or by deficient resources,

they become more vulnerable to developing burnout (Fernet et al., 2013).

The fundamental psychological need of relatedness is defined by SDT as the need

to care for and to be cared for by others as well as to share a sense of belongingness to

others in the community (Deci & Vansteenkiste, 2004). Much emphasis is being placed

on supporting the psychological needs of students in the schools, primarily through

teacher endeavors to establish needs-supportive classrooms, however, there is the

prerequisite of first satisfying the psychological needs of the teacher (Marshik et al.,

2017; Ryan et al., 2017). It is now recognized from the results of several SDT studies

involving teachers and their students, that teachers psychological needs affect their

capacity to address the needs of their students as well as their personal wellbeing and growth as individuals (Marshik, et al.; Pelletier & Sharp, 2009; Roth et al., 2007). School leadership is a critical factor in establishing the atmosphere of the school and plays the most influential role in determining the degree to which the psychological needs of teachers are met within the schools (Berkovich & Eyal, 2017).

In a study on factors influencing early career teachers, Hobson and Maxwell (2017) found that relatedness was the most prevalent factor influencing the wellbeing of early career teachers. Relatedness was displayed through positive relationships with students, colleagues, mentors, and principals as well as through the development of friendships (Hobson & Maxwell, 2017). In a longitudinal study involving 10,395 third grade students and their teachers, it was found that students were significantly more motivated and achieve at a higher level if their basic psychological needs were adequately addressed (Marshik et al., 2017). However, they found that teachers whose psychological needs were not being met exerted a negative influence on the needs satisfaction and achievement of their students. This study also found that teachers who experienced a sense of autonomy in teaching had students who achieved significantly higher standardized reading assessment scores across the reading subskill areas (Marshik et al., 2017).

Non supportive school leadership is one of the factors contributing to teacher dissatisfaction, stress, and burnout (American Federation of Teachers, 2017). Low quality leadership, which does not meet the needs of the faculty and school community is a prevalent complaint among teachers (Balyer, 2012). A successful school environment

requires leadership that provides inspiration and empowerment to the teachers and the school community.

Maslach's multidimensional theory of burnout (MMBT) and its extensions the Leiter theory, and the Work-Life theory provides the most comprehensive framework for conceptualizing burnout and addressing the need for solutions in the workplace (Maslach, 1998). Work life theory is an integral extension of Maslach's multidimensional burnout theory and provides greater clarity on the development of burnout in response to environmental factors. Numerous personal and environmental factors play into the development of job burnout which Maslach and Leiter (1997, 2016) attempted to respond to by developing a model that targeted the degree of match, or mismatch, between the individual and six major areas of work life that envelop the central relationships with burnout: workload, control, reward, community, fairness, and values. The mismatches result in burnout, which manifest in various outcomes whereas matches result in engagement. This model has helped to generate order among a wide variety of environmental-situational correlates that result in burnout (Maslach et al., 2001; McFadden et al., 2018). Teachers may potentially experience mismatches in all six of these work life areas, mismatches in the areas of control and a sense of community most closely relate to the independent variables, autonomy and supportive leadership, which were the focus of this study.

Leiter's theory defined a developmental pathway for burnout (Leiter, 1989). The development of the burnout phenomenon has been theorized to occur in distinctively different sequences, but the Leiter model which places emotional exhaustion in a central

position, associating it with the depersonalization and personal efficacy, seems to be the most appropriate for education professionals because of the excessive number of emotionally exhaustive factors they confront, and their association with the other constructs (Leiter, 1989). Exhaustion results primarily from mismatches in workload and job control because of the excessive demands both place on the teacher because of the anxiety they induce (Maslach & Leiter, 2008). A manageable workload results in sustainable energy levels while reducing the risk of burnout. Work overload is a major contributor to exhaustion and often results in burnout as it serves as the primary stress component (Karasek & Thorell, 1990). The source of work overload is commonly associated with insufficient job control, which limits the perception of autonomy and the discretion necessary to make regulatory decisions regarding workload (Portoghese et al., 2014). The prevalence of job control (autonomy) is a major contributing factor in determining the development of burnout or engagement in the work environment. Sufficient autonomy enables professionals to shape their work environments creating a balanced manageable workload (Maslach & Leiter, 2003).

Despite the complexity of the development and mitigation of teacher burnout, leadership quality stands out as one of the most prevalent contributing factors, if not the most prevalent, and clearly must be remedied for the problem to be adequately addressed (Denmark, 2012; Player et al., 2017; Smith, 2016; Thibodeaux et al., 2015).

