TEACHER AUTONOMY IN THE UNITED STATES: ESTABLISHISHING A STANDARD DEFININTION, VALIDATION OF A NATIONALLY REPRESENTATIVE CONSTRUCT AND AN INVESTIGATION OF POLICY AFFECTED TEACHER GROUPS

A Dissertation

presented to

the Faculty of the Graduate School

at the University of Missouri-Columbia

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

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by

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Dr. Bradley Curs, Dissertation Supervisor

DECEMBER 2012

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The undersigned, appointed by the dean of the Graduate School, have examined the dissertation entitled

TEACHER AUTONOMY IN THE UNITED STATES: ESTABLISHISHING A STANDARD DEFININTION, VALIDATION OF A NATIONALLY REPRESENTATIVE CONSTRUCT AND AN INVESTIGATION OF POLICY AFFECTED TEACHER GROUPS

presented by Kevin Dale Gwaltney,

a candidate for the degree of doctor of philosophy,

and hereby certify that, in their opinion, it is worthy of acceptance.

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My late parents, Dale W. and Ethel M. Gwaltney, whole-heartedly believed that education is the key for individual success and that individual success is vital to the nation's health, so I grew up believing that learning is a life-long journey. Had my parents not instilled great respect and regard for education, it is fair to say that this product -- any many others -- may not have come to be. For those reasons, I am pleased to dedicate this work to their memories.

I have also been blessed to have had the full support of my family. On countless occasions, the work has claimed time we would have spent together. However, because my family believed the project had something important to contribute, they put up with the inconveniences. Tami and Megan, I want you to know that without your help, support and understanding; it would not have been possible nor will it have been worth it. So, with love, I dedicate this work, and any good that may come from it, to you both.

ACKNOWLEDGEMENTS

I wish to acknowledge the phenomenal faculty and staff of the Educational Leadership and Policy Analysis department at the University of Missouri. I have gained greatly from the professional expertise of each and every member. There are however individuals who have gone above and beyond in helping me to attain my goals.

I wish to thank Dr. M. Carol Maher who has been a wonderful friend for many years. Carol not only encouraged me to pursue a Ph.D. at Mizzou, she set up my initial ELPA visits and interviews. Later, Dr. Maher helped me secure a research assistantship that vastly augmented the value of the experience. Without Carol's encouragement and support this life-changing chapter may not have happened.

Among my most valued experiences was observing the administrative skill and sheer scholarship expertise of Dr. Joe Donaldson. While working for Dr. Donaldson, he generously asked me to join in his research projects and included me in important administrative decisions and functions. Joe has contributed expertise to my dissertation research and valuable advice that will always inform my approach to scholarship and career. Dr. Donaldson is a consummate professional and more importantly, a great human being. I am very proud to call Joe my friend.

This project employs a restricted data set that is in no way easy to access. By establishing a secure data room, an endeavor that required significant time and effort, Dr. Motoko Akiba made it possible for me to use the National Center for Education Statistics Schools and Staffing Survey; the largest and most comprehensive data source available on U.S. schools. Motoko's contribution was indispensible in making the work relevant. Dr. Akiba, thank you very much.

Some of my most memorable and important coursework was completed in MU's Truman School of Public Policy. An experience that stands out was the leadership course

I took with Dr. Barton Wechsler. As Dean of the Truman School, Dr. Wechsler is a very busy man. Nonetheless, he graciously agreed to serve on my dissertation committee and I wish to thank him kindly for his scholarship, fellowship, and his time and attention.

No one has shaped and supported this effort more than Dr. Bradley Curs. Dr. Curs mapped out a strategy to maximize the probability that the project would become salient in the research community. He suggested that the dissertation take the form of three articles intended for journal publication and that the articles be presented at consequential conferences. To realize those goals, Dr. Curs has spent countless hours evaluating numerous manuscripts and proposals. To date that strategy has been effective in earning me recognition as a David L. Clark Scholar, as well as invitations to present at several prestigious national conferences. I will always be grateful for Brad's generosity, guidance, insights, and tenacity. Thank you.

In sum, the time I spent in ELPA has been some of the most memorable and enjoyable of my life. It has been a great privilege to learn from and work with such remarkable people. I am proud to know you all as colleagues and friends. Thank you again one and all.

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ABSTRACT

This effort: 1) establishes an autonomy definition uniquely tailored for teaching, 2) validates a nationally generalizable teacher autonomy construct, 3) demonstrates that the model describes and explains the autonomy levels of particular teacher groups, and 4) verifies the construct can represent teacher autonomy in other empirical models.

The definition was used to construct the Schools and Staffing Survey Scale for Teacher Autonomy (SASS-STA). After construct validation, the SASS-STA was then used to explore autonomy differences between groups of teachers who are differently affected by particular policies and to examine how autonomy may impact teaching's motivating potential.

Findings suggest leaders can more effectively increase autonomy levels by creating opportunities for teachers to participate in policy making. Teachers of NCLB assessed subject matters and public school teachers perceived lower levels of autonomy than teachers of non-NCLB assessed disciplines and teachers who worked in charter, and private schools. Also, anecdotal evidence suggested that autonomy may have become more important to teaching's motivating potential among public school teachers since NCLB's implementation.

Chapter I: Introduction

In the United States nearly fifty percent of new teachers leave the profession within the first five years (Chase, 2000; Ingersoll, 2001; Ingersoll, 2002a, Nobscot, 2004). In fact, millions of new teachers will need to be hired by 2013 to replace those who have left over the past decade due to high rates of attrition (on average, six percent higher than similar vocations), retirement and increasing enrollment (Carroll & Fulton, 2004, Ingersoll, 2002b). Therefore, it is imperative that research focus on aspects of teacher job satisfaction and according to the literature, teacher autonomy is an element that deserves more serious attention. Unfortunately however, there has been surprising little focus on teacher autonomy which may be due in part to a lack of basic tools.

Teacher autonomy has had no recognized standard meaning or measurement instrument so previous research efforts have employed a number of definitions and measurement devices. Predictably, that situation has created an apples and oranges scenario which calls into question the consistency of findings and erodes confidence in comparisons. In fact, the inconsistency of teacher autonomy definitions and measurement devices provides reasons to question whether researchers are actually capturing autonomy, parts of autonomy, or something else altogether.

To address that need for standardization, a teacher autonomy definition will be developed by: (a) utilizing an often used industry/business autonomy definition as the chassis to build upon, (b) analyzing and incorporating key words from definitions used in past inquiries, (c) integrating ideas from human motivation, job satisfaction, and public

policy theory, and (d) accounting for the consequential school activities and processes performed by teachers.

To create and validate a measurement model that can accurately capture the fullness of teacher autonomy, the definition will be used as an important template for the selection of items from the most extensive and comprehensive data source available on the staffing, occupational, and organizational aspects of U.S. schools -- the U.S. Department of Education's National Center for Education Statistics Schools and Staffing Survey (SASS). As a second test of validity, the items selected using the definition will then be compared to exemplary items and indicators used in previous teacher autonomy constructs. Structural equation modeling techniques will then be employed to establish, test, and validate a measurement model.

To test the model's utility, it will be used to explore autonomy differences between groups of teachers who are theorized to differ in autonomy due to the effects of various policies. Finally, because autonomy figures prominently in job satisfaction theory, the measurement model will be integrated into a larger measurement construct so that its value in representing teacher autonomy can be demonstrated.

Goals of the Study

In sum then, this effort aims to accomplish three basic goals. Chapter 2 establishes a research standard by developing an autonomy definition that is uniquely tailored for teaching. In chapter 3 the standard definition, previous teacher autonomy constructs, and SASS data sets, are used to establish a nationally generalizable teacher autonomy measurement model. Finally, the goal of chapter 4 is to demonstrate that the new measurement model can successfully describe the autonomy level of particular

teacher groups, show that it is sufficiently sensitivity as to highlight and explain results, and prove that the model can successfully represent teacher autonomy in larger empirical constructs.

Because autonomy is associated with job satisfaction, logic suggests that it may also be a key element of teacher attrition as well, but unfortunately, previous studies have been limited by disparate definitions, measurement models, and small sample sizes. A generalizable teacher autonomy construct will provide a powerful tool to explore interactions among salient leadership, organizational, and occupational variables and constructs. The findings promise to lend important insights for policy makers and school leaders who wish to improve their organizations and the professional lives of the teachers.

Chapter 2: Autonomy: Developing a Programmatic Definition for Teaching

Researchers believe the accountability provisions of policies like No Child Left Behind may affect the amount of autonomy teachers enjoy in the workplace (Crisafulli, 2006; Ingersoll, 1996, 2007; Quiocho & Stall, 2008) a disquieting supposition given that autonomy is a ubiquitous and significant element in prominent job satisfaction models (Barnabe & Burns, 1994; Cohrs, Abele & Dette, 2006; Fried & Ferris, 1987; Hackman & Oldham, 1975, 1976; Karasek & Theorell, 1990; Kreis & Young Brockopp, 2001; Loher, Noe, Moeller & Fitzgerald, 1985; Warr, 1999). Therefore, teacher autonomy is certainly a construct worthy of investigation. Unfortunately, teacher autonomy research has been handicapped by a significant and stubborn challenge, the lack of an agreed upon definition. That situation presents consistency problems in interpreting and comparing the results of the existing research findings. Furthermore, future efforts will be similarly marked if studies continue to employ disparate teacher autonomy definitions. Thus, this exercise presents an incremental approach in establishing a comprehensive and uniquely meaningful standard definition of teacher autonomy informed by a cross-disciplinary examination of the literature.

Before the sweeping effects of various iterations of the Elementary and Secondary Education Act, schools in the United States could often be characterized as organized anarchies or loosely coupled systems (Cohen, March, & Olson, 1972; Weick, 1976). Indeed, until relatively recently, most researchers agreed that schools as organizations were fairly decentralized and that the teachers within them were afforded a great deal of autonomy (Firestone, 1996). However, after the publication of a *Nation at Risk*, as well as

a series of reports exposing the lack luster international ranking of American students, many came to believe that the decentralized nature of U.S. schools were to blame for disorder, inefficiency, and ineffectiveness (Ingersoll, 1996, 2007). As a result, the public's desire for centralized top-down control structures have grown because it is believed that more control can create greater overall accountability which will result in improved outcomes (Wirt & Kirst, 2005). However, tightening control over teachers will almost certainly affect their autonomy, and affecting teacher autonomy may have unintended and unwelcome consequences.

Over the last decade or so, research has consistently implied that teaching in the United States is immediately and significantly dissatisfying. The disturbing reality is that the annual turnover rate for teachers is six-percent higher than for workers in similar social-service vocations, and more alarmingly, 46 percent of new teachers (fifty in urban districts) leave the profession within the first five years (Chase, 2000; Ingersoll, 2001; Ingersoll, 2002a, Nobscot, 2004). Those kinds of attrition statistics, combined with retirement and increasing enrollments, suggest that millions of new teachers will soon need to be hired to meet the nations needs (Carroll & Fulton, 2004, Ingersoll, 2002b). Hence, it is imperative that the job satisfaction, and important constructs related to the job satisfaction of teachers, like autonomy, receive intensified attention.

Karasek and Theorell's Job Demands-Control-Support Model theorizes that low levels of job demands (workload, stress) in concert with high levels of job control (autonomy) and participatory social support from colleagues or supervisors are relevant dispositional and situational predictors of job satisfaction (Karasek & Theorell, 1990). Warr (1999) suggested an even larger array of indicators including opportunity for

personal control (autonomy, self-determination), opportunity for skill use, externally generated goals, task variety, environmental clarity, availability of money, physical security, supportive supervision, opportunity for interpersonal contact, and valued social position. Hackman and Oldham's, (1975, 1976) Job Characteristics Model posits that job satisfaction depends on task identity, task significance, skill variety, autonomy, and feedback as well as the individual's need for growth.

Clearly, job satisfaction models differ in terms of predictors, but the inclusion of autonomy is one area of agreement. Not only is autonomy present in a number of important job satisfaction models; a sizeable number of research efforts that have examined workers in numerous types of industries (e.g., business, education, law enforcement, medicine) have found that higher levels of autonomy correlate with higher levels of job satisfaction and moreover, that autonomy is often the most significant predictor (Barnabe & Burns, 1994; Cohrs et al., 2006; Fried & Ferris, 1987; Kreis & Young Brockopp, 2001; Loher et al., 1985; Pearson & Moomaw, 2005, 2006).

Teacher Autonomy: Formulating a Standard Definition for a Complex Latent Construct

When researchers have studied autonomy, they have employed definitions utilized in prior inquiries, posited definitions for the specific research effort, or have used the word interchangeably with a host of other words and phrases -- not a dictionary definition of autonomy. As a result, the formal meaning of autonomy is often diluted or ignored altogether which has made autonomy's meaning a virtual chameleon which shifts shape and color depending on the inquiry and on occasion, within the same inquiry. As we will see, the sheer number of autonomy interpretations speaks to complexity of the concept as

well as to consistency concerns. Thus, a standard teacher autonomy definition should fully and accurately describe the color and context of the K-12 public education workplace to promote consistency of research findings.

Israel Scheffler (1960) posited three definition types: stipulative, descriptive, and programmatic in his book, *The Language of Education*. Stipulative definitions are *invented* by authors who then ask that the defined term carry the stipulated meaning consistently throughout the discussion regardless of how others have defined the term. Unlike stipulative definitions, descriptive definitions do not depend on the usage suggestions of authors. Instead, descriptive definitions attempt to adequately describe the defined term or the way the word is used. Dictionary definitions are examples of descriptive definitions because they frequently provide alternative definitions due to the fact that many words have multiple descriptive meanings. As a result, there is not a single descriptive definition for any single word in most cases but many definitions describing the appropriate uses of that word in differing contexts.

The third type of definition described by Scheffler, the programmatic definition, is *formulated* to convey both explicitly and implicitly how a specific word *ought* to be defined. Formulating what a word should mean is clearly different from employing a dictionary definition or declaring that a word will carry a particular meaning in a particular instance or circumstance. Programmatic definitions are frequently "mixtures of the is and the ought" (Scheffler, 1960, p. 5), or of descriptive and stipulative definitions (Scheffler, 1960). The formulation of a programmatic definition is the approach used in the current development to establish a standard teacher autonomy definition.

The underlying hypothesis of this development supposes that teacher autonomy carries a compound, complex, multi-dimensional self-governance connotation that is context specific. In other words, teacher autonomy is more than one or the sum of its individual parts and is sufficiently multifaceted that it is probably best described and understood in terms of a metaphor. So to justify the inclusion of particular words in the definition, key words used in previous descriptive and stipulative definitions are identified and the synonymatic relationships between them are examined and considered within the context of the metaphor. In addition, relevant ideas and elements from human motivation, job satisfaction, and public policy theories are integrated. Then, the consequential productive processes that teachers perform or can potentially perform in schools are presented and incorporated.

Descriptive Autonomy Definitions

To uncover the basic building blocks of a programmatic definition, we begin with an examination of the descriptive definitions offered in the Merriam-Webster (MW) on-line dictionary. Consistent with the descriptive form Scheffler (1960) described, MW offers several, context dependent, autonomy definitions including "1: the quality or state of being self-governing, 2: self-directing freedom and especially moral independence, and 3: having the right or power of self-governance" (Autonomy, n.d.). While all of MW's descriptive definitions are straightforward, none have been used verbatim in research because authors have instead elected to employ stipulative definitions. However, the implicit or explicit use of the key words, *freedom*, *independence*, and *power* in the MW descriptive definitions are well represented in stipulative definitions. So, as a first step in constructing a uniquely meaningful programmatic definition of teacher autonomy,

an examination of key words used in descriptive definitions as well as their connections and relationships to each other and to stipulative autonomy definitions is considered.

The metaphor selected for this examination suggests that the word autonomy can be likened to a complex structural equation model (SEM). In this scenario, autonomy is modeled by a second-order factor which underlies other complex words which are represented as first-order factors and first-order factors then reflected in relatively simple or more one-dimensional words called elements or indicators (see Figure 1).

Figure 1 symbolizes the SEM metaphor one way to conceptualize pathway relationships that connect descriptive definitions of autonomy to the aforementioned key words of stipulative definitions. Key words in each author's stipulative autonomy definition are analyzed via the pathways of Figure 1 to determine if the words can be conceptualized as autonomy factors or indicators or possibly both.

As was hypothesized, the structure of Figure 1 suggests that autonomy can be modeled as a second-order factor that underlies first-order factors (i.e., power and freedom) which are indicated by indicators or elements (i.e., discretion, control, and influence). Generally then, Figure 1 posits key words as first-order factors when they are either synonymous with autonomy or if they figure prominently in the descriptive definitions. A word is considered an indicator if that word can be related to autonomy indirectly through a first-order factor.

Stipulative Autonomy Definitions

Pitt (2010) describes autonomy as "a common trait among modern, educated human beings that refers to the being's independence from external influence and freedom of the will" (p. 1). The key words *freedom, independence,* and *influence* in Pitt's

stipulative definition are represented in Figure 1. Figure 1 indicates that freedom is synonymous with both autonomy and independence, and moreover, freedom explicitly appears in MW's descriptive autonomy definitions. According to Figure 1 then, the relationship just described would make freedom and independence first-order factors of autonomy because of the synonymous relationship between the two and their prominence in MW's descriptive definitions. Likewise, *power* figures prominently in the MW autonomy definitions and is therefore conceptualized as a factor. Influence is understood as an autonomy indicator due to its indirect relationship through the factor power.

In sum then, we might conclude that Pitt's stipulation is consistent with a second-order autonomy conceptualization that underlies the first-order factors freedom, power, and independence. Those terms were determined to be first-order factors because of the synonymous relationships depicted in Figure 1 and because they explicitly appear in MW's autonomy definition. Further, Figure 1 suggests that influence can be considered an indicator because of the word's indirect relationship to autonomy through the first-order factor power.

Pearson and Moomaw (2005, p. 42) stipulate that teacher autonomy is: "Teachers' feelings of whether they control themselves and their work environments." One of the ways that the key word *control* defined as: "1: to exercise restraining or directing influence over, 2: to have power over, 3: to rule" (Control, n.d.) can be traced to autonomy in Figure 1 is by the presence of the word influence in the MW descriptive definition of control. Because influence was previously posited as an indicator,

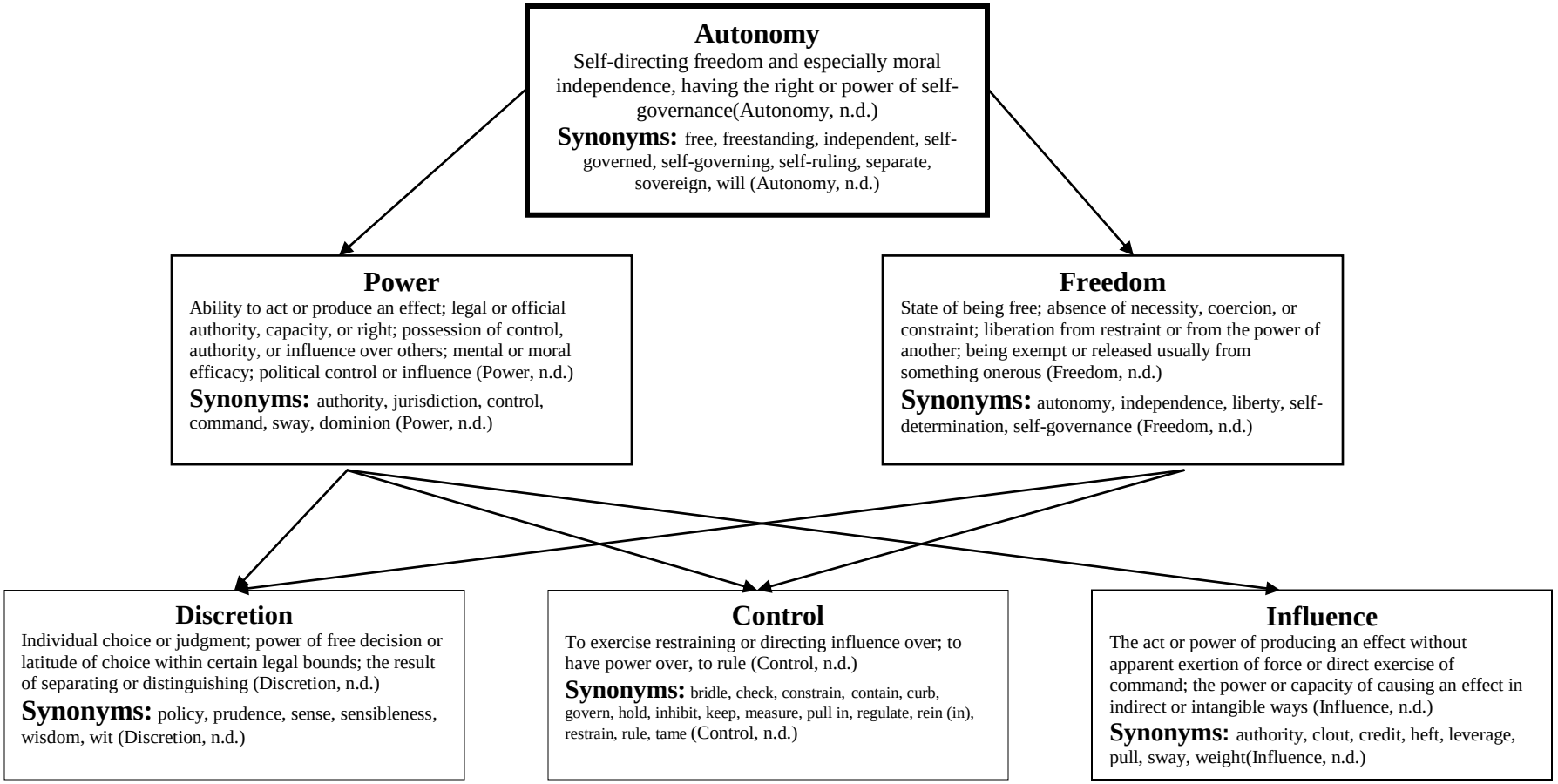


Figure 1. Pathway relationships to Webster's descriptive definition among the key words used in the stipulative autonomy definitions used in the literature. Note: All descriptive definitions and synonyms are taken from the Merriam-Webster on-line dictionary.

and influence is used to descriptively define control; control can likewise be cast as an indicator. Alternatively, control could be understood as a first-order factor by observing that power and control are synonymous and because power was previously shown to be a first-order factor. Thus, the Pearson and Hall (1993), Pearson and Moomaw (2005, 2006) definition would appear to represent, at best, only a first-order factor of autonomy; not the second-order conceptualization modeled by the Figure 1 metaphor.

Kreis and Young Brockopp (2001), employ Porter's stipulation which posits teacher autonomy as "control, influence, participation, and authority" Porter (1963, p. 389). Control and influence were previously conceptualized as indicators according to Figure 1. *Authority* can be connected to autonomy by observing the synonymous relationship authority has with influence and control which would suggest that authority is an indicator. Alternately, authority could be considered a first-order factor due to the word's explicit appearance in the definition of power.

Turning to *participation*, a word not observed to be related to any of the key words in Figure 1, one can only suppose that its inclusion in the Porter (1963) definition is a matter of logic. From that standpoint, autonomy would be impossible for situational nonparticipants, or rather, to ensure that a conversation about autonomy is relevant to the subjects under investigation; Porter may have required that actors participate in some mutual frame of reference. Support for that interpretation is found in Sergiovanni and Carver's (1980) investigation of autonomy components that identified control, influence, authority, and participation as did Porter. However, Sergiovanni and Carver specified that the presence of the word participation was intended to signify that autonomous workers perceive themselves to be participants and/or stakeholders.

In sum, the Porter (1963) definition employed by Kreis and Young Brockopp (2001) conforms to the second-order profile of the metaphor with control and influence acting as indicators and authority possibly functioning as a first-order factor. Be that as it may, the definition lacks more substantial first-order factors such as power, freedom, and independence that play significant roles in the descriptive definitions.

Friedman (1999, p. 60) stipulates that teacher autonomy is: "a bestowal or generation of teacher power." Similar to the Pearson and Hall (1993), Pearson and Moomaw (2005, 2006) definition which heavily relies on the single word control, Friedman hangs his hat on the word *power* which suggests that power is ostensibly interchangeable with autonomy even though power was previously posited in this development to be but a part of autonomy (i.e., a first-order factor). In other words, while power is an important part of autonomy, this effort suggests that it is not autonomy. Therefore, Friedman's definition would seem to be at odds with the second-order structure represented by Figure 1.

Ingersoll (1996, p. 165) suggests that decision making power by teachers is: "…autonomy exercised by individual teachers over planning and teaching decisions in their classrooms or over the collective influence of faculties over school policies…." The implication is that teacher decision making power is itself teacher autonomy. The key word *influence*, previously categorized as an indicator, appears in Ingersoll's autonomy stipulation. In addition, a new key word, *discretion*, is implied. According to the Merriam-Webster (MW) on-line dictionary, discretion is defined as "1: individual choice or judgment, 2: power of free decision or latitude of choice within certain legal bounds, 3: the result of separating or distinguishing" (Discretion, n.d.). The word *free* suggests

freedom, a word previously posited as a first-order factor of autonomy. So if freedom underlies discretion and freedom is an autonomy factor, one way discretion could be conceptualized is as an indicator. Alternatively, discretion could be understood as a first-order factor because the factor power appears explicitly in one of the MW descriptive discretion definitions. Generally then, Ingersoll's conceptualization of teacher decision making power as teacher autonomy conforms to a second-order factor metaphor. However, equating teacher decision making power and autonomy is a bit unsettling because this inquiry prefers to posit discretion as a part of autonomy; not autonomy itself.

Hackman and Oldham (1976, p. 258) defines autonomy as "The degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling the work and determining the procedures to be used in carrying it out." Similar to the Pitt stipulation and more importantly to MW's descriptive definitions, Hackman and Oldham's definition utilizes the first-order factors freedom and independence. In addition, discretion explicitly appears a word that will later be shown to have substantial meaning for teachers at work.

Because the Hackman and Oldham definition: (a) has been the most widely implemented in research (Fried & Ferris, 1987; Loher et al., 1985), (b) utilizes powerful first-order factors, (i.e., independence and freedom) and, (c) speaks specifically to the work context, it best represents the second-order SEM metaphor and is therefore the most robust yet presented.

A Programmatic Definition: First Steps

Clearly, authors have defined autonomy in a number of ways each, according to the preceding discussion, capturing to greater or lesser extents, the spirit of MW's

descriptive definitions. However, no definition yet examined has adequately fleshed-out a teacher specific autonomy definition that this development seeks to establish for the K-12 context. So, as a first evolutionary step in formulating a programmatic definition; the Hackman and Oldham (1976) stipulation is selected as a foundation upon which to build. It is important to note however that while the Hackman and Oldham definition has been used extensively in business and industry research; it has rarely been used for teacher research. That is problematic because research that suggests education organizations are more dissimilar than similar to business and industry settings (Firestone, 1996). For example, in contrast to private sector employees, teachers are often isolated from continuous interactions with other adults, generally work in flat organizational structures, and have little or no chance for advancement (Barnabe & Burns, 1994). Hence, the Hackman and Oldham stipulation must be modified to better capture the realities of teaching.

As a second step, significant key words in MW's autonomy definitions, as well as words that modify the definition specifically for teaching are placed/replaced in the Hackman and Oldham definition. First *teaching* replaces *job* for obvious reasons and including *power* in the base definition implies the inclusion of its synonym *control.* Moreover, because the influence is used to define power, it can be fairly asserted that every key word, from all of the stipulative definitions previously analyzed, are now explicitly or implicitly represented in one expression. In addition, the word *employee* is replaced with *participate* to acknowledge previously presented theory which suggests that the ability to participate is a fundamental prerequisite of autonomy. So for now, the programmatic teacher autonomy definition is: *The degree to which teaching provides*

substantial freedom, independence, power, and discretion to participate in scheduling the work and determining the procedures to be used in carrying it out.

Key Words in Human Motivation Theory

Autonomy has been conceptualized as an absolute need of individuals, both in their personal and in their professional lives (Maslow, 1943; Herzberg, Mausner & Snyderman, 1959; Porter, 1963). In his theory of human motivation, Maslow (1943) described human needs as hierarchically ordered beginning with the most basic physiological needs and progressing -- dependent on the satisfaction of the prior -- through the needs for safety, love, esteem, and self-actualization. It is within the esteem need where the need for autonomy can be conceived to exist.

Maslow believed that normal people need a firmly based high evaluation of themselves to achieve self-respect, self-esteem, and the esteem of others. He classified esteem needs into two subsets. Subset I contains desires for strength, achievement, adequacy, confidence, *independence,* and *freedom* while subset II includes desires for reputation or prestige which are comprised of recognition, attention, importance or appreciation (Maslow, 1943). Considered in relation to the key words used to formulate the programmatic definition as developed thus far, autonomy may exist at the intersection of the Maslow esteem need subsets.

Autonomy Conceptualized as the Intersection
of Maslow's Subsets of Esteem Needs

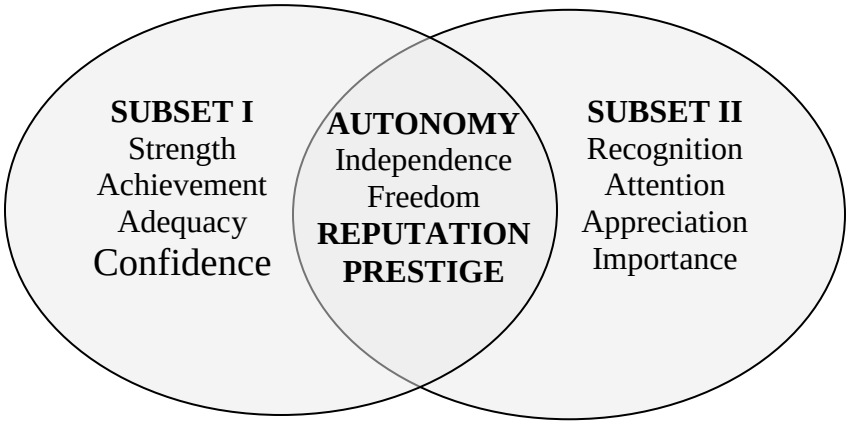


Figure 2. Autonomy conceptualized as the intersection of Maslow's esteem need subsets

Figure 2 depicts subset I, subset II and the intersection between the two esteem need subsets that the figure suggests implicitly represents autonomy. The intersection contains the words independence and freedom from subset I; words that are explicitly used in MW's definitions of autonomy and depicted as important autonomy factors in Figure 1. All of the items included in subset II, represented by the words *reputation* and *prestige* are placed in the intersection as well. All of the subset II items are placed in the autonomy intersection because they can be thought of as resultants of interaction with other people or *participation*, a word that figures prominently in the Porter (1963) stipulation and now in the evolving programmatic definition.

While Figure 2 certainly suggests that an autonomy need is implied in Maslow's theories; Porter's (1963) structure makes the need for autonomy explicit. Buildings upon Maslow's hierarchical need structure; Porter believed that the human need for autonomy

is so important that he modified Maslow's structure by adding an need for autonomy and placing it as second highest in his own hierarchical structure.

Key Words in Job Satisfaction and Public Policy Theory

Herzberg et al. (1959) extended Maslow's (1943) theory to the workplace by claiming that worker dissatisfaction is reduced when lower level physiological needs are met. However, the authors emphasized that worker satisfaction is realized only when higher level needs, such as autonomy, are fulfilled. That assertion aligns with iconic public policy theory which suggests that certain workers actually *require* autonomy for success.

Public service workers (e.g., healthcare workers, police officers, social workers, and teachers) who interact directly with citizens are employees that Lipsky (1980) called street-level-bureaucrats (SLBs). In his seminal work *Street-Level Bureaucracy: Dilemmas of the Individual in Public Services*, Lipsky suggested that SLBs *must* be afforded substantial workplace autonomy because particular characteristics of their jobs make doing their work difficult if not impossible without autonomy for at least two reasons. First, the situations faced by SLBs are often too complicated for programmatic formats to envelop. Second, SLBs are almost always faced with inherently complicated challenges which require response in human terms (Taylor, 2007). For those reasons, Lipsky argued that SLBs must possess on-the-spot *freedom*, *independence, power*, and *discretion* to apply sensitive observation and judgment in instances not explicitly covered by rules, regulations, or instructions (Lipsky, 1980). In other words, Lipsky believed that because SLBs disperse benefits and allocate public sanctions on the front lines; they create policy at the individual level and therefore need autonomy to be effective and

moreover, to *cope* with pressurized face-to face client interactions (Lipsky, 1980; Taylor, 2007).

While Lipsky did not offer an explicit definition for autonomy, much like Ingersoll (1996), he seems to use the words autonomy and discretion interchangeably. For that reason, Lipsky's SLB theory again supports the importance of including discretion in the programmatic definition because he suggests that discretion (autonomy) is indispensable to teachers as SLBs.

Up to now, the evolving programmatic teacher autonomy definition has been shaped by a metaphor which suggests the inclusion of particular key words and by theory which indicates that those words are supported by human motivation, job satisfaction, and public policy theory. Those theories suggest that autonomy: (a) is a basic prerequisite for higher levels of private and professional satisfaction, and (b) is a must for teachers to function effectively in their roles as street-level-bureaucrats. However, a more comprehensive and complete definition requires the inclusion of the consequential activities and functions that teachers perform in schools so that the domains over which teachers properly exercise autonomy can be represented.

Consequential Productive Activities

Theorists have long believed that allowing employees more power in decision-making (i.e., *discretion*) and more *freedom* to think and act can indeed improve organizational efficiency (Conway, 1984; Conley, Schmidle & Shedd, 1988; Morgan, 1997; Smylie, 1992). This scholarship emphasizes the idea that that hierarchical organizational structures, where decision making is the prevue of those in the upper echelons, are less effective than organizations in which decision making is decentralized.

In fact, flatter, less centralized organizations featuring more decentralized authority structures have been observed to achieve better than traditional top-down bureaucracies (Blasé & Blasé, 1996). However, the effect of power distribution depends on who controls the consequential productive activities performed in schools (Ingersoll, 1996). The most significant productive processes and activities in schools; administrative, technical or productive, and socialization and sorting; are often perceived to exist in two separate zones – the schoolwide and classroom (Ingersoll, 1996; Lortie, 1969).

Administrators generally perform processes such as management, planning, resource allocation, and school coordination. These processes are known as schoolwide zone activities due to the fact that they affect the school organization as a whole (Ingersoll, 1996; Lortie, 1969).

Teachers perform the lion's share of technical or productive core processes which consist mainly of teaching and educational activities (e.g., selecting teaching techniques, evaluating student academic performance, deciding the amount of homework to assign). Those activities primarily affect individual teachers and their students in a single classroom, so logically; those activities are characterized as classroom zone activities (Ingersoll, 1996; Lortie, 1969).

The socialization and sorting processes of schooling; functions that Ingersoll (1996) stresses are possibly more consequential from a societal standpoint than any of the other activities teachers engage in; can occur in either the classroom or schoolwide zones. Socialization, or the inculcation of societal norms and behaviors, and sorting, the differentiation of roles for the reproduction of societal stratification patterns are essential

because they are instrumental in the production of future citizens and the reproduction of the prevailing social order (Ingersoll, 1996).

One school of thought, traditionalism, asserts that teachers should have high levels of autonomy over classroom zone activities while mostly ceding schoolwide activities to administrators (Firestone, 1996). Similarly, the other school, decentralism, also believes that teachers should have high levels of autonomy over classroom zone activities. However, decentralists believe that teachers should appropriately possess some degree of autonomy over the schoolwide zone as well -- even while research suggests that teachers have little or no influence over administrative matters (Conley & Cooper, 1991).

It is fair to say then that traditionalists and those who believe schools should be more decentralized would agree on the proposition that the division of labor and power in schools conform to a more traditional influence pattern where administrators make strategic decisions outside the classrooms (schoolwide zone) and teachers make operational decisions inside the classrooms (classroom zone) (Conley & Cooper, 1991). However, Ingersoll (1996) stresses that teachers perform activities and functions in both zones. Thus, incorporating the consequential productive activities that teachers perform in schools as well as the zones of dominion where those activities take place is important if a standard uniquely meaningful teacher autonomy definition is to be achieved.

A Standard Definition of Teacher Autonomy

The latest programmatic iteration: *The degree to which teaching provides substantial freedom, independence, power, and discretion to participate in scheduling the work and determining the procedures to be used in carrying it out*, as yet, does not speak specifically to the core productive activities that teachers perform as an standard research

definition of teacher autonomy ought to do. To that end, the word *work* in the present formulation (seen as a place holder for the consequential productive activities performed by teachers) is replaced to acknowledge the instruction, administration, and socialization and sorting that teacher perform in the classroom and in the greater school organization. After revision, teacher autonomy is then defined as: *The degree to which teaching provides substantial freedom, independence, power, and discretion to participate in scheduling, selecting, and executing administrative, instructional, and socialization and sorting activities both in the classroom and in the school organization at large.* The definition now includes the important productive activities over which the literature suggests teachers should be, to greater or lesser extents, autonomous. In addition, the phrase, *in the classroom and in the school organization at large*, is inserted to acknowledge the theoretically possible realms of teacher dominion.

Like previous iterations, the final definition features powerful key words (independence, freedom, and power) which imply the inclusion of more one-dimensional elements like control, influence, and discretion. The word *participate* is also included because participation was shown to be a fundamental prerequisite of autonomy. In addition, the final definition now acknowledges the consequential activities that teachers perform in the classroom and in the schoolwide organization. Therefore, this latest programmatic formulation meets the purpose of exercise which was to establish a standard, comprehensive, and uniquely meaningful teacher autonomy definition.

Discussion/Conclusion

It is logical to suspect that the large assortment of autonomy definitions exits because researchers and lay people alike believe they know what autonomy is. Some past

inquires (i.e., Hackman & Oldham, 1975, 1976; Kreis & Young Brockopp, 2001; Pitt, 2010; Porter, 1963) have established autonomy definitions that support complex constructs. On the other hand, other efforts (e.g., Friedman, 1999; Ingersoll, 1996; Pearson & Hall, 1993; Pearson & Moomaw, 2005, 2006) have defined autonomy using as little as one key word (e.g., power, discretion, and control). Definitions of that type were described as capturing only a part of autonomy's meaning; not autonomy itself. Curiously, despite the simple nature of the aforementioned definitions, the measurement models employed by those research efforts were in fact, complex multi-facetted models, examples of the previously mentioned definition-measurement model mismatches.

The number of and disparate nature of autonomy conceptualizations create an 'apples and oranges' scenario, making the findings and comparing the findings of teacher autonomy inquires dubious. Moreover, the inconsistency between inquiry definitions, and the occasional incongruity of definitions and measurement models within individual studies, provides grounds to question whether research is in fact capturing autonomy, components of autonomy, or something else altogether. Obviously then, establishing a standard definition of teacher autonomy is important so that future research can benefit from a common benchmark.

The teacher autonomy definition formulated in this inquiry has created such a benchmark by:

1. Utilizing an industry/business autonomy definition (i.e., Hackman & Oldham, 1976) as the "chassis' upon which to build because it: (a) contains many of the key words used by descriptive and stipulative autonomy definitions (e.g., freedom, independence, power), (b) has been operationalized in the vetted and

widely implemented Job Characteristic Model of job satisfaction (Fried & Ferris, 1987; Loher et al., 1985), and (c) has been successfully applied in teacher job satisfaction research (Barnabe & Burns, 1994; Cohrs et al., 2006).

2. Analyzing and incorporating additional key words from past stipulative/descriptive definitions as well as concepts employed by human motivation, job satisfaction, and public policy theory (e.g., participation, discretion).
3. Integrating the consequential productive activities that teachers perform in schools as well as the zones of dominion where those activities take place.

The most significant contribution is that the definition informs an understanding of what teacher autonomy is and what it is not. Teacher autonomy as defined herein is an amalgamation of key words and should not be equated with any single word or factor. For example, the teacher autonomy definition employed by Pearson and Hall (1993): teachers' feelings of whether they control themselves and their work environments, seems to equate control with autonomy -- even while the researchers' measurement model is multidimensional (uses 18 observable indicators to infer two first-order factors using structural equation modeling techniques). One-dimensional teacher autonomy definitions are problematic because for example, if a teacher merely has *control* over student behaviour in the classroom and does not have *influence* over the formulation of schoolwide conduct policy, the teacher may have limited *discretion* over what is considered a violation. On the other hand if a teacher has autonomy, particularly as it has been formulated here, over classroom conduct he or she will also influence the policy that defines acceptable student behavior which in turn enhances discretion when dealing with

transgressions. The point here again is that stipulative, one-dimensional autonomy definitions capture only a fraction of what this inquiry believes autonomy actually is; a complex multi-dimensional concept that is more than one or the sum of its parts.

An additional and significant contribution is that the standard definition can guide researchers in the creation or identification of items for use in future teacher autonomy constructs. In other words, the standard definition provides a template that researchers can use to create authentic autonomy survey items or by which they can identify pre-existing autonomy indicators.

This inquiry has argued that autonomy is an absolute need of teachers in their professional lives (Herzberg et al., 1959; Maslow, 1943; Lipsky, 1980; Porter, 1963) and higher levels of autonomy correlate positively with higher levels of job satisfaction (Barnabe & Burns, 1994; Cohrs et al., 2006; Fried & Ferris, 1987; Kreis & Young Brockopp, 2001; Loher et al., 1985; Pearson & Moomaw, 2005, 2006). Because job satisfaction is related to attrition, and because current K-12 policy initiatives affect teacher autonomy (Ingersoll, 1996, 2007; Quiocho & Stall, 2008), the practices inspired by those policies may be contributing to unacceptably high teacher attrition rates. For those reasons, the teacher autonomy definition formulated in this inquiry is needed so that research can benefit from a common benchmark. Hopefully the definition will provide a tool to promote and support more effective examinations of persistent and pressing problems in education.

Chapter 3: Initial Construct Validation of the Schools and Staffing Survey Scale for Teacher Autonomy (SASS-STA)

For over 30 years, theorists and scholars have argued that improving employees' autonomy by promoting greater staff power in decision-making and more freedom to think and act can improve organizational efficiency (Conley, Schmidle & Shedd, 1988; Conway, 1984; Luthans, 1992; Morgan, 1997; Smylie, 1992). Those scholars emphasize the idea that flatter less centralized organizations with more decentralized authority configurations achieve better than traditional top-down bureaucratic structures. In fact, research supports the notion that that traditional hierarchical organizational arrangements -- or structures where decision making is the prevue of those in the upper echelons only -- are less effective than organizations that feature decentralized decision making (Blasé & Blasé, 1996). Those types of findings should come as no surprise given that individuals need autonomy in their personal and in their professional lives (Herzberg, Mausner & Snyderman, 1959; Maslow, 1943; Porter, 1963).

Organizational psychology has long recognized autonomy as an important predictor of job satisfaction (Hackman & Lawler, 1971; Hackman & Oldham, 1975, 1976; Porter, 1963), and in turn, job satisfaction has been shown to be associated with important work outcomes including job performance levels, organizational commitment, life satisfaction, absenteeism, lateness, and attrition (Judge, Heller, & Mount, 2002; Warr, 1999). However, in direct contradiction to research that has shown higher levels of autonomy correlate positively with higher levels of job satisfaction; (Barnabe & Burns, 1994; Cohrs, Abele & Dette, 2006; Fried & Ferris, 1987; Loher, Noe, Moeller &

Fitzgerald, 1985) recent accountability policies inspired by the reauthorization of the Elementary and Secondary Education Act of 2001 (i.e., No Child Left Behind (NCLB)) may have the effect of diminishing teacher autonomy (Ingersoll, 1996, 2007; Quiocho & Stall, 2008).