Transformational leadership is an approach to leadership that emphasizes creating beneficial changes in followers through inspiration (Bass, 1990). James Burns introduced the concepts of transformational leadership after studying political leadership,

it was later applied to organizations (Bass, 1990). Bass (1990) added to the work of Burns by explaining the psychological mechanisms that underlie transformational and transactional leadership. Bass' theory established the four factors demonstrated by transformational leaders: individual consideration, intellectual stimulation, inspirational motivation (charismatic leadership), and idealized influence. Transformational leadership is a tested and effective method for improving school outcomes (Windlinger et al., 2020). Leaders who implement one or more of the four dimensions of transformational leadership (idealized influence, inspirational motivation, intellectual stimulation, or individualized consideration), into their supervisory methods, experience significant results related to the prevention and mitigation of burnout (Hildenbrand et al., 2018).

The critical role of school leaders in affecting teacher wellbeing, professional efficacy, and improving student outcomes is well known because of the multiple studies that have been performed (Abos et al., 2018; Berkovich & Eyal, 2017; Ford et al., 2019; Thomas et al., 2020). Leadership which does not address the needs of the faculty, staff and school community is the primary complaint among former and current teachers (Balyer, 2012).

Transformational leadership is a form of leadership that seeks to inspire and empower faculty and staff to achieve success, by setting a vision, and instilling trust, confidence, and pride in the school, while providing intellectual stimulation which are required elements for a successful school environment (Smith, 2016). The research on transformational leadership suggests that it is a powerful and effective model when implemented in school environments with the potential to increase retention in its

capacity to address and remedy many of the leadership-centered factors that contribute

most significantly to teacher burnout and attrition (Player et al., 2017; Smith, 2016;

Thibodeaux et al., 2015).

The effects of transformational leadership behavior on school conditions which

support teaching and learning have demonstrated the beneficial effects of this model in

the schools (Hallinger et al., 2018; Leithwood & Sun, 2012; Sun & Leithwood, 2017). In

another study, Leithwood and Sun (2012) evaluated numerous effective models of school

leadership including transformational leadership. They discovered that many of the more

effective leadership models contained the same general elements that resulted in positive

school outcomes (Leithwood and Sun, 2012). Thus, they advocated that school leaders

consider implementing specific evidence-based practices to support their staffs rather

than total models (Leithwood and Sun, 2012). In another study, Sun and Leithwood

(2012) performed a metanalysis across several reviews on the effects of transformational

school leadership on student achievement. They found that transformational leadership

had significant positive effects on five different types of student outcomes—achievement,

attendance, college-going rates, dropout rates, and graduation rates (Sun & Leithwood,

2012). Training school leaders in leadership practices that provide them with the

knowledge and skills that will enable them to establish conditions in the schools that

support teachers and improve student achievement is the indicated approach (Ford &

Ware, 2018).

Teacher burnout is grounded in these theories. Self-determination theory

addresses the fundamental human need for both autonomy and leadership support, the

MMBT clearly relates the work life areas to the three dimensions of burnout specific in teachers, and Leiter expands on this with a focus on the essential nature of autonomy and the vulnerability of teachers to burnout from deficient levels of autonomy, and transformational leadership theory fully explains how essential social support, specifically supervisor support is to teachers. The literature provides sufficient evidence to define the antecedents of burnout, the primary factors of autonomy and supportive leadership and their grounding in prevalent theories of frustration of basic psychological needs.

The sample of teacher-participants from this study clearly represented that autonomy and relatedness are fundamental psychological needs that when frustrated can result in burnout in any or all three dimensions (either directly or indirectly). Montessori teachers, by pedagogic necessity, are extended greater autonomy and leadership support of this autonomy, which was the focus of this study, to evaluate Montessori as a model of the impact of these two variables on burnout levels across the three dimensions. In each of the regression, moderation, and mediation models developed and tested in support of the hypotheses of this study the results indicated that higher levels of both perceived teaching autonomy and supportive leadership resulted in lower levels of burnout across the three dimensions.