Ingersoll (2007) explains that "popular -- but flawed -- perspectives on the problem of ensuring teacher quality have to do with the control and accountability of the teaching force" (p. 21). Ingersoll posits that those who subscribe to that perspective believe that teachers often suffer from deficits in ability, commitment, and effort and have not been held accountable or properly supervised in the past. As a result they believe that teachers do as they please in their work with students and have little regard for quality. Proponents of this viewpoint advance their argument by citing unflattering international academic rankings and faltering economic competitiveness as proof that the quality of the U.S. public school system is in decline (Ingersoll, 2007). To remedy the situation they believe more stringent teacher accountability policies are needed to restrain the autonomy of teachers (Crisafulli, 2006; Ingersoll, 2007; Quiocho & Stall, 2008) in order to ensure that the work teachers do with students is effectively supervised and controlled.

Restraining the autonomy of certain teachers may be one of the most significant outcomes of NCLB. This is so because for the first time in American history, NCLB linked the future of districts and the livelihoods of some of the educators who work in them to the ability of students to meet standardized assessment performance targets (Crisafulli, 2006). In response, districts have sought to bolster particular measures of student achievement (e.g., English language arts, mathematics) by instituting an

increasing number of prescribed curriculums, pedagogy approaches, and instructional materials (Crocco & Costigan, 2007; Day, 2002; Quiocho & Stall, 2008). This turn of events would logically modify, reduce, or outright clash with the autonomy of teachers (Blasé & Matthews, 1984; Crocco & Costigan, 2007; Day, 2002; Ingersoll, 1996, 2007; Kreis & Young Brockopp, 2001; Pearson & Moomaw, 2005; Quiocho & Stall, 2008; Wirt & Kirst, 2005).

This study seeks to create a valid, reliable, and nationally generalizable autonomy construct designed specifically for teaching. The construct is needed as recent educational policy measures have the potential to affect teacher autonomy (Day, 2002; Gawlik, 2007; Wirt & Kirst, 2005), a construct linked to the job satisfaction of teachers (Kreis & Young Brockopp, 2001; Pearson & Moomaw, 2005), and to teacher turnover (Crocco & Costigan, 2007; Ingersoll, 1996; Liu, 2007).

Previous teacher autonomy measurement models and scales have often been developed using small convenience samples or international data, a circumstance that contributes to obvious generalization limitations. Moreover, samples sizes have generally been too small to reliably analyze and/or compare teacher subgroups; a situation that has eliminated the possibility of interstate or interdisciplinary investigations. Therefore, the goal of this inquiry is to derive and initially validate a national teaching autonomy measurement model that can overcome the aforementioned limitations.

To realize success, this inquiry employs the most extensive and comprehensive data source available on the staffing, occupational, and organizational aspects of U.S. schools -- the U.S. Department of Education's National Center for Education Statistics (NCES) Schools and Staffing Survey (SASS). By utilizing SASS data and structural

equation modeling techniques, this inquiry aims to establish and validate a Schools and Staffing Survey - Scale for Teacher Autonomy (SASS-STA) a nationally representative model designed to capture the elusive and complicated nature of teacher autonomy. Successfully deriving such a teacher autonomy construct can provide a powerful tool for use in research models that seek to explore interactions among other salient leadership, organizational, and occupational variables or constructs.

To establish the construct as authentic and reliable, this inquiry first develops a set of potential autonomy indicators from items available in the 1999-2000 and 2003-2004 SASS data sets. The items will then undergo exploratory factor analysis and the resulting factors will be compared to those in the extant literature. Confirmatory factor analysis using structural equation modeling (SEM) techniques will then be employed to assess several hypothesized measurement models including a second-order model that this inquiry believes will best represent teacher autonomy. After a final measurement model for is chosen and perfected based on theory and SEM fit indices, cross-validation will be achieved by using the 2003-2004 SASS data. Lastly, to verify the model will generalize across relevant teacher subgroups, measurement invariance will be investigated using SEM multiple group analysis within the 1999-2000 and 2003-2004 SASS teacher samples.

Selecting SASS Items for a Roster of Potential Autonomy Indicators

Unlike previous multidimensional teacher autonomy constructs which were established using inquiry specific, researcher generated survey instruments (e.g., Friedman, 1999; Kreis & Young Brockopp, 2001; Pearson & Hall, 1993; Pearson & Moomaw, 2005, 2006), SASS-STA indicators preexist in the SASS 1999-2000 and 2003-

2004 Teacher Questionnaire items. So, justification for the inclusion of specific SASS items must be based on some underlying theory of what teacher autonomy actually is. This inquiry employs two benchmarks by which SASS items will be judged appropriate for potential inclusion in the SASS-STA -- Gwaltney's (2012a) programmatic teacher autonomy definition (benchmark I (B1)) and benchmark II (B2), a framework that vets potential SASS items by comparing them to the indicators used in previous autonomy measurement models.

Benchmark I: A Programmatic Definition of Teacher Autonomy

Gwaltney (2012a) defined teacher autonomy as: the degree to which teaching provides substantial freedom, independence, power, and discretion to participate in scheduling, selecting, and executing administrative, instructional, and socialization and sorting activities both in the classroom and in the school organization at large. The programmatic definition was formulated to convey what teacher autonomy *ought* to mean (Scheffler, 1960). For that reason, it was crafted to support a second-order latent construct reflected in first-order factors which are indicated by measureable observable items (Gwaltney, 2012a).

Benchmark I (B1) suggests that SASS items selected as prospective SASS-STA indicators should: (a) include important key words (e.g., control, influence, discretion, freedom, independence), (b) refer to the consequential classroom zone (CRZ) (e.g., teaching, discipline, evaluation) and schoolwide zone (SWZ) (e.g., management, planning, resource allocation and school coordination) functions and activities, and/or (c) describe socialization (i.e.; the inculcation of societal norms and behaviors) and/or

sorting (i.e., the differentiation of roles for societal pattern reproduction) (Ingersoll, 1996; Lortie, 1969) activities that can occur in either zone of activity (Gwaltney, 2012a).

Benchmark II: Friedman's Teacher Work Autonomy Scale (TWA)

Friedman (1999) collected the actual workplace autonomy perceptions of Israeli educators. The major areas of teacher work autonomy were then extracted using common content analysis and validation of those areas was achieved using teachers and principals as expert judges. Four factors emerged.

Factor I -- Student Teaching and Assessment, is indicated by items that measure classroom practice of student attainment, evaluation, norms for student behavior, physical environment, and different teaching emphases on components of mandatory curriculum. Factor II -- School Mode of Operating, underlies indicators that include establishing school goals and vision, budget allocations, school pedagogic tendencies, and school policy regarding class composition and student admission. Indicators that describe determining the subjects, time schedule, and procedures of in-service training of teachers as part of the general school practice indicate Factor III -- Staff Development. Lastly, Factor IV -- Curriculum Development is quantified by teacher introduction of new homemade or imported curricula as well as initiation of major changes in existing formal and informal curricula.

Because the TWA uses the actual perceptions of teachers, establishes more theory supported autonomy factors than any other construct in the extant literature, and because those factors are indicated by an extensive and comprehensive set of items that well describe the consequential productive activities that teachers perform; the TWA is an exemplar of what is important to teacher autonomy. Moreover, because the TWA

presents a multidimensional conceptualization of teacher autonomy that is consistent with Gwaltney's (2012a) teacher autonomy definition (i.e., B1), the four factors of the TWA are used from this point forward as the benchmark II (B2) framework.

The tables of Appendix 3A constitute the B2 framework. When available, each of the individual autonomy indicators employed by the studies included in this review is categorized in relationship to the B2 teacher autonomy factors. Each table of Appendix 3A identifies the study considered, and then when reasonably possible, assigns each indicator to one and only one of the four factors. Additionally, and again when reasonably possible, each indicator is also assigned to either the schoolwide zone (SWZ) or classroom zone (CRZ). It should be noted however that classification of ambiguously worded items can be subjective. Therefore, fair minded people can disagree when categorizing those indicators. Moreover, ambiguously worded autonomy indicators defy classification under single factors or zones. When that occurred, the indicator was classified as applying to all factors and/or zones that seemed to apply.

Category I Studies: Complex Autonomy Constructs Underlying Customized Survey Items

Research efforts that are similar to Friedman's (1999) effort are referred to in this inquiry as Category I studies (i.e., Friedman, 1999; Kreis & Young Brockopp, 2001; Pearson & Hall, 1993; Pearson & Moomaw, 2005, 2006). Category I efforts posit teacher autonomy as complex conceptualizations underpinned by inquiry specific, researcher customized, survey instruments that are derived form the perceptions of teachers. These "horses' mouth" survey items have obvious, convincing, and compelling face validity. Thus, the great strength of Category I efforts is that they describe the degree to which

teachers -- not some other type of worker -- believe they have organizational and/or pedegological autonomy.

Pearson and Hall's Teacher Autonomy Scale (TAS). Pearson and Hall (1993), Pearson and Moomaw (2005, 2006) developed and validated the Teaching Autonomy Scale (TAS) using samples of Florida public school teachers (N < 204). The TAS is comprised of 18 indicators which underlie two latent first-order factors called curriculum autonomy (selection of instructional activities and materials and planning and sequencing) and general teaching autonomy (classroom standards of conduct and personal on-the-job decision making) (Pearson & Hall, 1993; Pearson & Moomaw, 2005, 2006).

TAS indicators contain key words like autonomy, control, discretion, and free as well as phrases such as use my own, and say over which imply independence, power and/or freedom (Gwaltney, 2012a). Moreover, most of the items refer to specific consequential productive activities that teachers perform in school. For those reasons, the items conform to B1. Appendix 3A, Table 3A1 classifies the indicators under the four Friedman (1999) factors of B2.

Nine of the indicators were placed under Factor I, CRZ. Two items were placed under Factor II, SWZ, and five were classified as Factor IV, SWZ. No indicators could be assigned to Factor III (professional development) and two of the TAS indicators defied classification under a single B2 factor or zone. The indicators: In my situation, I have only limited latitude in how major problems are solved, and My job does not allow for much discretion on my part, were so vague that they could be classified under each of the four B2 factors and both zones. This is so because the wording of those items makes no

specific reference to any productive school activity or any particular zone of activity. For those reasons, the items were identified as general autonomy indicators.

Kreis and Young Brockopp's Perceived Autonomy Scale (PAS). Kreis and Young Brockopp (2001) employed a convenience sample of 60 Western New York State teachers (34 parochial and 26 public) to create the Perceived Autonomy Scale (PAS). In line with the notion of classroom and schoolwide zone autonomy, the PAS measures teacher perceptions of autonomy inside the classroom and within the school but outside of the classroom. In addition, the PAS measures an overall perception of autonomy within one's current teaching position. Using the PAS the researchers found teacher autonomy inside the classroom contributes most to job satisfaction and that parochial school teachers perceive greater autonomy levels overall and greater levels of SWZ autonomy than their public school counterparts. Unfortunately, the Kreis and Young Brockopp (2001) article did not disclose the ten custom survey items (five CRZ and five SWZ) used to underpin the PAS; so they could not be categorized in the B2 framework.

Category II Studies: Potential Autonomy Indicators in the Schools and Staffing Survey

Because Category I efforts have often utilized small, single-school, single-district, single-state, or international data samples, a serious shortcoming is result generalizability. Category II inquiries are not so limited because they, as does the current investigation, take advantage of the vast preexisting Schools and Staffing Survey (SASS) data. However, unlike the aim of the current endeavor, Category II inquires have not established autonomy constructs per se. Rather, they utilize SASS survey items that are worded in terms of important autonomy indicators (i.e., discretion, influence, and control) (Gwaltney, 2012a) and speak about consequential CRZ and SWZ activities to explore

various organizational outcomes. Therefore, classifying Category II SASS items within the B2 framework can aid in suggesting and justifying the use of the same or similar items in a new teacher autonomy construct.

Liu's SASS teacher influence indicators. Liu (2007) examined the effect of perceived teacher influence over school policy on first-year teacher attrition using a sample of 11,349 first-year teachers contained in the 1999-2000 SASS and the 2000-2001 Teacher Follow-up Survey. Liu found as teacher influence over school policy increased that the first-year teachers had dramatically decreased probabilities of leaving the profession and were more likely to stay at their schools after the first year of employment.

The items (i.e., 57 a-g in the 1999-2000 SASS Teacher Questionnaire) used by Liu conform to B1 because they are couched in terms of the keyword influence (Gwaltney, 2012), and because the items refer to consequential activities performed by teachers in the schools. Furthermore, the items conform to B2 because all seven were easily classified in Appendix 3A, Table 3A2. Three of the items were listed under Factor II: School Mode of Operating, SWZ. Three were listed under Factor III: Staff Development, SWZ. Lastly, one item was categorized as most like the indicators of Factor IV: Curriculum Development, SWZ.

Ingersoll's SASS teacher autonomy and influence indicators. Using 1987-1988 SASS data that represented 2,939 public and private schools, Ingersoll (1996) examined relationships between teacher control and influence over consequential school activities and organizational conflict. The analysis suggested that increases in both faculty influence over SWZ policy matters and teacher CRZ discretion and control were

associated with decreases in teacher-teacher, teacher-administrator, and teacher-student conflict.

Going farther than benchmark I (B1) which posits discretion as but an indicator of autonomy, Ingersoll suggests that "Teacher decision making power is autonomy…" (p. 165). Ingersoll used SASS items to capture two kinds of teacher discretion, the faculty's collective influence over school policy (i.e., schoolwide zone (SWZ)), and the decision making control of individual teachers in the classroom (i.e., classroom zone (CRZ)).

Each of the eight 1987-1988 SASS items utilized by Ingersoll satisfied B1 because they imply discretion over specific consequential school activities and explicitly include the keywords control or influence (Gwaltney, 2012a). In addition, all of the items were easily categorized in the B2 framework (see Table 3A2). Five of the items were categorized under Factor I: Student Teaching and Assessment, CRZ. One item used to capture the sorting function of schools: Setting policy on grouping students into classes by ability, is most like the Friedman (1999) item: Teachers decide on student demographic class-composition policy. Therefore, the item is classified under B2 Factor II: School Mode of Operating, SWZ. Two of the items were identical to the 1999-2000 SASS items used in the Liu (2007) inquiry so they were classified as they were previously.

A Comprehensive Set of Potential SASS Autonomy Indicators

The National Center for Education Statistics (NCES) conducts SASS on a nationally representative sample hierarchically organized by state, city, district, sector, and school level. While the NCES has collected data during 1987-88, 1990-91, 1993-94, 1999-00, 2003-04, and 2007-08, of particular interest to this inquiry were survey items

contained in the SASS 1999-2000 and 2003 -2004 Teacher Questionnaires (TQ00 and TQ04 respectively). TQ00 and TQ04 were selected because they: (a) Contain nearly identical items. (b) Span a period of time that is significant in U.S. educational policy history (i.e., before NCLB enactment and the first few years after implementation). (c) Include separate but connected questionnaires for teachers who left the profession the following year. Those attributes and others promise rich opportunities for future inquiry regarding relationships between policy and teacher autonomy as well as teacher autonomy and attrition. Data from the SASS 2007-2008 Teacher Questionnaire would have been analyzed as well but unfortunately, several of the items were discontinued for that that iteration.

Each of the four Appendix 3B tables (3B1-3B4) is organized around a single B2 factor and lists the indicators of the Category I and II inquiries that are theorized to indicate the table's factor. Appendix 3B is intended to highlight the similarities between the customized Category I indicators and SASS items used in Category II studies. For example, in Table 3B1 the 1987-1988 SASS item: Selecting textbooks and other instructional materials, is very similar to the Friedman (1999) indicator: Teachers select teaching materials from a known inventory, as well as the Pearson and Hall (1993) indicator: The materials I use in my class are chosen for the most part by me.

Appendix 3B suggests that SASS items are indeed very similar to Category I indicators and moreover that SASS items exist which can potentially indicate each of the four benchmark II factors. Therefore, it was hypothesized that the 1999-2000 and 2003-2004 SASS Teacher Questionnaires contain potential indicators of teacher autonomy.

Three methods were used to harvest items from TQ00 and TQ04 to create a comprehensive set of teacher autonomy indicators. First, all of the Appendix 3B SASS items were included because they were shown to favorably compare to benchmark I (B1) and benchmark II (B2). Second, the SASS Electronic Code Book (ECB) was used to extract items that the NCES stipulates pertain to teacher autonomy by typing "autonomy" into an ECB keyword search. Third, all of the items of the TQ00 and TQ04 were individually examined by the researcher to identify any additional items that met the B1 and B2 criterion. Finally, for an item to be included it had to exist in both the TQ00 and TQ04.

Table 1 contains each of the 17 items harvested using the methods just described and its B2 classification. Each of the potential indicators: (a) imply or explicitly contain the autonomy indicators control, discretion, and influence (Gwaltney, 2012a), (b) were previously used in studies (e.g., Ingersoll, 1996; Liu, 2007) to describe autonomy or closely related concepts, and (c) were successfully assigned to a B2 factor.

All Table 1 items are Likert type, four or five point scales depending on survey section and iteration. TQ00 items are scaled as either 1 - 5 or 1 - 4 depending on the section of the survey. TQ04 autonomy items employ only 1 – 4 scales. One corresponds to No influence and five indicates A great deal of influence for the TQ00 five point items (i.e., 57a – g). The neutral response, 3 is eliminated in the corresponding TQ04 items (i.e., 61a - g) and instead of 5, 4 corresponds to A great deal of influence. Unfortunately, the AMOS computer program does not accommodate Likert scale differences, so direct statistical comparisons between the TQ00 and TQ04 data sets were not considered.

Table 1

Potential SASS 1999-2000, 2003-2004 SASS-STA Autonomy Indicators

POTENTIAL SASS-STA ITEM	1999-2000 Item #	2003-2004 Item #	Friedman (1999) Factor	SWZ/CRZ Indicator
RESOURCES AND ASSESSMENT OF STUDENTS	SECTION V	SECTION VI		
To what extent do you use the information from your students' test scores --	47a	55		
1. To group students into different instructional groups by achievement or ability	47b1	55a	I	CRZ
2. To assess areas where you need to strengthen your content knowledge or teaching practice?	47b2	55b	III	CRZ
3. To adjust your curriculum in areas where your students encountered problems?	47b3	55c	IV	CRZ
DECISION MAKING/TEACHER ATTITUDES AND SCHOOL CLIMATE:	SECTION VII	SEC. VIII &IX		
How much actual influence do you think teachers have over school policy in each of the following areas?	57	61		
4. Setting performance standards for students of this school	57a	61a	II	SWZ
5. Establishing curriculum	57b	61b	IV	SWZ
6. Determining the content of professional development programs	57c	61c	III	SWZ
7. Evaluating teachers	57d	61d	III	SWZ
8. Hiring new full- time teachers	57e	61e	III	SWZ
9. Setting discipline policy	57f	61f	II	SWZ
10. Deciding how the school budget will be spent	57g	61g	II	SWZ
How much control do you think you have IN YOUR CLASSROOM over each of the following areas of your planning and teaching?	58	62		
11. Selecting textbooks and other instructional materials	58a	62a	I	CRZ
12. Selecting content, topics, and skills to be taught	58b	62b	I	CRZ
13. Selecting teaching techniques	58c	62c	I	CRZ
14. Evaluating and grading students	58d	62d	I	CRZ
15. Disciplining students	58e	62e	I	CRZ
16. Determining the amount of homework to be assigned	58f	62f	I	CRZ
To what extent do you agree or disagree with each of the following statements?	59	63		
17. I make a conscious effort to coordinate the content of my courses with that of other teachers	59r	63r	II	SWZ

Construct Validity of the SASS-STA

Purpose

There were several reasons for the study: (a) to ascertain if first-order factor(s) underlie the items of Table 1 and if so, would those factors resemble the teacher autonomy factors found in the literature, (b) explore whether a second-order teacher autonomy factor underlies the first-order factors established in (a), (c) to provide empirical evidence for the reliability and validity of the SASS-STA to measure teacher-perceived work autonomy by evaluating fit to the primary sample (i.e., TQ00) and to the secondary sample (i.e., TQ04), and (d) to establish model generalizability by exploring autonomy perception measurement variance with regard to public or private employment and grade level most often taught; or invariance with regard to gender, age, teaching experience, and degree held.

It was hypothesized that teacher autonomy would not generalize across grade level most often taught or sector because Pearson and Hall (1993) and Kreis and Young Brockopp (2001) found autonomy levels differed among teachers who taught at different grade levels and by whether they taught in public or private school. On the other hand, it was hypothesized that teacher autonomy levels would generalize across level of education attained (degree), experience, age, and gender in accordance with the findings of Pearson and Hall (1993) and Pearson and Moomaw (2005).

Exploratory factor analysis (EFA), structural equation modeling confirmatory factor analysis (SEM CFA), SEM multiple group analysis, and SEM validity generalization procedures were utilized to:

1. Extract factors from the Appendix 3B items.

2. Confirm theoretical measurement models comprised of factors established during the EFA phase thereby validating the results of the EFA.
3. Establish that teacher autonomy can be modeled by a second-order factor indicated by the first-order factors established in 1 and 2 above.
4. Demonstrate that the model will generalize across appropriate teacher groups.

Sample

The principal sample (TQ00) sample included the perceptions of 52,404 public and private school employees. The TQ04 contained 51,847 and served as the secondary sample for cross-validation (Mosier, 1951). Other divisions within both samples (e.g., gender, grade level, highest degree held, teaching experience, and private or public employment sample) were used for validity generalization purposes (Mosier, 1951).

Survey items included in the TQ00 and TQ04 provided for demographic and group identification using descriptors such as Regular full-time teacher, Part-time teacher, Support staff, and Administrator. However, because it is logical to believe that those categorized as something other than Regular full-time teachers will have differing stakes and roles in school organizations, it was assumed that they would also have differing needs for, and levels of autonomy. Thus, only the perceptions of those categorized as Regular full-time teachers were used for analysis because the goal of the inquiry was to establish an autonomy construct for career teachers. After those that described themselves as anything other than regular full-time teachers were filtered out, the TQ00 and TQ04 contained 46,877 and 46,305 regular full-time public (including public charter and Bureau of Indian Affairs) and private school teachers respectively. Table 2 details the demographic breakdown of the TQ00 and TQ04 data sets.

Table 2

SASS 1999-2000, 2003-2004 Demographics/Characteristics

Demographic/ Characteristic	SASS 1999-2000 N = 46,877	SASS 2003-2004 N = 46,305
Men	15,115 (32%)	14,429 (31%)
Women	31,762 (68%)	31,876 (69%)
Union	29,334 (63%)	29,172 (63%)
Non-Union	17,543 (37%)	17,133 (37%)
Public	41,179 (88%)	39,918 (86%)
Private	5,698 (12%)	6,387 (14%)
Elementary	18,260 (39%)	14,614 (32%) 5,989 (13%) elementary/secondary.
Middle	23,632 (50%)	20, 516 (44%)
High	4,985 (11%)	5,186 (11%)
White	39,383 (84%)	40,767 (85%)
Black	2,894 (6%)	3,039 (6%)
Hispanic	2,145 (5%)	1,738 (3%)
Native American -- Asian/Pacific Islander	2,455 (5%)	3,094 (6%)
30 or Under	9,614 (21%)	8,826 (19%)
31 to 50	25,729 (55%)	23,373 (51%)
50 or Older	11,534 (24%)	14,106 (30%)
No Bachelor's	722 (2%)	1,240 (3%)
Bachelor's Degree	46,155 (99%)	45,065 (97%)
Master's Degree	19,375 (41%)	19,416 (42%)
Terminal Degree	1,769 (4%)	2,171 or (5%)

Instrumentation/Procedure

The instrument for the study was Table 1. The majority of Table 1 items asked participants to indicate the amount of influence or control they had over issues ranging from None to A great deal. However, Item 17 (59r in the TQ00 and its mirror image item 63r in the TQ04): I make a conscious effort to coordinate the content of my courses with that of other teachers, in comparison to those just described, was negatively rated ranging from Strongly agree to Strongly disagree. Item 17 was reverse coded to match the ascending format of the other potential indicators.

Overview of Statistical Analyses

Descriptive statistics, including means, standard deviations, and item-total correlations, were computed for each item remaining after the initial screening of the original 17 items. All statistical assumptions were checked using SPSS routines to conduct linearity, normality, outlier, and multicollinearity examinations prior to the exploratory factor analysis (EFA).

TQ00 items were then subjected to EFA and factors were extracted by applying an iterative procedure. Indicator strength was gauged by item-total correlations and factor acceptance was based on internal consistency reliability as measured by Cronbach's alpha coefficient. In addition, Kaiser's eigenvalue rule (Nunnally, 1978), Cattell's (1966) scree test, and a comparison of observed correlation matrix and reproduced correlation matrix was verified by examining the residual correlation matrix. The factor structure coefficient saliency criterion was predetermined to be 0.30. Internal consistency of the scores on the SASS-STA scale and its subscales was estimated by Cronbach's coefficient alpha.

Separate EFA and CFA were executed for each of the two samples and the results were compared. Background variables, such as public or private employment, gender, age, teaching experience, highest degree held, and grade level most often taught were only compared within the TQ00 and the TQ04 samples and not between samples because of the Likert scale incongruity between SASS iterations. The Pearson product-moment correlation coefficient r was used to compare magnitude of factor structure coefficients. SEM cross-validation and validity generalization procedures were applied to the TQ00 and the TQ04 and subgroups within samples were examined for validity generalization

purposes. First-order factors were then assessed in accordance with three theory supported SEM CFA measurement models. After a model was identified and perfected, within TQ00 and TQ04 measurement invariance was investigated using the previously mentioned background variables in SEM multiple group analysis.

Results

Initial Screening/Examination of Items

At the outset of the analysis, three potentially important teacher discretion indicators (i.e., Table 1 items 1, 2, and 3 were eliminated from the analysis. Those items were eliminated because nearly half of the teachers in both samples indicated they did not receive state or district student achievement scores and as a result were directed to skip the items. Clearly, those who did not answer the items represented a rather substantial subsection of both samples including, for example, some instructors of art, industrial arts, math, music, preschool, and physics in both public and private schools. So to include the perceptions of the widest variety of regular full-time teachers, the analysis proceeded using the remaining 14 items that were answered by all in both samples. While losing the three items was unfortunate, the loss of item one was particularly disappointing because it was the only item that spoke directly to the sorting of students by ability -- or the societal stratification function that teachers perform in schools -- one of the most consequential and important activities performed by teachers (Ingersoll, 1996).

Linearity, normality, outlier, and multicollinearity assumptions were examined using the SPSS explore routine. Histograms and stem and leaf plots indicated reasonable univariate normality for most of the items in accordance with generous acceptance guidelines (i.e., +2 to -2 for skew, and +3 to -3 for kurtosis when the data are normally

distributed (Garson, 2012)). According to those criterions, none of the remaining 14 items were found to be unacceptably skewed. However three items (i.e., 13, 14, and 16 of Table 1) in both samples were found to have values that fell outside the kurtosis limits. However, because those items represented classroom zone (CRZ) aspects over which teachers have traditionally enjoyed a great deal of control (e.g., selecting teaching techniques, evaluating and grading students, and determining the amount of homework to be assigned) they were assumed reliable and were not subjected to normalization procedures.

Bivariate scatterplots between several of the remaining items revealed linear relationships, and finally, because Likert scales were used to score the 14 potential indicators, no severe univariate or multivariate outliers were perceived to exist. Multicollinearity was not a considered a threat because an inspection of the squared multiple correlations revealed correlations between the items ranging from .03 to .48 for the TQ00, and from .03 to .45 for the TQ04.

Reliability

Because the NCES employs an imputation procedure to address missing data in the SASS, coefficients for reliability were determined on all 46,877 and 46,305 available cases in the TQ00 and TQ04 respectively with none missing. SPSS's Cronbach's alpha coefficient program was used to compute estimates of internal consistency reliability for the remaining 14 items. For the TQ00 and TQ04, reliability was estimated to be .82 and .81 respectively. However item 17, I make a conscious effort to coordinate the content of my courses with that of other teachers, had poor item-total correlations in both samples (i.e. PS, r = .03; SS, r = .03) and was therefore eliminated from further analysis.

Table 3

Item Total Correlation of Refined 13 item instrument comprised of SASS 1999-2000 (PS), 2003-2004 (SS) SASS-STA Autonomy Indicators

Item	r^{PS}	r^{SS}
How much actual influence do you think teachers have over school policy in each of the following areas?		
1. Setting performance standards for students of this school	.58	.55
2. Establishing curriculum	.61	.61
3. Determining the content of professional development programs	.50	.50
4. Evaluating teachers	.46	.46
5. Hiring new full- time teachers	.44	.43
6. Setting discipline policy	.57	.54
7. Deciding how the school budget will be spent	.41	.42
How much control do you think you have IN YOUR CLASSROOM over each of the following areas of your planning and teaching?		
8. Selecting textbooks and other instructional materials	.46	.46
9. Selecting content, topics, and skills to be taught	.47	.49
10. Selecting teaching techniques	.44	.44
11. Evaluating and grading students	.40	.39
12. Disciplining students	.41	.39
13. Determining the amount of homework to be assigned	.32	.32

^{PS} TQ00 Primary Sample, ^{SS} TQ04 Secondary Sample.

The 13-item scale had an internal consistency coefficient of .83 in the TQ00 and .82 in the TQ04. The potential indicators and their item-total correlations for the samples are summarized in Table 3. As the table indicates, all 13 items had adequate item-total correlation, with none under .32. Remarkably, the largest difference between any two TQ00 and TQ04 item-total correlation measures was .03; a testament to similarity of the SASS 1999-2000 and SASS 2003-2004 teacher samples.

Factor Analysis

The correlation matrix was computed (see Table 4) and scanned to examine the pattern of relationships between the 13 items of the TQ00 and TQ04 samples. Singularity was not a problem because no significance values were observed to be greater than .05. Moreover, no correlations were observed to remotely approach .90 with the highest at .61 in both samples. The possibility of multicollinearity was then considered by examining the determinant of the correlation matrices. For the both samples, the determinant was .02, much greater than the necessary value of 0.00001, therefore, multicollinearity was ruled out (Garson, 2012). In sum, the 13 items correlated fairly well and none of the correlation coefficients were particularly large in either sample. As a result, no further items were eliminated from the analysis.

Sampling adequacy was considered excellent according to Garson (2012) because the Kaiser-Meyer-Olkin (KMO) statistics (.86 and .85 for the TQ00 and TQ04 respectively) were between 0.8 and 0.9. Additionally, because Bartlett's Test of Sphericity (BTS) was significant, it was determined that there were indeed correlational relationships between the items. Overall, considering the KMO and BTS statistics as well as that the items of the 13-item scale showed reasonable item-total correlations (none under .32 in either sample) and that an initial cluster analysis showed distinct groupings; exploratory factor analysis (EFA) was deemed appropriate for the data sets. In line with Friedman (1999), it was hypothesized that an optimal solution would involve four factors.

The number of factors extracted was tied to several metrics as well as to theory. Based on Kaiser's rule (Nunnally, 1978), an initial empirical estimate of the number of factors to extract was based on the size of the factor eigenvalues. Three factors had eigenvalues

Table 4

Primary and Secondary Sample Correlation and Descriptive Statistics

Variable (Table 1)	4	5	6	7	8	9	10	11	12	13	14	15	16
How much actual influence do you think teachers have over school policy in each of the following areas?													
4. Setting performance standards for students of this school	--												
5. Establishing curriculum	.60, .56	--											
6. Determining the content of professional development programs	.40, .39	.38, .38	--										
7. Evaluating teachers	.35, .35	.33, .32	.42, .42	--									
8. Hiring new full- time teachers	.29, .56	.30, .29	.33, .32	.45, .45	--								
9. Setting discipline policy	.46, .43	.38, .36	.44, .42	.40, .39	.43, .40	--							
10. Deciding how the school budget will be spent	.29, .56	.26, .25	.36, .36	.35, .37	.42, .43	.41, .41	--						
Variable (Table 1)	4	5	6	7	8	9	10	11	12	13	14	15	16
How much control do you think you have IN YOUR CLASSROOM over each of the following areas of your planning and teaching?													
11. Selecting textbooks and other instructional materials	.29, .26	.41, .41	.23, .21	.16, .15	.17, .16	.21, .19	.15, .15	--					
12. Selecting content, topics, and skills to be taught	.31, .29	.44, .45	.18, .18	.17, .17	.14, .13	.20, .19	.11, .13	.55, .57	--				
13. Selecting teaching techniques	.22, .21	.28, .28	.16, .16	.07, .07	.10, .10	.18, .17	.10, .11,	.36, .35	.47, .46	--			
14. Evaluating and grading students	.20, .18	.23, .23	.12, .13	.05, .05	.07, .07	.15, .14	.07, .08	.29, .28	.37, .36	.56, .55	--		
15. Disciplining students	.24, .22	.22, .21	.19, .18	.15, .11	.15, .13	.33, .30,	.14, .14	.20, .20	.26, .24	.37, .37	.40, .40	--	
16. Determining the amount of homework to be assigned	.15, .13	.18, .17	.10, .10	.04, .04	.06, .06	.12, .11	.07, .06	.24, .23	.30, .28	.43, .43	.48, .48	.35, .38	--
Variable (Table 1)	4	5	6	7	8	9	10	11	12	13	14	15	16
M_{ps}	3.17	3.40	2.89	1.89	2.03	2.82	2.03	3.65	3.73	4.43	4.50	3.97	4.50
M_{ss}	2.66	2.84	2.45	1.70	1.81	2.42	1.79	3.01	3.13	3.70	3.75	3.52	3.74
SD_{ps}	1.25	1.23	1.22	1.09	1.20	1.26	1.15	1.18	1.15	0.79	0.73	0.96	0.78
SD_{ss}	0.96	0.95	0.91	0.82	0.89	0.94	0.84	0.99	0.94	0.57	0.52	0.67	0.56

Note: The first coefficient in each set of two represents the correlations between the 13 1999-2000 SASS indicator items. The second represents correlations between the 13 2003-2004 SASS indicators. ps = Primary Sample (i.e., TQ00) ss = Secondary Sample (i.e., TQ04)

greater than 1, and a fourth was .82 and .84 in the TQ00 and TQ04 respectively. In addition, because benchmark II (B2) is based on the four factors of Friedman's Teacher Work-Autonomy Scale (TWA), and on the basis of Kaiser's rule, no more than four factors were extracted. Furthermore, no more than four factors were indicated because eigenvalues plotted against factors, also known as the scree test (Cattell, 1966), exhibited a distinct change in the direction of the lines crossing the eigenvalue plot points between the third and the fourth factors. Therefore, both three and four-factor solutions were calculated and residual correlation matrices were compared for each sample. Finally, because theory suggests a solution might indicate just two factors (i.e. classroom zone (CRZ) and schoolwide zone (SWZ) teacher autonomy) a two factor solution was specified and examined as well.

The four factor solution accounted for 63.8% and 63.5% of the variance in the 13 TQ00 and TQ04 items respectively. The three factor and two factor solutions accounted for 57.5% and 57.1% and 48.9% and 48.3% respectively. In the end, based on theory, examination of the residual correlation matrices, and total variance explained, the four factor conceptualization was selected as the solution that best represented both data sets.

Oblique and orthogonal rotations were calculated and considered. The oblique rotation (oblimin, delta = 0) revealed that Factor I had a correlation of r = -.17 with Factor III and of r = .24 with Factor II in the TQ00 (see Table 5). Varimax rotation, an orthogonal rotation of the factor axes that maximizes the variance of the squared loadings of a factor on all the variables, has the effect of differentiating the original variables by extracted factor so each factor will tend to have either large or small loadings of any particular variable. As a result, a varimax solution yields results which make it easily

possible to identify each variable with a single factor (Garson, 2012). The varimax rotation, as was expected, was more interpretable; however, both solutions indicated that the same items were highly correlated with the different factors but with very

Table 5

Correlation Coefficients among Factors of the Schools and Staffing Survey Scale for Teacher Autonomy (SASS-STA) for the 1999-2000 and 2003-2004 SASS Data Sets

Factor	I	II	III
I	—		
II	.24, .22	—	
III	-.17, -.19	-.28, -.29	—
IV	.44, .42	.14, .13	-.08, -.10

Note: The first correlation coefficient in each set of two represents the relationship between the factors extracted from the 1999-2000 SASS (TQ00). The second represents the correlation coefficient between factors extracted from the 2003-2004 SASS (TQ04).

similar magnitudes, so, the varimax rotation was chosen to represent the data in the final solution.

Factor loadings in excess of .71 (50% of variance) were categorized as excellent, .63 (40%) very good, .55 (30%) good, .45 (20%) fair, .32 (10%) poor, and below .32, no loading (Tabachnick & Fidell, 2001). Considering the preceding, the saliency criterion for item inclusion in the factor structure was predetermined to be .30. On that basis, no items were deleted due to low item-factor structure coefficients (less than .30) on any of the four factors extracted from either sample.

The subscales of the SASS-STA (see Table 6) were identified by subjecting the 13 SASS items to the factor analysis procedure described previously. Because it was hypothesized that the EFA would extract factors that were theoretically similar to those

found by Friedman (1999); the indicators of the four newly extracted factors were compared to the indicators and factors of Friedman's Teacher Work Autonomy Scale.

Comparison revealed that the indicators of Factor I (i.e., teacher classroom control over selecting teaching techniques, evaluating and grading students, disciplining students, determining the amount of homework to be assigned) were most similar to Friedman's Factor I -- Student Teaching and Assessment which is indicated by items that measure teacher discretion over the classroom in the areas of student attainment and evaluation, norms for student behavior, the physical environment, and teaching emphases on components of mandatory curriculum. Because the factors were found to share similar indicators that address teacher classroom control over student behavior and discipline, and selecting different teaching and evaluation techniques to address the mandatory curriculum; Factor I was named Classroom Control over Student Teaching and Assessment.

Factor II, hereafter called Schoolwide Influence over Organizational and Staff Development, was indicated by items that quantify collective faculty influence over evaluating teachers, hiring new full-time teachers, and deciding how the school budget will be appropriated. Factor II was considered most similar to the Friedman (1999) Factor III -- Staff Development because its indicators speak to the subjects, time schedule, and the procedures of teacher in-service training as part of the general school practice. While Factor II speaks to faculty's ability to shape the organization by selecting and evaluating colleagues, as well as directing its financial resources; the factor is not exactly a perfect match for the professional development emphasis of Friedman's Factor III. It is clear

Table 6

Rotated Principal Component Factor Matrix for the Schools and Staffing Survey Scale for *Teacher Autonomy (SASS-STA)*

Table 1		Factor			
Item Number	Item Content	I	II	III	IV
Factor I: Classroom Control over Student Teaching and Assessment					
How much control do you think you have IN YOUR CLASSROOM over each of the following areas of your planning and teaching?					
14. Evaluating and grading students		.77, .77			
16. Determining the amount of homework		.74, .75			
15. Disciplining students		.71, .72		$.31_a$	
13. Selecting teaching techniques		.67, .66	.43, .42		
Factor II: Schoolwide Influence over Organizational and Staff Development					
How much actual influence do you think teachers have over school policy in each of the following areas?					
8. Hiring new full- time teachers			.80, .81		
10. Deciding how the school budget spent			.77, .76		
7. Evaluating teachers			.65, .66		.32, .33
Factor III: Classroom Control over Curriculum Development					
How much control do you think you have IN YOUR CLASSROOM over each of the following areas of your planning and teaching?					
11. Selecting textbooks/instructional materials				.80, .81	
12. Selecting content, topics, and skills to be taught				.77, .80	
Factor IV: Schoolwide Influence over School Mode of Operation					
How much actual influence do you think teachers have over school policy in each of the following areas?					
4. Setting performance standards for students of this school					.82, .82
5. Establishing curriculum				.44, .48	.71, .67
9. Setting discipline policy			.52, .51		.55, .54
6. Determining the content of professional development programs			.47, .44		.52, .54

Note: The first coefficient in each set of two represents 1999-2000 SASS (TQ00) values. The second represents 2003-2004 SASS (TQ04). Extraction method: principal component analysis with varimax rotation and Kaiser normalization. Factor loadings of less than .30 are not shown. Subscript 'a' indicates TQ00 loading.

however that both factors suggest faculty power to influence the schoolwide organization by shaping faculty characteristics and directing the use of resources.

Factor III, which underlies two items that speak to teacher control over selecting textbooks and other instructional materials and to select content, topics, and skills to be taught in their classrooms was found to be most like Friedman's Factor IV -- Curriculum Development. Friedman's Curriculum Development factor is indicated by items that measure teacher power to introduce new homemade or imported curricula and to introduce major changes in the existing formal and informal curricula. The parallels between the indicators of the factors are clear. Teacher discretion to select textbooks and other instructional materials is arguably another way of saying that teachers have the power to introduce new curricula or change the existing formal and informal curricula. Therefore, Factor III was named Classroom Control over Curriculum Development.

The fourth factor was called Schoolwide Influence over School Mode of Operation because of its similarity to Friedman's Factor II -- School Mode of Operating. Factor IV was indicated by items that measure the faculty's collective influence over schoolwide policy governing student performance standards, curriculum, discipline, and the professional development of teachers. Those indicators are most similar to the indicators of Friedman's second factor which includes establishing school goals and vision, budget allocations, school pedagogic idiosyncrasy, and school policy regarding class composition and student admission.

By no means is it asserted that the newly extracted factors exactly mirror the factors found by Friedman (1999). However, it is suggested that the EFA did indeed extract identical factors from the TQ00 and TQ04 data sets that they reasonably resemble

those of Friedman's TWA. Because the factors were consistent across samples that differed considerably in terms of time (four years), policy environment (No Child Left Behind existed for TQ04 teachers but not for TQ00 teachers), and because they were consistent with the existing literature, this inquiry suggests that the newly extracted factors are psychometrically sound and display construct and external validity.

Internal Consistency

The scale scores for the four factors were measured by Cronbach's alpha to determine internal consistency. Cronbach's alpha, a measure of the extent to which items in a test have communalities, is the lower limit of the reliability of a set of test scores (Garson, 2012). The scores in the whole scale and four subscales for the TQ00 and TQ04 were .83, .74, .67, .71, and .76, and .82, .74, .68, .72, and .75 respectively. A Cronbach's alpha of .60 is considered acceptable for exploratory purposes, .70 considered adequate for confirmatory purposes, and .80 is considered good for confirmatory purposes (Garson, 2012). On that basis, the new construct's subscales were deemed to be internally consistent for both samples and it was named the Schools and Staffing Survey – Scale for Teacher Autonomy (SASS-STA).

Confirmatory Factor Analysis, Alternative Model Comparison, Model Perfection, and Cross Validation

Confirmatory Factor Analysis

While structural equation modeling (SEM) can be and typically is used to model causal relationships among latent variables (factors), it is equally possible to use SEM to explore CFA measurement models (Garson, 2012). This was the CFA approach used in this inquiry. Because the EFA provided strong empirical evidence to suspect that a four

factor model would best model teacher autonomy; SEM CFA routines were used to test three models in an attempt to replicate the four-factor structure originally derived in the previous EFA (Kline, 2005; Tabachnick & Fidell, 2001). In addition, because SEM CFA can probe for the possibility of higher-order factor relationships, the method was utilized to model a hypothesized second-order teacher autonomy factor suggested by the theoretical underpinning and the third research question.