The MMBT relates deficiencies in autonomy to all three dimensions of burnout but specifically because of the lack of control and the ensuing work overload often initially results in emotional exhaustion. When the perception of belonging to a community is lacking in the work environment, emotional exhaustion, and

depersonalization develop. Teachers who lack the support of community, specifically of supervisors, are less resilient to the rigors of the profession and are more subject to stress and burnout. The teacher sample from this study demonstrated that supervisor support, contributed more to the variance in the model than teaching autonomy though both made significant contributions to levels of stress and burnout. The results of this study are closely aligned with the research on transformational leadership, which suggests that it is a powerful and effective model with the potential to mitigate many of the leadership-centered factors that contribute most significantly to teacher stress and burnout.

Conclusion

There are multiple indicators that the US public education system is in crisis with many teachers experiencing chronic stress and burn out. Teaching is one of the most demanding and stressful professions, with most teachers experiencing high levels of stress that exceed those of most other professions. Over 63% of K-12 educators consider themselves to be stressed most of the time with stress levels as high as 93% indicated in elementary teachers. Close to 70% of full-time K-12 teachers in the U.S. are not engaged, teacher attrition rates in the United States are twice the international average, and finally there is a serious teacher shortage that is projected to become more intense in the future.

Despite the identification of the problem as largely the outcome of the violation of the basic psychological needs of teachers, both Montessori and traditional public-school teachers continue to experience decreasing levels of autonomy as the teaching profession becomes more influenced by the utilitarian

values of federal, state, and local education agencies, imposing additional standards and the testing used to enforce the standards. School administrators are more prone to support standardized curriculum rather than autonomous curriculum at the level of the teacher-child, resulting in greater frustration and disillusionment on the part of teachers as their personal and professional values and commitments to quality education are compromised.

The findings of this study indicate that teaching autonomy and supportive leadership are primary factors influencing burnout-engagement in teachers. If they are extended to teachers to a degree that allows the teacher to perceive those fundamental psychological needs are being met, higher levels of engagement are likely to result. If the teachers' basic needs are not met, burnout is likely to continue to develop. Much remains to be learned about the relationships among the dimensions of burnout and the many factors that contribute to them, but regardless of the volume of empirical evidence provided through research, informed efforts at intervention must be made. Fundamental changes must be made in the worldview of our education system from the integration of proven theoretical foundations that align with and support the findings of burnout research. The Montessori philosophy of education as well as other holistic educational models provide options for mitigation through increasing teaching autonomy and providing supportive leadership to teachers.

This study demonstrates that the Montessori method is a potential model for change as it integrates a holistic multifaceted view of human development, and respect and support for the professional capacity of the teacher, rendering it more closely aligned

with theories that adequately address the fundamental psychological needs of both teachers and students. The key to teacher-student engagement may be found in the autonomy-supportive teaching approach of Montessori which involves an interpersonal tone of support and understanding from the teacher, increases students' positive classroom functioning, and results in greater engagement. It does this because it nurtures and supports the basic psychological needs for autonomy, competence, and relatedness. The primary reason students show robust classroom engagement is because they first experience engagement-energizing psychological need satisfaction as a result of teacher implementation of an autonomy-supportive instructional approach. Extending autonomy and leadership support of this autonomy to teachers is not an option but a basic need with the potential to effectively address and mitigate the current educational crisis.

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Appendix A: Montessori Participation Requirements

1.) You are an AMI or AMS trained/certified Montessori 6-9 and/or 9-12 elementary teacher.
2.) You are or have recently been employed in a US Montessori public or public charter school for at least 1 academic year.
3.) Your class is/was multi age/grade (4-6).
4.) You use the classic Montessori pedagogy/lessons as your primary curriculum only using traditional materials, lessons, books supplementally, or by integrating them into the Montessori curriculum.
5.) You integrate the Cosmic Curriculum/Great Lessons across your curriculum.
6.) You teach at the level of the child.
7.) You encourage/require respect from children/ between children/ to children.
8.) You display sensitivity to multiple intelligences when guiding small and large group lessons, follow-ups and projects.
9.) You require that children balance freedom of choice with responsibility.
10.)	You require children to follow work contracts and monitor goal completion.
11.)	You require children to follow classroom rules/guidelines.
12.)	You consider yourself to be a high fidelity/genuine/committed Montessorian.

Appendix B: Traditional Teacher Participation Requirements

1.) You teach either Grades 4, 5, or 6.

2.) You teach in a public or public charter elementary school.

3.) You are fully certified in the state where you teach.

4.) You have taught for at least 1 academic year.

Appendix C: Demographic Information Form

Please, complete the following form.

1.) Age_____
2.) Grade level(s) you teach_____
3.) Gender   ____Female   ____Male   ____Other
4.) Class Size_____
5.) Years of elementary teaching experience____
6.) Level of education completed: ____Bachelor's Degree   ____Master's Degree
____Doctoral Degree   ____Other
7.) Teacher Certification Type:
          ____Montessori AMS 6-9, 9-12 or 6-12
          ____Montessori AMI 6-9, 9-12 or 6-12
          ____State Elementary Teacher Certification
8.) School Classification
          ____Title I (High numbers of low-income students)
          ____Title II (Funded to improve teacher & principal qualifications)
          ____Title III (funded to assist with English language instruction)
          ____None of the above

Appendix D: Maslach Burnout Inventory Educators Survey™

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To Whom It May Concern,

The above-named person has made a license purchase from Mind Garden, Inc. and has permission to administer the following copyrighted instrument up to that quantity purchased:

Maslach Burnout Inventory forms: Human Services Survey, Human Services Survey for Medical Personnel, Educators Survey, General Survey, or General Survey for Students.

The three sample items only from this instrument as specified below may be included in your thesis or dissertation. Any other use must receive prior written permission from Mind Garden. The entire instrument form may not be included or reproduced at any time in any other published material. Please understand that disclosing more than we have authorized will compromise the integrity and value of the test.

Citation of the instrument must include the applicable copyright statement listed below. Sample Items:

MBI - Human Services Survey - MBI-HSS:
I feel emotionally drained from my work.
I have accomplished many worthwhile things in this job.
I don't really care what happens to some recipients.

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MBI - Human Services Survey for Medical Personnel - MBI-HSS (MP):
I feel emotionally drained from my work.
I have accomplished many worthwhile things in this job.
I don't really care what happens to some patients.

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MBI - Educators Survey - MBI-ES:
I feel emotionally drained from my work.
I have accomplished many worthwhile things in this job.
I don't really care what happens to some students.

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MBI - General Survey - MBI-GS:
 I feel emotionally drained from my work.
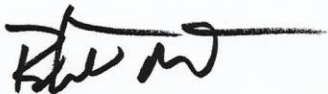 In my opinion, I am good at my job.
 I doubt the significance of my work.

MBI - General Survey for Students - MBI-GS (S):
 I feel emotionally drained by my studies.
 In my opinion, I am a good student.
 I doubt the significance of my studies.

Sincerely,

Robert Most
Mind Garden, Inc.
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Appendix E: Multifactor Leadership Questionnaire

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To Whom It May Concern,

The above-named person has made a license purchase from Mind Garden, Inc. and has permission to administer the following copyrighted instrument up to that quantity purchased:

Multifactor Leadership Questionnaire

The three sample items only from this instrument as specified below may be included in your thesis or dissertation. Any other use must receive prior written permission from Mind Garden. The entire instrument may not be included or reproduced at any time in any other published material. Please understand that disclosing more than we have authorized will compromise the integrity and value of the test.

Citation of the instrument must include the applicable copyright statement listed below. Sample Items:

As a leader ….
     I talk optimistically about the future.
     I spend time teaching and coaching.
     I avoid making decisions.

The person I am rating….
     Talks optimistically about the future.
     Spends time teaching and coaching.
     Avoids making decisions

Sincerely,

Robert Most
Mind Garden, Inc.
www.mindgarden.com

Appendix F: Teaching Autonomy Scale

1. I am free to be creative in my teaching approach. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

2. The selection of student-learning activities in my class is under my control. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

3. Standards of behavior in my classroom are set primarily by myself. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

4. My job does not allow for much discretion on my part. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

5. In my teaching, I use my own guidelines and procedures. C

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

6. I have little say over the content and skills that are selected for teaching. C

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

7. The scheduling of use of time in my classroom is under my control. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

8. My teaching focuses on those goals and objectives I select myself. C

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

9. I seldom use alternative procedures in my teaching. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

10. I follow my own guidelines on instruction. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

11. I have only limited latitude in how major problems are resolved. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

12. What I teach in my class is determined for the most part by myself. C

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

13. I have little control over how classroom space is used. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

14. The materials I use in my class are chosen for the most part by myself. C

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

15. The evaluation and assessment activities are selected by others. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

16. I select the teaching methods and strategies I use with my students. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

17. I have little say over the scheduling of use of time in my classroom. G

Definitely True	More or Less True	Neither True nor False	More or Less False	Definitely False