Alternative Model Comparison

Model 1 (see Appendix 3C, Figure 3C1) specified four factors consistent with the four factors found in the EFA. To further test construct multidimensionality, an alternative model, Model 2 (see Appendix 3C, Figure 3C2), was tested which required that all 13 items load on a single factor. A third model, Model 3 (see Appendix 3C, Figure 3C3), was specified to explore the possibility that the four factors of Model 1 would indicate a second-order factor.

Model fit was assessed for each model using well-established, well known, and well used indices (i.e., comparative fit index (CFI), goodness of fit index (GFI), normed fit index (NFI), Tucker–Lewis index (TLI), root-mean-square error of approximation (RMSEA), standardized root mean square residual (SRMR), and chi-square test statistics) (Hu & Bentler, 1999). For the CFI, GFI, NFI, and TLI indices, values greater than .90 are typically considered acceptable, and values greater than .95 indicate good fit to the data (Hu & Bentler, 1999). For well-specified models, an SRMR of .09 or less and a RMSEA of .06 or less reflects a good fit (Hu & Bentler, 1999). Significant chi-square statistics means the model's covariance structure is significantly different from the observed covariance matrix, an indication of lack of satisfactory model fit (Kline, 2005). However,

non-significant chi-square matrix differences are a very conservative standard, especially when large sample sizes are involved (Garson, 2012). Therefore significant chi-square findings were disregarded when other fit indices supported acceptance.

Using SPSS Incorporated's PASW Statistics AMOS version18 and maximum-likelihood estimation, the CFA analysis tested the three models using the TQ00 sample.

Table 7

Model Testing using SASS 99-00 Data (PS)

Model	$\chi 2$	df	CFI	GFI	NFI	TLI	RMSEA	SRMR
Model 1	32,973.12	118	.91	.95	.91	.88	.06	.05
Model 2	136,763.42	130	.62	.75	.62	.55	.11	.12
Model 3	35,176.89	122	.90	.94	.90	.88	.06	.06

Note: Model 1 specified four primary factors with no correlations between error terms. Model 2 specified one single primary factor. Model 3 specified four primary factors and one second-order factor. CFI = comparative fit index; GFI = goodness of fit index; NFI = normed fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; and SRMR = standardized root mean squared residual. For the CFI, GFI, NFI, and TLI indices, values greater than .90 are considered acceptable, and values greater than .95 indicate good fit to the data (Hu & Bentler, 1999). For well-specified models, an SRMR of .09 or less and a RMSEA of .06 or less reflects a good fit (Hu & Bentler, 1999).

All three models were based on the 13 items derived earlier in the EFA. Fit indexes for each model are presented in Table 7. Model 1 specified the four factors found in the EFA, with none of the error terms allowed to correlate to promote model parsimony. All indicators had high correlations with their respective factors, and the model had acceptable fit to the data. The correlations among the four factors ranged between .09 and .56.

The independence or null model tested the hypothesis that all of the items in Model 1 were uncorrelated. That hypothesis, and the associated independence model was

rejected, $\chi 2$ (78, N = 46,877) = 184,511, $p < .0001$. Next Model 1 (see Figure 3C1) was compared to the null model ($\chi 2$ (59, N = 46,877) = 16,827, $p < .0001$) and because the chi-square difference test indicated significant improvement between the independence model and Model 1, and because the Model 1 fit indices were within acceptable standards, it was supported.

To test the prospect that teacher autonomy is not multidimensional, Model 2 tested the proposition that all 13 items loaded on a single first-order factor (see Figure 3C2). As evidenced by the fit indices, the data did not fit Model 2 well at all.

Finally, Model 3 (see Figure 3C3) was specified to test the proposition that the four first-order factors of Model 1 indicate a second-order factor. When this model was run, the variance of the disturbance term of Factor IV -- Schoolwide Influence over School Mode of Operation (i.e., e15 in Figure 3C3) was negative, a Heywood case that prevented AMOS from producing an admissible solution.

Potential Heywood case causes were investigated and because the sample size was more than adequate for the only two indicator factor (Factor III), outliers were non-existent due to the use of Likert scales, and the model was well specified, the negative variance of the disturbance term was attributed to a combination of bad maximum likelihood iteration start values and large sample size. One approach to remedying a small negative disturbance term variance is to simply assign a small positive variance value (Garson, 2012) so, disturbance term e15 was assigned a variance value of .001 and Model 3 was rerun.

The fit indices, without providing any covariance paths (double-headed curved arrows) between indicator error terms or factor disturbance terms, were not particularly

strong (CFI, GFI, NFI, TLI, RMSEA, SRMR were .86, .92, .86, .83, .09, .08 respectively). However, an inspection of the AMOS provided modification indices suggested that providing a single covariance path between the disturbance terms of Factor I -- Classroom Control over Student Teaching and Assessment, and Factor III -- Classroom Control over Curriculum Development, would reduce overall model chi-square quite significantly. Providing the path was theoretically justified because allowing the path suggested a correlation between the disturbance terms of Factor I and Factor III that are not fully accounted for in the individual factor disturbance terms. After the covariance path was provided, Model 3 had acceptable fit to the data (CFI = .90, GFI = .94, NFI = .90, TLI = .88, RMSEA = .06, SRMR = .06) and significant relationships were observed between the four primary factors and the second-order factor hypothesized to represent teacher autonomy.

A chi-square difference test between Model 1 and Model 3 proved to be significant; an indication that the more complicated and less parsimonious model (i.e., Model 3) fit the data better (Garson, 2012; Kline, 2005). So, as was hypothesized, the SEM CFA model testing suggested that teacher autonomy is indeed multidimensional and can be posited as a second-order latent construct.

Model Perfection

AMOS provides modification indexes (MI) which suggest providing particular relationships between particular terms to reduce model chi-square and thereby improve fit indices -- albeit at the expense of model parsimony. MIs that suggested permitting indicators to load on multiple factors (cross loading) were not enacted to preserve factor

clarity and model parsimony. However, covariance paths between error terms were added if they made theoretical and statistical sense.

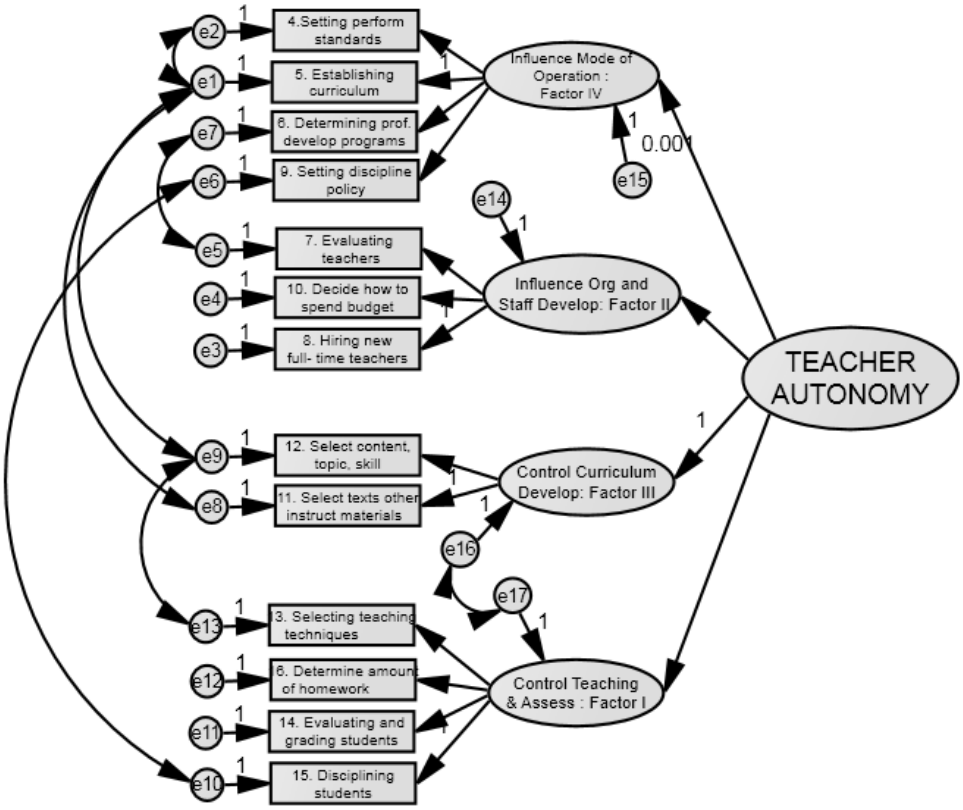


Figure 3. Final second-order Schools and Staffing Survey – Scale for Teacher Autonomy (SASS-STA) model

Six covariance paths were added that significantly reduced model chi-square. Modification of the model ceased when a majority of fit indices met or exceeded the thresholds for good fit. In the end, the fit indices for Model 3 were: $\chi 2$ (55, N = 46,877) = 7,211, $p < .0001$, CFI = .96, GFI = .98, NFI = .96, TLI = .95, RMSEA = .05, SRMR = .04. The final SASS-STA model is shown in Figure 5.

The SASS-STA solutions for the TQ00 and TQ04 are depicted in Figure 4 and Figure 5 respectively. The figures show the standardized regression coefficients

(loadings) that represent the paths from the first-order factors to the indicators as well as from the second-order teacher autonomy factor to the four first-order factors. All items loaded significantly at the $p < .001$ level.

An important finding was that the schoolwide zone or policy influence factors (i.e., Factor II: Schoolwide Influence over Organizational and Staff Development, and Factor IV: Schoolwide Influence over School Mode of Operation) had nearly twice the effect of the highest classroom zone factor. That result reinforced the findings of Ingersoll (1996) and Liu (2007) who found that when teachers have more influence over schoolwide policy matters, their organizations and their professional lives are positively impacted. The finding has substantial potential to inform school leadership because while teachers expect autonomy in the classroom zone, and believe control over policy matters is more appropriately an administrative function (Kreis & Young Brockopp, 2001); it is clear that administrators can more easily improve teacher perceptions of workplace autonomy by creating opportunities for teachers to participate in formulating schoolwide policy.

Cross Validation

SEM multiple group analysis was used for cross-validation (i.e., comparing the final model calibration/development sample (TQ00) with a model validation sample (TQ04)) as well as to compare interesting subgroups within each sample (e.g., public or private employment, grade level most often taught, gender, age, teaching experience, highest degree held) to explore measurement variance/invariance across groups. Before testing for group generalization, the final model was checked for TQ00, TQ04, and pooled TQ00 and TQ04 fit.

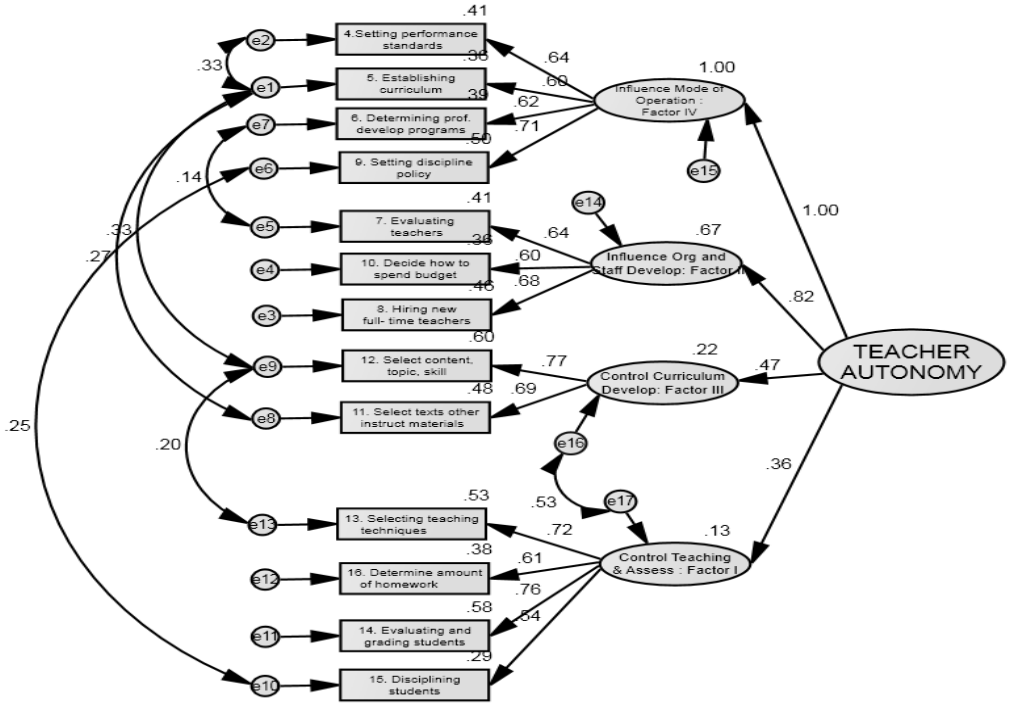


Figure 4. SASS 1999-2000 (TQ00) standardized estimates

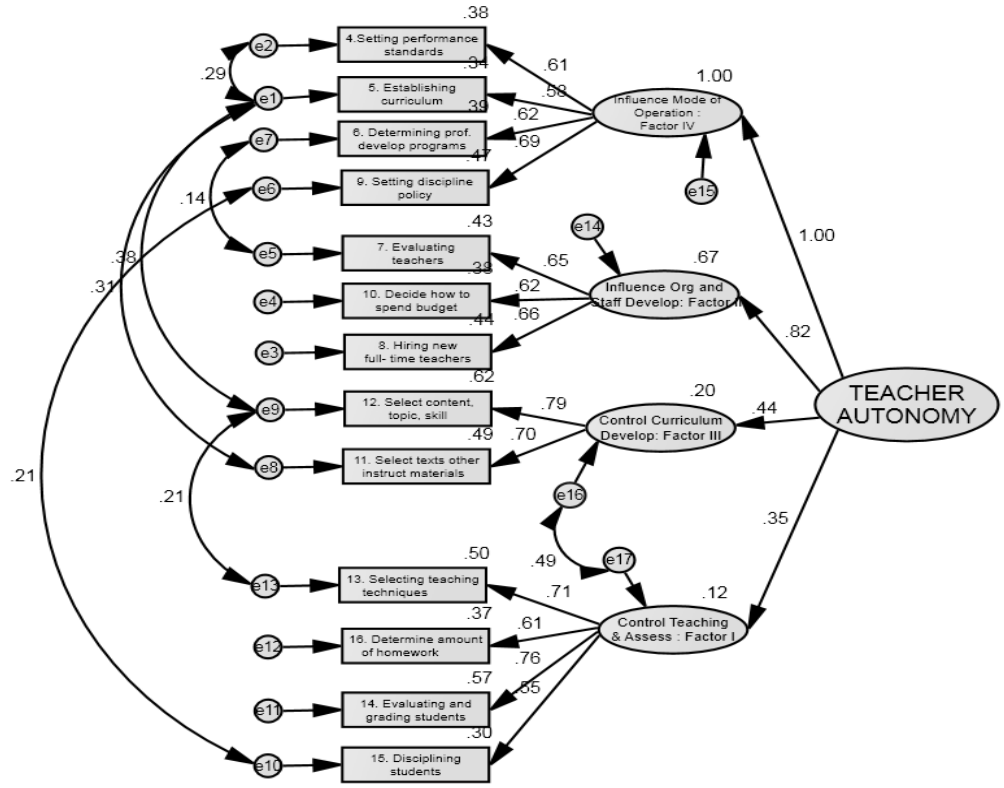


Figure 5. SASS 2003-2004 (TQ04) standardized estimates

Earlier, it was mentioned that the use of four-point Likert scales for TQ04 items and five-point Likert scales for the identical TQ00 items poses between group comparison issues because SEM usually focuses on the analysis of covariance. Unfortunately, unlike programs (e.g., M-Plus) which offer ways to address those kinds of problems, AMOS version 18 does not seem to offer a maximum likelihood estimation remedy.

Table 8

Multiple Group Model Testing using SASS 99-00(TQ00) and SASS 03-04 (TQ04) Data

Sample	$\chi 2$	df	CFI	GFI	NFI	TLI	RMSEA	SRMR
TQ00-TQ04 Pooled	14,387	110	.96	.98	.96	.94	.04	.04
TQ00	7,211	55	.96	.98	.96	.95	.05	.04
TQ04	7,176	55	.96	.98	.96	.94	.05	.04

Note. TQ00 = Primary Sample (SASS 99-00), TQ04 = Secondary Sample (SASS 03-04). CFI = comparative fit index; GFI = goodness of fit index; NFI = normed fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; and SRMR = standardized root mean squared residual. For the CFI, GFI, NFI, and TLI indices, values greater than .90 are considered acceptable, and values greater than .95 indicate good fit to the data (Hu & Bentler, 1999). For well-specified models, an SRMR of .09 or less and a RMSEA of .06 or less reflects a good fit (Hu & Bentler, 1999).

Therefore, direct statistical comparisons between the data sets were not conducted. However, fit indices indicated the model had good fit to each separate sample and to a pooled sample (see Table 8). In addition, separate regression parameter estimates for each of the samples were significant ($p < .001$) (see Figures 4 and 5). Because analysis indicated good model fit to an entirely new data set (i.e., TQ04) theorized to differ in terms of time (4 years), population (the vast majority of the teachers surveyed by the 2003-2004 SASS were not surveyed by the 1999-2000 SASS), and policy (NCLB was not in effect for the TQ00 sample) the SASS-STA was cross-validated.

Measurement Invariance

To determine if the SASS-STA model could be applied across groups, tests for measurement invariance were conducted. While the model fit results indicated that the model was indeed plausible for each of the samples, a welcome result was that the pooled sample fit indices signaled good fit as well (see Table 8). Even so, considering the mismatch of Likert measurement scales, at the outset of the TQ00 – TQ04 measurement invariance analysis, it was hypothesized that measurement variance would be found.

TQ00 – TQ04 measurement invariance testing proceeded by testing the unconstrained SASS-STA model for the combined samples; then factor loadings and structural relations (straight, single-headed arrows) among the latent variables were constrained to be equal between the data sets (Garson, 2012; Kline, 2005). As expected, the chi-square difference statistic revealed significant difference between the original and the constrained-equal models. Therefore; lack of measurement invariance between the TQ00 and TQ04 samples was confirmed. While the lack of measurement invariance may have been due to covariance issues caused by the mismatch of Likert scales, the finding may also have signaled interpretational confounding.

Interpretational confounding occurs when the weights used to induce the meaning of factors differ substantially across groups or across time, even while the same factor labels are retained (Garson, 2012). Interpretational confounding was considered to be a distinct possibility due to the substantial amount of time between SASS iterations and because of the major policy change that could cause the meaning of the SASS-STA factors to differ significantly across the samples. Because measurement variance was

found between the samples; group comparisons were thereafter limited to within sample groups.

To confirm model result consistency, within TQ00 and TQ04 measurement invariance testing focused on teacher demographics and groupings that previous inquires have suggested do not differ in autonomy levels (e.g., gender, age, teaching experience, highest degree held). While difference in a single parameter (i.e., autonomy) between particular groups does not confirm overall model measurement invariance, because measurement invariance analysis for previous teacher autonomy constructs has either not been conducted or not been reported, examining groups that were found to be statistically equal in autonomy levels was the next best precedent for a beginning. Conversely, testing also focused on teacher groupings previously found to differ in overall levels of autonomy (e.g., public or private employment, and grade level most often taught) to determine consistency of result.

Pearson and Hall (1993), and later Pearson and Moomaw (2006) using samples of public school teachers in Florida, found no significant difference between men and women on total autonomy score. In addition, when total autonomy scores were analyzed based on teacher age, years of teaching experience, and degree held, the differences were insignificant. On the other hand, Pearson and Hall (1993) and Pearson and Moomaw (2006) found significant autonomy score differences among teachers depending on grade level taught and Kreis and Young Brockopp (2001) found that parochial teachers perceived themselves to be more autonomous than did public school teachers.

Table 9

Teacher Group Measurement Invariance Testing within the SASS 1999-2000 Data

Subgroup	N1	N2	$\chi 2$ difference	p	Invariance
Male – Female					
Total Population	15,115	31,762	56.91	**	No
New Public <= 3 years	2,048	3,957	13.36	$.147_{SW}$	Yes
Veteran Public > 3 years	10,838	21,532	56.82	**	No
New Private <= 3 years	363	1,046	10.02	.349sw	Yes
Veteran Private > 3 years	1,110	3,179	24.396	*	No
Age					
20-30 and 31-40	9,609	10,368	17.68	*	No
31-40 and 41-50	10,368	15,361	15.15	.087sw	Yes
41-50 and 51-60	15,361	10,461	15.04	.090	Yes
51-60 and 61-70	10,461	987	16.63	.055sw	Yes
Highest Degree Bachelors – Masters and Higher					
Total Population	26,393	19,781	45.10	***	No
Public	20,976	19,781	17,032	**	No
Private	3,532	1,911	36.09	**	No
New <= 3 years	6,781	1,632	10.34	.280sw	Yes
Veteran > 3 years	19,612	18,149	37.08	***	No
Private Male	781	657	25.51	*	No
Private Female	2,751	1,254	24.83	*	No
Public Male	6,853	5,765	36.46	**	No
Public Female	14,123	19,781	58.25	**	No
New - Veteran					
Total Population	8, 643	38, 234	72.06	**	No
Public	6,005	32,370	101.75	**	No
Private	1,409	4,289	11.82	.224sw	Yes
Elementary – Secondary					
Total Population	18,260	23,632	55.99	**	No
Public	13,659	21,629	55.58	**	No
Private	3,752	1,337	57.63	**	No

Degrees of freedom for chi-square difference tests = 9. * = p < .05, ** = p < .01, *** = p < .001

Note. Chi-square difference statistics refer to the difference between the unconstrained model and the constrained equal model for measurement weights or the regression weights or the paths from the latent variables to their respective indicator variables. SW indicates invariance was also found among structural weights or the regression weights for the paths from one latent variable to another.

Table 10

Teacher Group SASS-STA Measurement Invariance Testing within the SASS 2003-2004 Data

Subgroup	N1	N2	$\chi 2$ difference	p	Invariance
Male – Female					
Total Population	14,429	31,876	60.85	**	No
New Public <= 3 years	1,978	4,015	2.62	.978sw	Yes
Veteran Public > 3 years	10,860	22,480	84.64	**	No
New Private <= 3 years	414	1,247	12.92	.349sw	Yes
Veteran Private > 3 years	1,013	3,713	15.81	.07	Yes
Age					
20-30 and 31-40	8,788	10,875	22.01	*	No
31-40 and 41-50	10,875	12,498	31.30	**	No
41-50 and 51-60	12,498	12,477	29.30	***	No
51-60 and 61-70	12,477	1,544	22.84	**	No
Highest Degree Bachelors – Masters and Higher					
Total Population	20,036	19,809	33.55	**	No
Public	16,492	17,761	29.99	**	No
Private	3,281	1,846	33.06	**	No
New <= 3 years	4,588	1,576	17.05	*	No
Veteran > 3 years	15,488	18,233	22.78	*	No
Private Male	665	556	20.28	*	No
Private Female	2,616	1,290	23.88	***	No
Public Male	5,190	5,784	17.96	*	No
Public Female	11,302	11,977	19.02	*	No
New - Veteran					
Total Population	8, 643	38, 234	72.06	**	No
Public	5,993	33,340	75.65	***	No
Private	1,661	4,726	22.84	*	No
Elementary – Secondary					
Total Population					
Public	5,993	33,340	75.65	***	No
Private	3,752	1,045	103.06	**	No

Degrees of freedom for chi-square difference tests = 9. * = p < .05, ** = p < .01, *** = p < .001

Note. Chi-square difference statistics refer to the difference between the unconstrained model and the constrained equal model for measurement weights or the regression weights or the paths from the latent variables to their respective indicator variables. SW indicates invariance was found among structural weights or the regression weights for the paths from one latent variable to another.

SASS-STA multiple group analysis failed to find general measurement invariance when either the entire TQ00 or TQ04 sample was examined with regard to gender, age, highest degree held (bachelors degree vs. masters degree and higher), teaching experience (new (three years or less) vs. veteran (more than three years)) grade level most often taught (elementary vs. secondary) (see Tables 9 and 10). That was not a particularly surprising result considering that the SASS data sets were much larger and much less homogeneous than the sets analyzed in previous inquiries. However, the analysis *did* find measurement invariance when the criteria for group membership were significantly narrowed.

For example, measurement invariance was non-existent between males and females when the entire TQ00 or TQ04 was examined; however, invariance was found when new male and new female teachers (those who had taught three years of less) were examined in both the private and public sectors. That finding was unique in that it was the only grouping for which measurement invariance was found in both the TQ00 and TQ04 samples.

Pearson and Hall (1993), and Pearson and Moomaw (2006) found no significant difference between teachers' autonomy scores based on age, teaching experience, or degree held. SASS-STA TQ00 analysis found measurement invariance among: (a) most of the age groups compared but not for teachers between 20 and 30 and those aged 31 to 40, (b) new teachers who held bachelors degrees and new teachers who held masters or higher degrees, (c) new and veteran private school teachers. Importantly, none of the TQ00 findings just discussed was observed in the TQ04 samples -- further support for the

contention that interpretational confounding may have occurred between the SASS iterations.

Overall, the analysis did not establish anything approaching general SASS-STA measurement invariance with regard to gender, age, highest degree held, or teaching experience, however measurement invariance was found for new male and female teachers in both the TQ00 and TQ04 samples, most age ranges in the TQ00, degree held in the TQ00, and TQ00 teaching experience in private schools. In addition, the analysis found, as was hinted at by the autonomy difference investigations of Pearson and Hall (1993) and Pearson and Moomaw (2006), measurement variance among teachers depending on grade level taught as well between public and parochial teachers as was suggested by Kreis and Young Brockopp (2001).

It is believed that the SASS-STA multiple group analysis was the first performed on a teacher autonomy construct and overall, the consistency of findings between certain teacher groups established the reliability and validity of the model (Kline, 2005). It is important to note however that the testing was not intended to identify specific model parameter differences between any of the groups examined. Parameter differences, and in particular, group autonomy level differences, are interesting and important questions for future research.

Discussion

This article has established the Schools and Staffing Survey – Scale for Teacher Autonomy (SASS-STA) and provided evidence to support its validity and reliability. Valid constructs are based on theories which are underpinned by clear operational definitions involving measurable indicators (Garson, 2012). Both were shown to be true

of the SASS-STA. The inquiry hypothesized that: (a) exploratory factor analysis (EFA) would establish factors that would resemble the teacher autonomy factors found in the literature, (b) SEM CFA measurement models comprised of factors extracted in (a) would validate the results of the EFA, (c) teacher autonomy would be best modeled by a second-order factor structure, and (d) the model would generalize across appropriate teacher groups. All were realized in whole or in part.

The four first-order SASS-STA factors that emerged from the EFA, and later validated by SEM CFA, were shown to be similar to the first-order factors of Category I studies (e.g., Friedman (1999), Pearson and Hall (1993)). Furthermore, model testing confirmed that teacher autonomy can, as was hypothesized, be modeled as a second-order factor. After perfection, because reliability is a function of sample (Dawis, 1987), the final SASS-STA model was evaluated on two samples from the intended target population.

There was good reason to believe that the teacher samples would differ in workplace autonomy because the samples were separated by a considerable period of time and NCLB changed the policy environment substantially for one sample (2003-2004 SASS (TQ04)) while the other (1999-2000 SASS (TQ00)) was not affected. The expected measurement variance between the samples was found; however, it remains unclear as to whether the measurement variance was caused by a Likert scale mismatch or interpretational confounding.

Because of the measurement variance found between the TQ00 and TQ04 samples, model reliability was explored using SEM multiple group analysis within the individual samples. That investigation revealed measurement invariance between select

groups (e.g., new male and female teachers) which suggested model generalization across groups and thus or construct reliability. The advantages of employing the vast SASS data sets was made immediately apparent when it was found that measurement invariance did not exist for teacher groups divided generally along lines of gender, age, highest degree held, or teaching experience. Those discoveries were really not surprising considering that the samples used in past inquiries were, in comparison to the SASS data sets, rather small and homogeneous. The SASS samples used here included the perceptions of thousands of teachers who were employed in thousands of schools with numerous organizational structures and policy approaches. For those reasons, measurement variance was a reasonable and expected result when examining the total TQ00 and TQ04 populations.

On the other hand, measurement invariance was observed when the examination focused on much narrower subsamples. For many groups of *new* teachers within both samples, measurement invariance was observed. That finding bolstered faith in the model's reliability because logic suggests that newcomers will have more similar perceptions of autonomy than veterans because the perceptions of experienced teachers are shaped and informed by actual organizational conditions, not the theory of university course work. Interestingly, the only groups that were found to display measurement invariance in the 2003-2004 SASS data sets were new male and new female teachers employed in both private and public schools. This result suggested two things: First, reliability because, as was mentioned previously, new teachers should logically display autonomy measurement invariance because they will have insufficient opportunities to develop fully informed workplace impressions. Second, because new male and new

female teachers were the only teacher groups to display measurement invariance in the 2003-2004 SASS, while several teacher groups displayed invariance in the 1999-2000 SASS, it is possible that the meaning of autonomy (i.e., interpretational confounding) is changing over time among certain teacher groups. That possibility is itself an important area for future exploration.

Conclusion

The American mindset has changed over time to favor increasing levels of federal and state influence over local education agencies to effect increased top-down control over teachers and teaching in an effort to improve student achievement (Wirt & Kirst, 2005). Yet, tightly controlling school organizations directly contradicts research that finds schools with more decentralized authority structures achieve better than traditional top-down bureaucratic structures (Blasé & Blasé, 1996). This may be so in part because "loose-coupling" would logically promote higher levels of teacher autonomy or elements thereof which have been shown to decrease attrition and stress, and increase job satisfaction, empowerment, and professionalism (Barnabe & Burns, 1994; Cohrs et al., 2006; Ingersoll, 1996; Kreis & Young Brockopp, 2001; Liu, 2007; Pearson & Moomaw, 2005). More specifically, higher perceptions of control, discretion, and influence decreases the probability that first-year teachers will leave the profession (Liu, 2007), diminishes the number of student misbehavior incidents, and improves collegial relationships (Ingersoll, 1996). For those reasons alone, it is surprising that teacher autonomy has received so little consideration.

The SASS-STA is unique because it is underpinned by the largest teacher data source available -- the U.S. Department of Education's National Center for Education

Statistics Schools and Staffing Survey. The use of this tremendous resource has imparted an extremely elusive quality to the SASS-STA – generalizability. Generalizability in concert with the rich variety of items contained in the SASS and in the Teacher Follow-up Survey promise copious opportunities to explore interactions between important leadership, organizational, and occupational variables and constructs.

Chapter 4: Teacher Autonomy: Using the SASS-STA to Examine Groups Targeted by Policy

The degree of autonomy perceived by teachers has been found to be indicative of current job satisfaction (Cohrs, Abele & Dette, 2006; Kreis & Young Brockopp, 2001; Pearson & Hall, 1993; Pearson & Moomaw, 2005; Ingersoll, 1997a, 1997b; Quiocho & Stall, 2008); and when teachers suffer diminished job satisfaction, they move to other schools or leave the profession entirely (Johnson and The Project on the Next Generation of Teachers, 2004). Hence, this inquiry employs Gwaltney's (2012b) Schools and Staffing Survey-Scale for Teacher Autonomy (SASS-STA), and the vast data contained within two iterations of the National Center for Educational Statistics Schools and Staffing Survey, to explore mean autonomy level differences among particular groups of teachers theorized to be more or less affected by accountability and job security policies. Then because autonomy is closely associated with the motivating potential of a job (Hackman & Oldham, 1975, 1976), the SASS-STA is then incorporated into an adaptation of Hackman and Oldham's Motivating Potential Score to probe how group differences in autonomy may be impacting teaching's motivating potential.

Investigating teacher autonomy and the relationship between teacher autonomy and the motivating potential of teaching is important because the teacher attrition rate is a full six percentage points higher on average than for other similarly situated groups of workers (Nobscot Corporation, 2004). Furthermore, there are reasons to suspect that the characteristics of teachers within particular groups make them more susceptible to attrition (Ingersoll, 2001).

Attrition is particularly acute for mathematics, science, and special education teachers (Boe, Bobbit, & Cook, 1997; Rumberger, 1987), teachers with higher test scores and better college academic records (Murnane & Olsen, 1989, 1990), more skilled teachers in poor urban schools (Lankford, Loeb & Wyckoff, 2002), and for beginning teachers (Bobbitt, Leich, Whitener & Lynch, 1994; Boe, Bobbitt, Cook, Barkanic & Maislin, 1998). In fact, forty-six percent of new teachers (50 percent in urban districts) leave teaching sometime during the first five years of service (Ingersoll, 2001; Ingersoll, 2002a, 2002b). Taken together, unacceptably high attrition rates -- particularly among skilled veterans in hard to fill positions -- in combination with the fifty-thousand dollar cost of recruiting, hiring, preparing, and losing a teacher (Chase, 2000; Carroll & Fulton, 2004), presents significant quality and financial challenges to cash strapped school districts.

Autonomy is a central and essential element in human motivation, job satisfaction, and public policy theory. Porter (1963) considered the human need for autonomy so important that he amended Maslow's (1943) iconic structure to explicitly include autonomy and placed it as the second highest in his own hierarchy. Herzberg, Mausner and Snyderman (1959) extended Maslow's theory to the workplace when they stated that worker satisfaction is only realized when higher level needs, such as autonomy, are satisfied. Lipsky (1980) argued that public sector employees like teachers, police officers, and social service workers -- or those he referred to as street-level bureaucrats -- *require* autonomy in the workplace because certain characteristics of their jobs make doing their work difficult if not impossible without it. Taking the theoretical importance of autonomy under consideration, it should come as no surprise

that it is a ubiquitous situational predictor in influential empirical job satisfaction models.

Warr (1999) specified autonomy, self-determination, skill utilization, job demands, normative requirements, skill variety, task variety, task feedback, absence of job insecurity, and availability of money as relevant job satisfaction predictors. Karasek and Theorell (1990) identified autonomy, workload, and social support by colleagues or supervisors in the Job Demands-Control-Support Model. Hackman and Oldham's, (1975, 1976) Job Characteristic Model (JCM), which has been vetted in a substantial number of studies (Barnabe & Burns, 1994; Cohrs et al., 2006; Fried & Ferris, 1987; Loher, Noe, Moeller & Fitzgerald, 985) and employed here as a guiding construct, states that jobs high in autonomy, feedback, skill variety, task identity, and task significance create the requisite motivating potential such that if jobholders perform well in their jobs they are likely to be reinforced. As a consequence of reinforcement, personal drive to act effectively is re-energized (Hackman & Oldham, 1976).

Clearly autonomy is central consideration in human motivation, job satisfaction, and public policy theory as well as a prominent and important situational predictor in influential job satisfaction models. So there can be no question but that autonomy in general, and teacher autonomy in particular, deserve more investigation.

While there are nearly as many teacher autonomy definitions as there are research efforts that have examined it, there is emerging consensus that teacher autonomy: (a) is complex and multidimensional (Friedman, 1999; Gawlik, 2007; Gwaltney, 2012a; Gwaltney, 2012b; Pearson & Hall, 1993; Pearson & Moomaw, 2005, 2006); (b) should account for individual and collective faculty control, discretion, and

influence (Friedman, 1999; Gawlik, 2007; Gwaltney, 2012a, 2012b; Ingersoll, 1996, 2001); and (c) ought to refer to the consequential productive operations and activities that teachers perform both in the classroom and in the school-wide organization (Friedman, 1999; Gawlik, 2007; Gwaltney, 2012a; Gwaltney, 2012b; Ingersoll, 1996, 2001; Kreis & Young Brockopp, 2001). So in response to a need for a research standard, Gwaltney (2012a,) defined teacher autonomy as: "the degree to which teaching provides substantial freedom, independence, power, and discretion to participate in scheduling, selecting, and executing administrative, instructional, and socialization and sorting activities both in the classroom and in the school organization at large." The definition was used an essential criterion by which Schools and Staffing Survey (SASS) items were selected for use in the SASS-STA (Gwaltney, 2012b).

The Schools and Staffing Survey-Scale for Teacher Autonomy (SASS-STA)

Figure 6 depicts the Schools and Staffing Survey-Scale for Teacher Autonomy (SASS-STA) (Gwaltney, 2012b). The second-order teacher autonomy factor is reflected in four first-order factors which are indicated by identically worded 1999-2000 (TS99) and 2003-2004 (TS03) SASS Teacher Questionnaire items previously determined to be authentic indicators of teacher autonomy (Gwaltney, 2012b). TS99 items were used to establish the SASS-STA using structural equation model chi-square comparisons as well as fit indices. The same dimensions emerged using identically worded items contained in TS03 iteration suggesting that the instrument was reliable and valid (Gwaltney, 2012b).

The Stylized Motivating Potential Score (SMPS)

This inquiry is informed by Hackman and Oldham's (1975, 1976) Job Characteristics Model (JCM), a process theory of work motivation. The JCM has been

vetted in a substantial number of studies (Barnabe & Burns, 1994; Cohrs et al., 2006; Fried & Ferris, 1987; Loher et al, 1985), is the dominant theoretical construct in work redesign (Hart, 1990), and the JCM definition of autonomy was used as the foundation

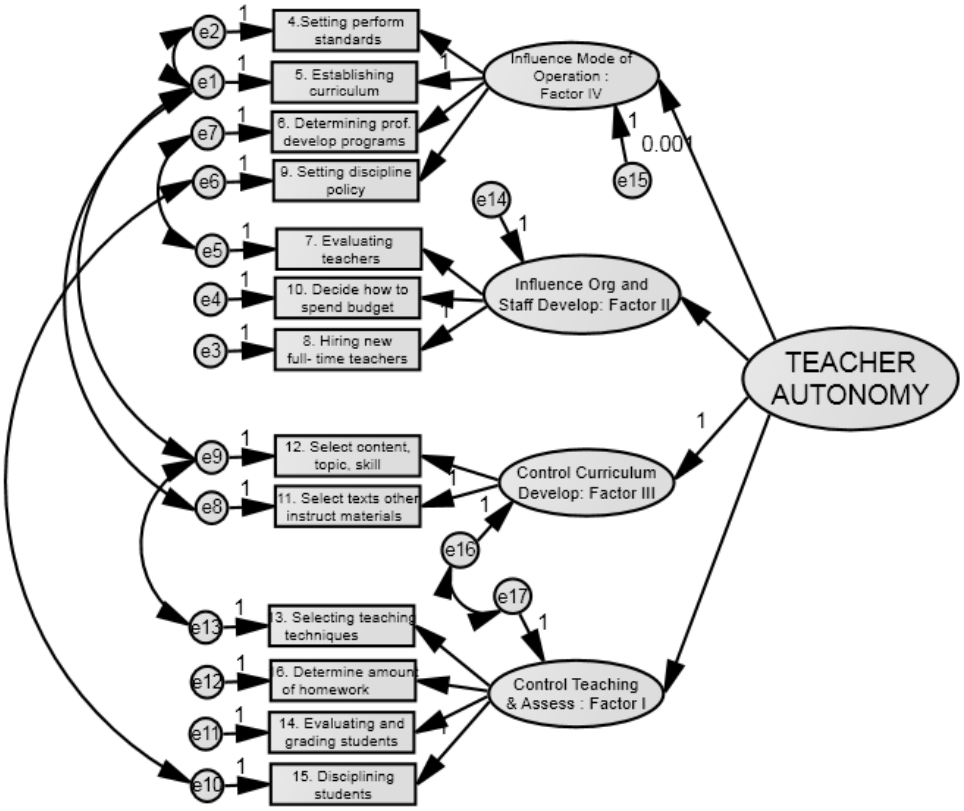


Figure 6. The Schools and Staffing Survey – Scale for Teacher Autonomy model upon which this inquiry's definition of teacher autonomy was built (Gwaltney, 2012a).

The JCM suggests that three important psychological conditions promote high internal work motivation: (a) experienced meaningfulness (i.e., feelings that work is generally valuable and worthwhile), (b) experienced responsibility (i.e., feelings of personally accountability and responsibility for the completed work), and (c) knowledge of the results (i.e., the ability of a worker to discern how effectively he/she is executing

the job). All three of the critical psychological states must be present for employees to develop strong internal work motivation.

Hackman and Oldham (1975) identified five measureable, objective, and variable job characteristics which create the three critical psychological states. Three of the five job characteristics (i.e., skill variety, task identity, and task significance) were theorized to contribute to work's experienced meaningfulness. Autonomy was theorized to contribute to experienced responsibility. Lastly, feedback measures knowledge of the results. The graphic overview presented in Figure 7 shows how the five characteristics relate to the three psychological states which are conducive to favorable outcomes.

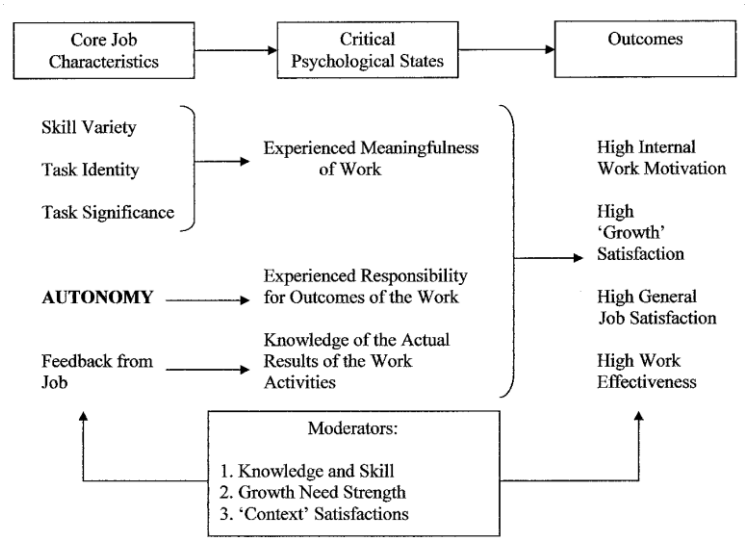


Figure 7. The complete Job Characteristic Model

Source: Hackman and Oldham (1975), Figure 1, p. 161.

Hackman and Oldham posited that combining the five job characteristics into a single score (i.e., Motivating Potential Score) would reflect the overall potential of a job to foster internal work motivation (see Figure 8). In addition, they stipulated that a job high in motivating potential must be high on at least one of the three characteristics (i.e., skill variety, task identity, or task significance) that prompt experienced meaningfulness

and high on both autonomy and feedback as well, to create conditions that foster all three of the critical psychological states.

$$\text{Motivating Potential Score (MPS)} = \left[\frac{\text{Skill Variety} + \text{Task Identity} + \text{Task Significance}}{3} \right] \text{X (}\mathbf{\text{Autonomy}}\text{) X (Feedback)}$$

Figure 8. Motivating Potential Score equation.

Hackman and Oldham emphasized that the Motivating Potential Score (MPS) is a merely metric of the motivating potential of a job, and does not directly cause or measure the internal motivation, performance, or job satisfaction of employees. Instead, a job high in motivating potential creates sufficient conditions such that if the worker performs well, he/she is likely to experience reinforcement, and as a result, is driven to act effectively.

To measure and quantify the JCM variables, Hackman and Oldham (1974) developed a customized data gathering instrument called the Job Diagnostic Survey (JDS). Unfortunately, the SASS Teacher Questionnaires do not contain items that speak to every JCM construct. For example, there are no SASS items that adequately capture the skill variety (i.e., the degree to which a job requires a variety of different activities in carrying out the work involving the use of a number of different skills and talents) or task identity (i.e., the degree to which a job requires completion of a whole and identifiable piece of work) associated with teaching. There are however identically worded items in the 1999-2000 and 2003-2004 SASS Teacher Questionnaires that can fairly be described as pertaining to task significance or experienced meaningfulness of work, autonomy, feedback, and motivating potential. Therefore, an *adaptation* of the Motivating Potential Score (MPS) was modeled using those items.