18. The content and skills taught in my class are those I select. C

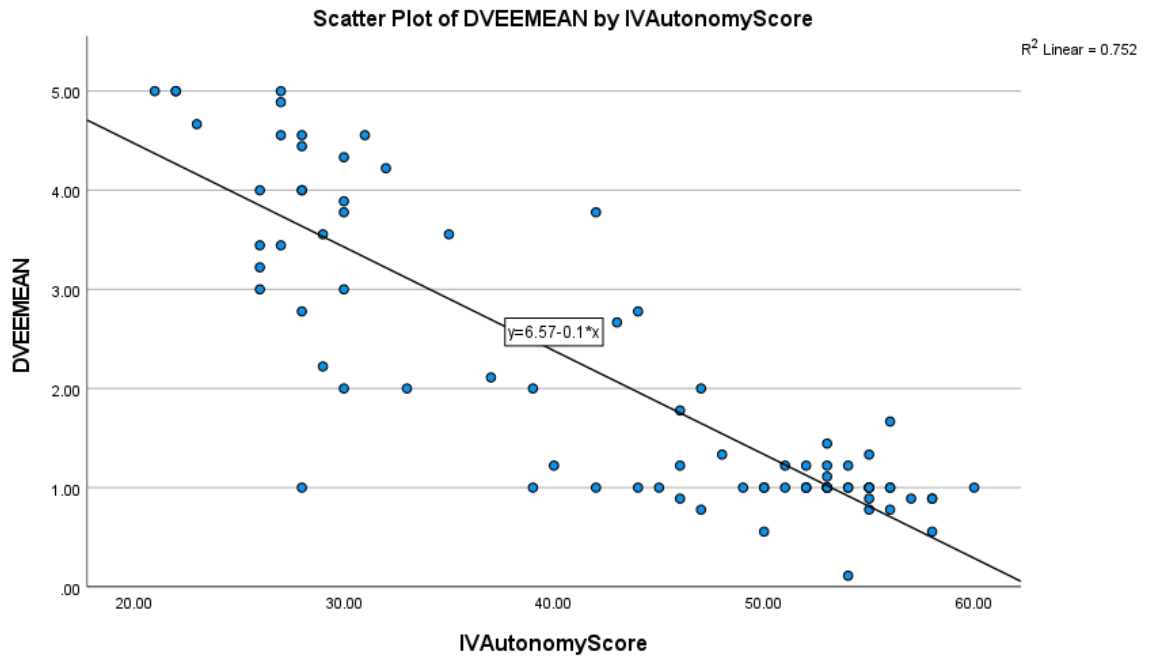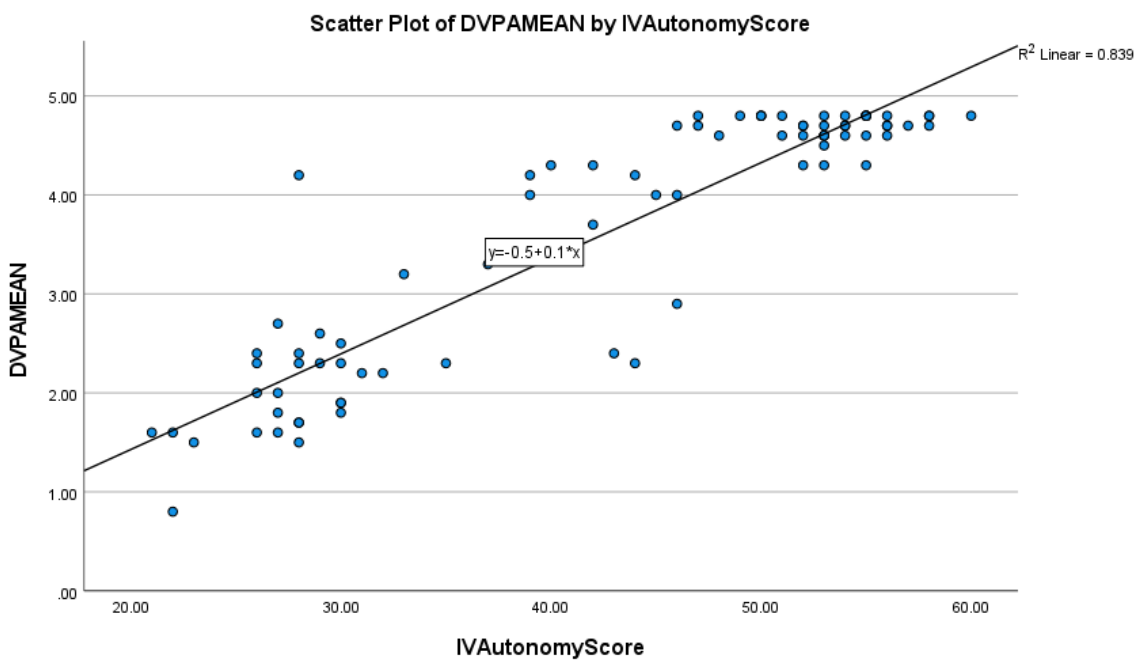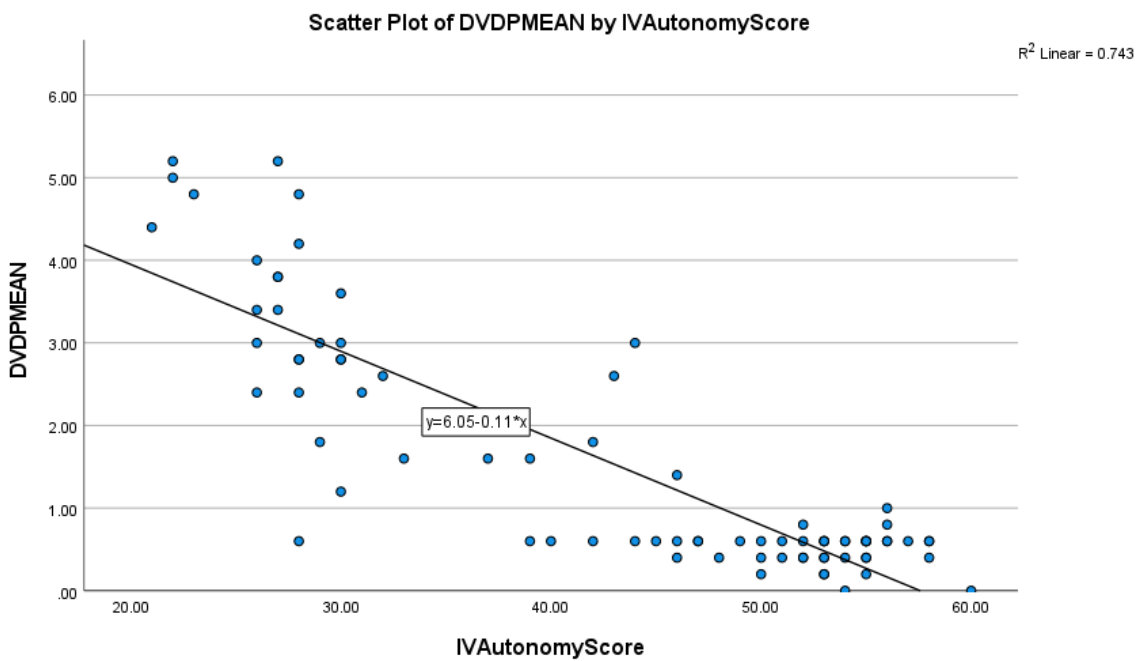| Definitely True | More or Less True | Neither True nor False | More or Less False | Definitely False |

Appendix G: Scatter Plots Moderation Regressions

Scatter Plot of DVEEMEAN by IVAutonomyScore

R^2 Linear = 0.752

$y = 6.57 - 0.1 \cdot x$

Scatter Plot of DVDPMEAN by IVAutonomyScore

R^2 Linear = 0.743

y=6.05-0.11*x

Scatter Plot of DVPAMEAN by IVAutonomyScore

R^2 Linear = 0.839

y=-0.5+0.1*x

Scatter Plot of DVEEMEAN by IVTFLMeanScores

R^2 Linear = 0.790

y=5.22-1.44*x

DVEEMEAN

IVTFLMeanScores

Scatter Plot of DVDPMEAN by IVTFLMeanScores

R^2 Linear = 0.762

y=4.66-1.43*x

DVDPMEAN

IVTFLMeanScores

Scatter Plot of DVPAMEAN by IVTFLMeanScores

R^2 Linear = 0.842

$y=0.81+1.3*x$

Appendix H: Regression Output

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: DVEEMEAN

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: DVDPMEAN

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: DVPAMEAN

Scatterplot
Dependent Variable: DVEEMEAN

Scatterplot
Dependent Variable: DVDPMEAN