Because the task identity and skill variety of teaching is arguably very similar for all groups of K-12 instructors the absence of those variables in the adaptation, or as it will hereafter be called the Stylized Motivating Potential Score (SMPS) model, was not considered prohibitively problematic. Going forward then, a single SASS item was used to represent task significance, and multiple SASS items were used to represent the latent autonomy, feedback, and motivating potential factors. The SMPS equation then became:

Stylized Motivating Potential Score (SMPS) =

Task Significance X (**Autonomy**) X (Feedback)

Figure 9. Stylized Motivating Potential Score equation

Figure 10 depicts the structural model representation of the Stylized Motivating Potential Score (SMPS).

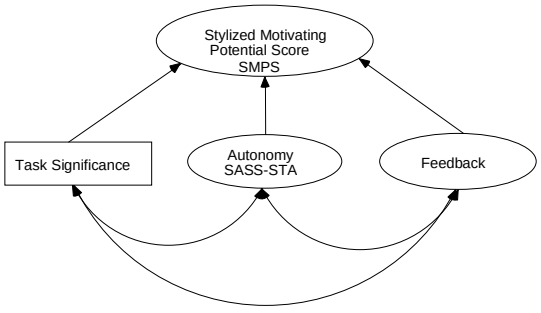


Figure 10. Stylized Motivating Potential Score structural model

Policy Motivated Autonomy Differences Among Teacher Groups

Policy can be thought of as the basic principles and guidelines formulated and enforced by the governing body of an organization used to direct and/or to limit its actions or the actions of those under its influence or jurisdiction in pursuit of long-term

goals. In other words, because policy regulates freedom, independence, and discretion; it will logically affect the autonomy of individuals and of institutions.

On one hand, policy can offer substantial autonomy nourishments in the form of shelter or protection from management. For example, in many states tenure practically grants teachers ownership of their jobs (Crisafulli, 2006) and research has shown that tenured teachers are less likely to quit when they disagree with school policies (Ingersoll, 2001). On the other hand, NCLB accountability provisions may harm the autonomy of teachers because instructors of particular disciplines have been required to modify or outright abandon their preferred pedegological approaches in favor of district or school prescribed teaching activities and curriculums. That type of supposition is supported by research which suggests when teachers cannot voice disagreement with or overtly challenge school policies, they are more likely to leave (Ingersoll, 2001). Obviously then, policy has the potential to impact teacher autonomy and if teacher autonomy affects motivating potential and job satisfaction it is important to examine the autonomy levels of teachers in groups that are more or less affected by particular policies.

Tenure - Experience

If a school district wishes to dismiss tenured teachers it must *prove* that those teachers have violated state law on grounds of insubordination, incompetence, immorality, professionalism, or unfitness (Crisafulli, 2006). So strong is the protection of tenure that teachers who possess it enjoy shelter against termination even if they are deemed to be relevant to the failure of students to sufficiently achieve per No Child Left Behind (NCLB) policy (Scheelhaase v. Woodbury Central Community School District et al., 1984). Because the shelter offered by tenure would logically improve teachers'

autonomy; it may be a major reason why veteran teachers have lower rates of attrition. It is therefore hypothesized that tenured teachers will perceive greater levels of autonomy than their non-tenured counterparts. An affirmative finding would certainly inform an explanation of why beginning teachers have much higher rates of attrition than those in mid-career (Bobbitt et al., 1994; Boe et al., 1998).

Union membership

Collective bargaining rights, in conjunction with the prodigious financial and organizational resources teachers' unions generate, have resulted in considerable political influence through the election of sympathetic candidates for positions ranging from school board to the Presidency (Coulson, 2010). Influencing elections is fundamental to union success and power because by choosing the officials with whom they will negotiate, unions augment the probability that they can secure policies that require or prohibit certain actions on the part of the management (Moe, 2009).

Generally, those policies place restrictions on top-down control by administration (Hoxby 1996; McDonnell & Pascall, 1979) while advancing the occupational interests of teachers including better pay and benefits, less threatening evaluation methods, smaller classes, limitations or prohibitions on non-classroom duties, and fewer course preparations (Moe, 2009). These union activity outcomes were explicitly characterized by Moe (2009) as expansion of worker autonomy. It is therefore hypothesized that teachers who have joined unions will perceive higher levels of workplace autonomy than teachers who have not.

NCLB Accountability

The No Child Left Behind (NCLB) act of 2001 required that an increasing percentage of students satisfactorily meet annual yearly performance targets (AYP) on standardized mathematics and English/language arts (ELA) tests until all students are able to perform at a proficient level by the 2013-2014 school year (NCLB; U.S. Congress, 2001). When schools failed to meet AYP for four consecutive years, NCLB required corrective action that would logically impact teacher autonomy. For example, district officials could elect to replace school staffers (including administrators) who were relevant to the failure, or implement curriculums and professional development activities that offered substantial promise of enabling the school to meet future AYP targets (NCLB; U.S. Congress, 2001). Each of those actions would logically provide incentives for, and strengthen the capacity of, school leaders to prescribe curriculums and to ensure that they are faithfully executed.

Research has found that ELA, math, science, social studies teachers, as well as teachers of students from low-income backgrounds feel more constrained, or less autonomous due to practice prescriptions (Crocco & Costigan, 2007; Day, 2002; Mathison & Freeman, 2003; Ogawa, Sandholtz, Martina-Flores, & Scribner, 2003; Quiocho & Stall, 2008). Crocco and Costigan (2007) found that beginning teachers in New York City believed that the prescriptive measures instituted in response to NCLB accountability incentives -- or curriculum narrowing as Manzo (2005) called it -- were responsible for: (a) successful teaching being defined as coverage of the mandated curriculum and fidelity in replicating scripted lessons, (b) increased time devoted to ELA and math while time devoted for other subjects decreased, (c) curriculums in ELA and

mathematics being prescribed to such a degree that pedagogical options were frequently limited, and (d) teacher perceptions that such conditions were oppressive and insulting especially when mentors and administrators insisted on compliance and adherence. Maybe most significantly, Crocco and Costigan (2007) found that beginning teachers based their decisions to remain at their schools on whether they had the creativity and autonomy needed for personal and professional growth (Crocco & Costigan, 2007).

Plainly, research supports the idea that NCLB provides powerful incentives for school leaders to closely scrutinize, control, and/or prescribe the classroom work of those who teach math and ELA because they are the teachers who are most relevant to the students' ability to meet AYP requirements. By the same rational, it is reasonable to suspect that teachers of non-assessed subjects (e.g., art, industrial arts, music, physical education) will be less scrutinized and less regulated because their subject matters are not assessed. On the other hand, the autonomy of non-assessed subject matter teachers may also be affected because, for example, school leaders might require teachers of non-assessed subject matters to dedicate part of their instruction to math and ELA, thereby making them relevant to AYP success or failure as well. For those reasons, it is possible that NCLB may be impacting the autonomy of all teachers. However, because school leaders would logically have more incentive to prescribe the practice of teachers who are most directly responsible for student achievement as defined by NCLB, it is hypothesized that math and ELA teachers will perceive lower levels of autonomy than their non-assessed colleagues.

Public, Charter, and Private Schools

Public charter schools are specifically designed to increase effectiveness and efficiency by combining parental choice and deregulation with accountability (Miron & Nelson, 2002, Nathan, 1996). As a result of deregulation, charters are believed to be more autonomous at the school level than conventional publics because they are ostensibly operated by the educators who work in them. That situation would logically reduce the influence of district, state, and federal authorities. In fact, the word *autonomous* is often used to characterize charter schools and the teachers who work in them because they supposedly possess more discretionary power to participate in the selection of curriculum and pedagogical practices as well as the freedom to contribute to, and participate in, administrative policies and duties (Miron & Nelson, 2002; Nathan, 1996).

Gawlik (2007) found that charter schools are more autonomous than conventional publics in relationship to their supervising governmental agencies; and that some of the teachers who worked in them could perceive a difference. Charter school teachers interviewed for the study who were former conventional public school employees indicated experiencing greater autonomy in their charter schools, particularly in schoolwide policy matters (i.e., school budget, curriculum, and human resource management) (Gawlik, 2007).

Chubb and Moe (1990) asserted that teacher autonomy should be greatly different between public and private schools and that contention is implicitly supported by research. If charters are more autonomous than conventional publics (Gawlik, 2007), it would follow that teachers in private schools should perceive the highest levels of autonomy because, in theory, they will be even less subject to governmental influences

than their charter school counterparts. With that line of reason in mind, it is hypothesized that: (a) teachers in private schools will perceive greater levels of autonomy than teachers in charter schools, (b) teachers in public charter schools will perceive greater levels of autonomy than conventional public school teachers. Relatively speaking then, the literature provides reasons to suspect that public school teachers will perceive the lowest levels of autonomy, charter school teachers will perceive higher autonomy levels, and private school teachers will perceive the highest relative mean levels of autonomy.

Method

Data for this project were drawn from the public and private school teachers' files of the 1999-2000 and 2003-2004 National Center for Education Statistics (NCES) School and Staffing Survey (SASS). Because the NCES designed SASS to be truly representative of all teachers in the United States, the data includes the perceptions of preK-12 teachers of every discipline in every state and contains a truly extraordinary array of ages, ethnicities, levels of training, education, and experience. The SASS 1999-2000 (TS99) included the perceptions of 52,404 public and private school employees. The 2003-2004 SASS iteration (TS03) contained 51,847. The TS99 and TS03 iterations were selected specifically to facilitate before and after NCLB comparisons. Unfortunately, key SASS-STA indicators were not included in the 2007-2008 SASS so data from that iteration was not analyzed.

SASS coding provides for group identification using descriptors such as Regular full-time teacher, Part-time teacher, Support staff, and Administrator. Because it is logical to expect that those categorized as something other than Regular full-time teacher would have differing stakes and roles in school organizations, it was assumed that they

would have also had differing needs for, and levels of, autonomy. Therefore, only the perceptions of those who described themselves as Regular full-time teachers were used for analysis. After all others were filtered out; the TS99 and TS03 respectively contained 46,877 and 46,305 public and private regular full- time teachers. Table 11 details the demographic breakdown of the TS99 and TS03 data sets.

Table 11

SASS 1999-2000, 2003-2004 Demographics/Characteristics

Demographic/ Characteristic	SASS 1999-2000 N = 46,877	SASS 2003-2004 N = 46,305
Men	15,115 (32%)	14,429 (31%)
Women	31,762 (68%)	31,876 (69%)
Union	29,334 (63%)	29,172 (63%)
Non-Union	17,543 (37%)	17,133 (37%)
Public	41,179 (88%)	39,918 (86%)
Private	5,698 (12%)	6,387 (14%)
Elementary	18,260 (39%)	14,614 (32%) 5,989 (13%) elementary/secondary.
Middle	23,632 (50%)	20, 516 (44%)
High	4,985 (11%)	5,186 (11%)
White	39,383 (84%)	40,767 (85%)
Black	2,894 (6%)	3,039 (6%)
Hispanic	2,145 (5%)	1,738 (3%)
Native American -- Asian/Pacific Islander	2,455 (5%)	3,094 (6%)
30 or Under	9,614 (21%)	8,826 (19%)
31 to 50	25,729 (55%)	23,373 (51%)
50 or Older	11,534 (24%)	14,106 (30%)
No Bachelor's	722 (2%)	1,240 (3%)
Bachelor's Degree	46,155 (99%)	45,065 (97%)
Master's Degree	19,375 (41%)	19,416 (42%)
Terminal Degree	1,769 (4%)	2,171 or (5%)

Public, public charter and private school teacher files were then extracted from the TS99. Unfortunately, only public and private files could be pulled from the TS03 because the 2003-2004 iteration did not disaggregate public charter school teachers from all teachers employed in public schools. Next, the public teacher files were divided to create files for public school union and public school non-union members. From there,

groups for secondary mathematics, secondary English/language arts (ELA), and secondary art/music teachers were extracted.

Because the SASS iterations used did not include a tenure status item, the new teacher item (NEWTCH) was used as a proxy. SASS classifies new teachers as those who, counting 1999-2000 and 2003-2004 school years respectively, were in their 1st, 2nd, or 3rd year of teaching. Coincidently, most states that award tenure to public school teachers do so following the third year of service. So after excluding teachers in states that required more than three years of probationary service (e.g., Kentucky, Indiana, Missouri, New York) as well as teachers who taught in states that did not have statewide tenure laws during 1999-2000 or 2003-2004 (e.g., Arkansas, Iowa, Kansas, Mississippi, Nebraska, South Carolina, Utah, Vermont) the use of the NEWTCH variable to divide the public school teacher files into tenured and untenured files was considered an imperfect but reasonable approximation. Tables 12 and 13 detail the sample sizes and demographic breakdowns for each of the subsamples examined.

Empirical Model Variables

Variables in the SASS-STA

The SASS-STA utilizes indicators taken from section VII (question 57a-g and 58 a-f) and section VIII (question 61a-g and 62a-f) of the TS99 and TS03 respectively. The indicators and factors of the SASS-STA are described below.

Factor I: Classroom Control over Student Teaching and Assessment. Four items are used to indicate a latent factor that describes teachers' classroom control over aspects of student teaching, assessment, and discipline. Each of the items (i.e., Selecting teaching techniques, Evaluating and grading students, Disciplining students, Determining the

amount of homework to be assigned) were prefaced by the question: How much control do you think you have in your classroom over each of the following areas of your planning and teaching? The factor was indicated by four TS99 items (TO295, T296, TO297, and TO298) and their identically worded counterparts in the TS03 (T0320, T0321, T0322, and T0323).

Factor II: Schoolwide Influence over Organizational and Staff Development. Three items are used to capture how much actual influence teachers thought they collectively had over aspects of organizational policy. Specifically, the TS99 items measured teacher influence over teacher evaluation (T0289), hiring new full- time teachers (T0290), and deciding how the school will be budget spent (T0292). The identification numbers of the identically worded TS03 items were T0314, T0315, and T0317.

Factor III: Classroom Control over Curriculum Development. Two SASS items are used to indicate a latent variable that captures teachers' perceptions of their ability to control classroom curriculum development. Selecting textbooks/instructional materials and selecting content, topics, and skills to be taught were labeled T0293 and T0294 in the TS99. TS03 identified the items as T0318 and T0319. Both indicators were associated with the question: How much control do you think you have in your classroom over each of the following areas of your planning and teaching?

Factor IV: Schoolwide Influence over School Mode of Operation. This factor is indicated by four items in TS99 (i.e., T0286, T0287, T0288, and T0291) and TS03 (i.e., T0311, T0312, T0313, and T0316) that asked teachers to respond to the question: How much actual influence do you think teachers have over school policy in each of the

following areas? The items: Setting performance standards for students of this school, Establishing curriculum, Determining the content of professional development programs, and Setting discipline policy, were believed to capture the degree to which teachers believed that they as faculty had the ability to influence aspects of the schoolwide program.

Factor V: Teacher Autonomy. A second-order latent factor indicated by the four first-order factors just described (Gwaltney, 2012b).

Variables in the Stylized Motivating Potential Score Structural Model

Figure 10 suggests that task significance, autonomy, and feedback covary with one another, and that each contributes to the Stylized Motivating Potential Score (SMPS). Variables used to indicate each of the three job characteristics of the SMPS and the SMPS itself are identically worded items which exist 1999-2000 (TS99) and 2003-2004 (TS03) SASS.

Task Significance. Hackman and Oldham (1974, 1975) defined task significance as the degree to which the job has a substantial impact in the lives of other people, whether those people are in the organization or in the world at large. Unfortunately, there are no in-common items in the TS99 and TS03 that are similar to the Job Diagnostic Survey (JDS) items used to measure task significance like: In general, how significant or important is your job? That is, are the results of your work likely to significantly affect the lives or well-being of other people? (Hackman & Oldham, 1974, 1975). However, there was a SASS item that spoke to the experienced meaningfulness of teaching.

The item labeled TO318 in the TS99 and TO349 in the TS03 asked teachers to indicate on whether they strongly agreed or strongly disagreed with the statement: I

sometimes feel it is a waste of time to try to do my best as a teacher. That item was most like the JDS experienced meaningfulness items: Most of the things I have to do on this job seem useless or trivial, and Most of the people on this job feel that the work is useless or trivial (Hackman & Oldham, 1974, 1975). This was a welcome happenstance because experienced meaningfulness -- a critical psychological state -- is created by averaging skill variety, task identity, and task significance (see Figure 7). Therefore, the item was seen as an effective proxy because it provided some measure of representation for the average of all three job characteristics, rather than for the single task significance construct.

Autonomy. Teacher autonomy is modeled by the Schools and Staffing Survey-Scale for Teacher Autonomy (SASS-STA).

Feedback. The JDS recognizes two forms of feedback, feedback from the job itself and feedback from agents. Hackman and Oldham (1974, 1975) defined feedback from agents as the degree to which the employee receives information about his or her performance effectiveness from supervisors or co-workers. Interestingly, the authors did not consider feedback from agents to be a job characteristic per se and only included items to measure the construct (e.g., To what extent do managers or co-workers let you know how well you are doing on your job or Supervisors often let me know how well they think I am performing the job) in the JDS to provide supplementary information to the feedback from the job itself construct.

There were no items in either SASS iteration that could be considered similar to the feedback from the job itself definition or the JDS items used measure it. There was however SASS items similar to JDS feedback from agents items. Those items asked

respondents to indicate the strength of their agreement or disagreement with the statements: The principal lets staff members know what is expected of them, The school administration's behaviour toward the staff is supportive and encouraging, I receive a great deal of support from the parents for the work I do, and In this school, staff members are recognized for a job well done. In the end, feedback was modeled as a latent factor indicated by four in-common SASS items respectively labeled TO299, TO300, TO303, and TO312 in the TS99, and TO330, TO331, TO334, and TO342 in the TS03.

The Stylized Motivating Potential Score. The JCM measures motivating potential score directly with items like: Most people on this job feel a great sense of personal satisfaction when they do the job well, Most people on this job feel bad or unhappy when they find that they have performed poorly at work, and My opinion of myself goes up when I do this job well. No SASS items spoke directly to how teaching affected reinforcing feelings as did the JDS items just listed, so the SMPS was modeled using proxies.

Two SASS items: If you could go back to your college days and start over again, would you become a teacher or not, and How long do you plan on remaining in teaching, labeled TO339 and TO340 in TS99, and TO382 and TO383 in TS03 were identified. The first (TO339, TO382) was interpreted as measuring whether teachers were reinforced by their jobs to such a degree that they would choose to follow the same path all over again. The second (TO340, TO383) was believed to gauge the degree to which a respondent was reinforced by teaching by measuring their willingness to remain in the job. The SMPS was modeled as a latent factor reflected in those two SASS items.

SASS-STA Mean Structural Analysis

To examine mean differences in the teacher groups, structural equation modeling (SEM) mean structural analysis was employed. To facilitate such an analysis, a mean structure was imposed on the SASS-STA, previously established as a reliable and valid measure of teacher autonomy (Gwaltney, 2012b). Mean structural analysis forces the computation of regression coefficients which predict the mean of endogenous latent variables. SPSS Incorporated's PASW Statistics AMOS version18 computer program was used to complete the preliminary analyses, descriptive statistics, correlation matrix and to impose the mean structure to the SASS-STA. AMOS, in accordance with the aspects of mean structural analysis just discussed, causes/requires: (a) raw data as input not merely the covariance matrix, (b) factor loadings to be constrained equal across groups so that the measurement model is the same for both groups (If not constrained thusly, differences in means might be due to different measurement models), (c) means and variances to be estimated, (d) the means of one group's latents to be constrained to zero, making it the reference group, (e) the unconstrained group(s) means to be freely estimated in comparison to the reference group, and (f) each indicator variables' intercept, and the means of the error terms are set to be equal across groups.

Because instrument validation is a continuing process, this effort is interested in whether the SASS-STA: (a) would replicate to demonstrate a stable factor structure using much smaller sub-samples of the 1999-2000 and 2003-2004 SASS data sets, (b) could detect mean differences in teacher autonomy that theory suggests should be present between particular groups that are differently affected by policy, (c) could explain the nuances of autonomy differences detected.

Four comparisons of perceived autonomy level between policy affected groups are proposed. First, teachers who have achieved tenure will hypothetically have higher levels of autonomy than teachers who have not. This is because those who own their jobs will, in theory, possess greater ability to resist, modify, or in the extreme, ignore administrative directives or prescriptions thereby enhancing their autonomy.

Secondly, teachers who are members of unions will logically enjoy greater autonomy than nonmembers due to the various contractual protections provided by collective bargaining agreements. In theory, union membership should provide teachers with enhanced discretion to cope with the pressure provided by administrators, patrons, and policy.

The literature suggests that No Child Left Behind (NCLB) subjects certain groups of teachers to accountability pressure while other groups may remain largely unaffected. Because NCLB requires testing in mathematics and English/language arts (ELA), and that the results be used to determine whether AYP targets have been met, the autonomy of mathematics and ELA teachers may be diminished by curriculum and pedagogy prescription (Crocco & Costigan, 2007; Day, 2002; Mathison & Freeman, 2003; Ogawa, et al., 2003; Quiocho & Stall, 2008). At the same time, logic would suggest that administrators have less incentive to constrain or prescribe the practice of teachers whose subject matters are not assessed by NCLB.

Art and music are but two of many subjects that not assessed under NCLB. Unlike industrial/business arts or foreign language curriculums which are often perceived as essential to the vocational or higher educational success of students, art and music programs are often among the first to be scaled back or eliminated when budgets are lean.

This is interpreted as an indication that art and music curriculums are considered to be least relevant to the academic or occupational success of students. Therefore, the perceptions of art/music teachers were selected to compare to those of mathematics and ELA teachers because art/music programs are considered to be exemplars of non NCLB assessed subjects.

To facilitate more direct and accurate comparisons, the teacher groups were further narrowed to include only the perceptions of high school teachers. This was done because unlike elementary teachers who typically teach multiple subjects in self-contained classrooms, secondary teachers typically specialize in a particular discipline (e.g.., mathematics, art, music) and teach only that subject matter.

A fourth comparison will explore autonomy differences between conventional public, public charter, and private school teachers. It is expected that public school teachers will perceive lower levels of autonomy than teachers who practice in public charter schools because charter schools are intentionally designed to promote autonomy by increasing independence and freedom from governmental organizations (Miron & Nelson, 2002, Nathan, 1996). In theory then, charter school teachers will experience less curriculum narrowing and enjoy more discretionary power to participate in the selection of curriculum and pedagogical practices as well as freedom to contribute to administrative policies and duties (Fuller, 2000, Miron & Nelson, 2002; Nathan, 1996). For similar reasons, it was hypothesized that teachers in private schools would perceive the highest levels of teacher autonomy.

Finally, although only anecdotal comparisons are possible because of mismatched Likert scales. Comparisons between comparisons will be considered. Because NCLB

established substantial consequences for school personnel when schools repeatedly fail to meet or exceed AYP targets, including for the first time the possibility of termination, it is hypothesized that autonomy differences between NCLB assessed and non-assessed groups will be greater for teachers surveyed during the 2003-2004 SASS cycle than for those who participated in the 1999-2000 SASS iteration which occurred before NCLB's adoption. Furthermore, it is hypothesized that greater autonomy differences between groups will be observed in the 2003-2004 data for the other teacher groups considered (i.e., tenured vs. untenured, union members vs. independents, and charter/private vs. public) than those observed in the 1999-2000 data sets because NCLB inspired practice prescriptions may impact those teachers as well.

Unfortunately, these types of comparisons must be anecdotal because direct empirical comparisons are not conducted between the SASS iterations due to variance concerns caused by the use of four-point Likert scales in the TS99 while their identical TS03 counterparts are rated on five point scales. Unlike other SEM software programs (e.g., M-Plus), AMOS version 18 does not seem to offer a maximum likelihood remedy for such a scale mismatch. Therefore, anecdotal observations regarding the magnitude of autonomy differences between the SASS iterations will be used to evaluate any perceived post NCLB widening of teacher autonomy gaps.

In accordance with the theory and logic presented above, four research questions were formulated to explore perceived autonomy differences between teacher groups. It is hypothesized that:

1) Tenured teachers who were employed in public schools would perceive higher levels of teacher autonomy on average than non-tenured teachers in public schools.

2) Pubic school teachers who were union members would perceive higher levels of autonomy than non-members.

3) Public secondary teachers of disciplines that are specifically assessed by NCLB (i.e., mathematics and English/language arts) would perceive lower levels of on-the-job autonomy than public secondary teachers of subject matters that are not assessed (i.e., art/music).

4) Public school teachers would perceive the lowest levels of autonomy, charter school teachers would have higher perceptions than their public counterparts, and that teachers who were employed in private schools would have the highest autonomy perceptions.

Analysis of the Stylized Motivational Potential Score Structural Model

The Stylized Motivating Potential Score (SMPS) structural model was developed using a three-step analysis plan which included model development, estimation and revision, and cross-validation. The SMPS development began with an a priori model based on Hackman and Oldham's (1975, 1976) Motivating Potential Score (see Figure 8), and proceeded by selecting in-common items from the TS99 and TS03 that were shown to be (a) similar to items used in Hackman and Oldham's Job Diagnostic Survey, or (b) fit the common definitions of the explanatory and outcome constructs noted in the variables section of this article.

The factor pattern as well as the relationships among and between the latent variables was fully specified to define a latent variable structural equation model. Latent variables (represented by circles or ovals) are factors that are estimated through confirmatory factor analysis (CFA) and are reflected in their indicators or observable variables (represented by squares or rectangles). For example, the latent SMPS variable, is represented by an oval, and task significance, an observable measured variable, is symbolized as a rectangle.

SEM CFA with maximum likelihood estimation in SPSS Incorporated's PASW Statistics AMOS version18 tested the SMPS measurement model. SEM executes CFA and path analysis simultaneously. The paths illustrated by arrows between latent variables (i.e., the structural model) estimate the interaction of latent variables. That feature is of great utility in the analysis of the SMPS structural model because the relationships among the variables (i.e., feedback, teacher autonomy, task significance, and SMPS) will be used to examine how each impacts the SMPS.

The use of the single item to represent task significance was considered to be a SMPS weakness because latent variables more closely approximate the constructs of interest in SEM. This is because unlike single observable variables, latent variables indicated by two or more indicators: (a) do not contain error due to the fact that they reflect what is common in their indicators, and (b) are not scale specific so they eliminate the effect of specific variance in the observed variables (Garson, 2012). For those reasons, latent variables well represent model constructs because they provide more accurate estimates of the true effect of one variable on the other (Garson, 2012; Kline, 2005).

Table 12

1999-2000 SASS Teacher Sub-group Demographics/Characteristics

Demographic/ Characteristic	Tenured N = 26,732	Non-tenured 5,938	Union 28,649	Non-Union 9,726	Public 38,375	Charter 2,449	Private 5,698	Math 2,839	English 3,013	Art/Music 1,378
Men	8,914	1,993	9,372	3,514	12,886	663	1,473	1,333	753	699
	(33%)	(34%)	(33%)	(36%)	(34%)	(27%)	(26%)	(47%)	(25%)	(51%)
Women	17,818	3,945	19,277	6,212	25,489	1,786	(4,225)	1,506	2,260	679
	(67%)	(66%)	(67%)	(64%)	(66%)	(63%)	(74%)	(53%)	(75%)	(49%)
Union Members	20,062	3,471	28,649	0	28,649	592	0	2,074	2,263	995
	(75%)	(59%)	(100%)	(0%)	(75%)	(24%)	(0%)	(73%)	(75%)	(72%)
Non-Union	6,670	2,467	0	9,726	9,726	1,857	5,698	765	750	383
	(25%)	(41%)	(0%)	(100%)	(25%)	(76%)	(100%)	(27%)	(25%)	(28%)
Conventional Public/BIA	25,463	4,779	28,649	9,726	38,375	0	0	2,839	3013	1,378
	(95%)	(81%)	(100%)	(100%)	(100%)	(0%)	(0%)	(100%)	(100%)	(100%)
Public Charter	1,269	1,159	0	0	0	2,449	0	0	0	0
	(5%)	(19%)	(0%)	(0%)	(0%)	(100%)	(0%) (0%)	(0%)	(0%)	
Private	0	0	0	0	0	0	5,698	0	0	0
	(0%)	(0%)	(0%)	(0%)	(0%)	(0%)	(100%)	(0%)	(0%)	(0%)
Elementary	7,910	1,966	8,231	2,399	10,630	1,229	3,029	0	0	0
	(30%)	(33%)	(29%)	(25%)	(28%)	(50%)	(53%)	(0%)	(0%)	(0%)
Middle	3,543	740	3,839	1,254	5,093	196	0	266	306	161
	(13%)	(13%)	(13%)	(13%)	(13%)	(8%)	(0%)	(9%)	(10.2%)	(11.7%)
Secondary	12,964	2,550	14,300	5,190	19,490	570	1,337	2,570	2,697	1212
	(48%)	(43%)	(50%)	(53%)	(51%)	(23%)	(24%)	(90.9%)	(89.5%)	(88%)
Combination	2,315	682	2,279	883	3,162	454	1,332	3	10	5
	(9%)	(11%)	(8%)	(9%)	(8%)	(19%)	(23%)	(0.1%)	(0.3%)	(0.4%)
Black	1,697	485	1,950	537	2,417	286	191	165	163	62
	(6%)	(8%)	(7%)	(6%)	(6%)	(12%)	(3%)	(5%)	(5%)	(5%)
Hispanic	1,295	437	1,215	485	1,700	173	252	77	86	35
	(5%)	(7%)	(4%)	(5%)	(4%)	(7%)	(4%)	(3%)	(3%)	(3%)
Native American Asian/Pacific Islander	1,689	432	1,589	460	1,958	121	211	137	89	43
	(6%)	(7%)	(5%)	(5%)	(5%)	(5%)	(4%)	(4.9%)	(3%)	(3%)
White	22,051	4,584	23,895	8,244	32,300	1,869	5044	2,460	2,675	1238
	(83%)	(78%)	(84%)	(84%)	(85%)	(76%)	(89%)	(87%)	(89%)	(89%)
30 or younger	2,673	3,800	4,870	2,140	7,291	980	1,482	653	663	248
	(10%)	(64%)	(17%)	(22%)	(19%)	(40%)	(26%)	(23%)	(22%)	(18%)
31-50	16, 039	1,900	15,470	5,544	21,490	1,151	2,849	1,505	1,446	813
	(60%)	(32%)	(54%)	(57%)	(56%)	(47%)	(50%)	(53%)	(48%)	(59%)
51 and older	8,020	238	8,309	2,042	9,594	318	1,367	681	904	317
	(30%)	(4%)	(29%)	(21%)	(25%)	(13%)	(24%)	(24%)	(30%)	(23%)
No Bachelors Degree	282	112	238	143	381	73	259	3	8	2
	(1%)	(2%)	(1%)	(2%)	(1%)	(3%)	(5%)	(0.1%)	(0.3%)	(0.1)
Bachelors Degree	26,450	5,826	28,649	9583	37,994	2,376	5,439	2836	3,005	1,376
	(99%)	(98%)	(99%)	(98%)	(99%)	(97%)	(95%)	(99.1%)	(99.7%)	(99.9%)
Masters Degree	12,212	1,103	13,343	3,368	16,711	676	1,862	1,267	1,408	551
	(46%)	(19%)	(47%)	(35%)	(44%)	(28%)	(33%)	(45%)	(47%)	(40%)
Ed.S.	906	62	918	257	1,175	63	97	68	92	28
	(3%)	(1%)	(3%)	(3%)	(3%)	(3%)	(2%)	(2.4%)	(3%)	(2%)
Ph.D.	249	41	232	83	315	27	80	26	33	7
	(0.8%)	(0.7)	(0.8%)	(0.9%)	(0.8)	(1%)	(1%)	(0.9%)	(1%)	(0.5%)

Note: BIA = Bureau of Indian Affairs

Table 13

2003-2004 SASS Teacher Sub-group Demographics/Characteristics

Demographic/ Characteristic	N =	Tenured 26,260	Non-tenured 4,786	Union 28,437	Non-Union 10,896	Public 39,333	Charter --	Private 6,387	Math 2,819	English 3,324	Art/Music 1,407
Men		8,647	1,606	9,030	3,808	12,838		1,427	1,230	786	643
		(33%)	(34%)	(32%)	(35%)	(33%)		(22%)	(44%)	(24%)	(46%)
Women		17,613	3,180	19,407	7,088	26,495		4,960	1,589	2,538	764
		(67%)	(66%)	(68%)	(65%)	(67%)		(78%)	(56%)	(76%)	(54%)
Union Members		19,870	3,077	28,437	0	28,437		472	2,021	2,451	1003
		(76%)	(64%)	(100%)	(0%)	(72%)		(7%)	(72%)	(74%)	(71%)
Non-Union		6,390	1,709	0	10,896	10,896		5,915	798	873	404
		(24%)	(36%)	(0%)	(100%)	(28%)		(93%)	(28%)	(26%)	(29%)
Conventional Public/BIA		26,260	4,786	28,437	10,896	39,333		0	2,819	3,324	1,407
		(95%)	(81%)	(100%)	(100%)	(100%)		(0%)	(100%)	(100%)	(100%)
Public Charter											
Private		0	0	0	0	0		6,387	0	0	0
		(0%)	(0%)	(0%)	(0%)	(0%)		(100%)	(0%)	(0%)	(0%)
Elementary		7,302	1,291	7,944	2,638	10,582		3,733	0	0	0
		(28%)	(27%)	(28%)	(24%)	(27%)		(58.6%)	(0%)	(0%)	(0%)
Middle		3,398	635	3,924	1,216	5,140		28	246	321	129
		(13%)	(13%)	(14%)	(11%)	(13%)		(0.4%)	(9%)	(10%)	(9%)
Secondary		12,650	2,277	13,865	5,511	19,376		1,040	2,573	3,003	1,278
		(48%)	(48%)	(49%)	(51%)	(49%)		(16%)	(91%)	(90%)	(91%)
Combination		2,910	584	2,704	1,531	4,235		1,586	0	0	0
		(11%)	(12%)	(9%)	(14%)	(11%)		(25%)	(0%)	(0%)	(0%)
Black		1,662	457	1,921	798	2,719		307	180	220	79
		(6%)	(10%)	(7%)	(7%)	(7%)		(5%)	(6%)	(7%)	(6%)
Hispanic		1,050	310	945	504	1,449		262	95	98	39
		(4%)	(7%)	(3%)	(5%)	(4%)		(4%)	(3%)	(3%)	(3%)
Native American Asian/Pacific Islander		2,051	479	1,860	627	2,487		361	170	137	54
		(8%)	(10%)	(7%)	(6%)	(6%)		(6%)	(6%)	(4%)	(4%)
White		22,929	3,939	25,044	9,591	34,636		5,782	2,506	3,010	1290
		(87%)	(82%)	(88%)	(88%)	(88%)		(91%)	(89%)	(90%)	(92%)
30 or younger		2,626	2,824	4,550	2,397	7,080		1,661	648	632	267
		(10%)	(59%)	(16%)	(22%)	(18%)		(26%)	(23%)	(19%)	(19%)
31-50		14,443	1,675	14,503	5,775	20,060		2,874	1,494	1,529	718
		(55%)	(35%)	(51%)	(53%)	(51%)		(45%)	(53%)	(46%)	(51%)
51 and older		9,191	287	9,384	2,724	12,193		1,852	677	1,163	422
		(35%)	(6%)	(33%)	(25%)	(31%)		(29%)	(24%)	(35%)	(30%)
No Bachelors Degree		383	115	359	272	631		596	12	15	5
		(2%)	(2%)	(1%)	(3%)	(2%)		(9%)	(0.4%)	(0.5%)	(0.5)
Bachelors Degree		25,877	4,671	28,078	10,624	38,702		5,791	2807	3,309	1,400
		(98%)	(98%)	(99%)	(97%)	(98%)		(91%)	(99.6%)	(99.5%)	(95.5%)
Masters Degree		12,354	1,028	13,501	3,921	17,422		1,797	1,293	1,614	624
		(47%)	(22%)	(48%)	(36%)	(44%)		(28%)	(46%)	(49%)	(44%)
Ed.S.		1101	57	1,140	317	1,457		119	72	148	52
		(4%)	(1.2%)	(4%)	(3%)	(4%)		(1.5%)	(2.6%)	(4.5%)	(4%)
Ph.D.		331	57	351	119	470		97	32	50	20
		(1.3%)	(1.2%)	(1.2%)	(1.1%)	(0.8)		(1.5%)	(1.1%)	(1.5%)	(1.4%)

Note: BIA = Bureau of Indian Affairs. Pubic charter school teachers are not disaggregated from regular public school teachers in the 2003-2004 SASS, thus frequencies for public charter school teachers are not reported in Table 13.

After the initial SMPS model was estimated using TS99 data, the fit indices provided by AMOS were examined to evaluate the adequacy of the model in explaining the data. Those fit indices indicated adequate data fit, but based on the examination of the AMOS provided modification indices and residuals, it was clear that model respecification could improve the model. However, because parsimonious models are more desirable and model modification should be conservative, only logically justifiable modifications were carried out (Kline, 2005).

Respecification improved the fit of the model and, according to AMOS fit indices, offered an adequate to good explanation of the data. The final SMPS structural model indicated that task significance, teacher autonomy, and feedback covaried with one another and that each directly affected the Stylized Motivating Potential Score (SMPS). Because the development of the final SMPS model required respecification to achieve better fit to the TS99 data; cross-validation on new data was indicated. For that reason, in the final step of model establishment, SASS-2003-2004 data was used for cross-validation. In the end, the SMPS structural model will be used to explore one research question: How does teacher autonomy impacts teaching's motivating potential.

Results

Variable means, standard deviations, and intercorrelations are shown in Table 14. Based on the SASS-STA fit indices (see Appendix 4A, Table 4A1), Gwaltney (2012b) asserted that the SASS-STA fit the TS99 and TS03 data sets well. In addition, the SASS-STA did indeed demonstrate a stable factor structure. AMOS model fit indices suggested adequate to good model/data fit (see Appendix 4B) for all of the teacher subgroups examined using much smaller sub-samples of the 1999-2000 and 2003-2004 SASS data

sets respectively. Those results suggested that the model generalized across groups, therefore the imposition of a mean structure was considered appropriate and group comparisons of autonomy means were explored. The results of the comparisons are detailed in Table 15.

SASS-STA Mean Structural Analysis

Research Question 1: Tenured vs. Non-tenured Autonomy Levels

The first research question asked whether tenured teachers would perceive higher levels of teacher autonomy than non-tenured teachers due to the legal protections offered by tenure. The answer to that question was no but with a twist. The difference between the tenured (reference) and non-tenured groups in the TS99 and TS03 were significant but small (i.e., -0.03 and -0.04 respectively with effect sizes close to one twentieth of a standard deviation) however the negative coefficients indicated that the tenured public school teachers of both groups perceived slightly *less* autonomy than their non-tenured colleagues. This was surprising considering that tenured teachers in the public school system have very real and very significant legal protections including increased protection from the accountability provisions of NCLB.

One explanation for that finding may be that the tenured and non-tenured groups could easily be recast, as they were originally, into groups of experienced (those with more than three years of experience) and new teachers (those with 3 years or less experience) respectively. When viewed through that prism, it might well be that new teachers do not expect to be afforded high levels of autonomy or that they do not have the experience to properly judge their levels of workplace autonomy. On the other hand, more experienced teachers may perceive lower levels of autonomy than their

Table 14

SASS 1999-2000 AND SASS 2003-2004 Correlations and Descriptive Statistics

Study Variable		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SASS 2003-2004	M	2.66	2.84	2.45	1.70	1.81	2.42	1.79	3.01	3.13	3.70	3.75	3.52	3.74	3.46	3.34	2.69	2.98	1.55	3.92	3.92
	SD	.96	.95	.91	.82	.89	.94	.84	.99	.94	.57	.52	.67	.56	.73	.84	.90	.88	.86	1.16	1.33
TEACHER AUTONOMY SASS-STA																					
How much actual influence do you think teachers have over school policy?																					
1. Setting performance standards		--	.56	.39	.35	.26	.43	.28	.26	.29	.21	.18	.22	.13	.21	.26	.21	.28	-.19	.13	.07
2. Establishing curriculum		.60	--	.38	.32	.29	.36	.25	.41	.45	.28	.23	.21	.17	.14	.21	.18	.20	-.15	.14	.07
3. Determining prof devel		.40	.38	--	.42	.32	.42	.36	.21	.18	.16	.13	.18	.10	.24	.29	.16	.31	-.16	.14	.08
4. Evaluating teachers		.35	.33	.42	--	.45	.39	.37	.15	.17	.07	.05	.11	.04	.18	.22	.14	.26	-.10	.13	.07
5. Hiring new teachers		.29	.31	.33	.45	--	.40	.43	.16	.13	.10	.07	.13	.06	.12	.17	.12	.20	-.11	.09	.04
6. Setting discipline policy		.46	.40	.44	.40	.43	--	.41	.19	.19	.17	.14	.30	.11	.24	.32	.21	.33	-.19	.16	.08
7. Deciding how the school budget will be spent		.29	.26	.36	.35	.42	.41	--	.15	.13	.11	.08	.14	.06	.17	.21	.12	.25	-.10	.09	.05
How much classroom control do you think you over each of the following?																					
8. Selecting textbooks and other instructional materials		.29	.21	.23	.16	.17	.21	.15	--	.57	.35	.28	.20	.23	.08	.12	.12	.10	-.10	.08	.05
9. Selecting content, topics, and skills		.31	.44	.18	.14	.14	.20	.11	.55	--	.46	.36	.24	.28	.10	.11	.11	.09	-.09	.09	.05
10. Selecting teaching techniques		.22	.28	.16	.10	.10	.18	.10	.36	.47	--	.55	.37	.41	.10	.15	.10	.12	-.12	.10	.04
11. Evaluating and grading students		.20	.23	.12	.07	.07	.15	.07	.29	.37	.56	--	.40	.48	.10	.13	.08	.11	-.11	.07	.04
12. Disciplining students		.24	.22	.19	.05	.15	.33	.14	.20	.26	.37	.40	--	.38	.17	.22	.19	.20	-.20	.16	.08
13. Determining the amount of homework		.15	.18	.10	.04	.06	.12	.07	.24	.30	.43	.48	.35	--	.09	.12	.07	.09	-.09	.06	.04
FEEDBACK, Agree or disagree																					
14. Principal lets staff know expectations		.22	.16	.26	.20	.15	.28	.19	.09	.07	.10	.10	.19	.10	--	.60	.15	.48	-.20	.12	.08
15. Administration supportive encouraging		.29	.23	.31	.24	.20	.35	.24	.14	.12	.16	.15	.24	.12	.60	--	20	.57	-.23	.16	.10
16. Support from parents		.22	.18	.16	.15	.13	.22	.11	.13	.12	.11	.10	.22	.07	.16	.20	--	.27	-.22	.19	.09
17. Staff recognized for job well done		.28	.21	.31	.27	.21	.34	.25	.10	.09	.12	.11	.21	.09	.49	.57	.27	--	-.26	.19	.10
TASK SIGNIFICANCE, Agree or disagree																					
18. Waste of time to do my best		-.19	-.16	-.16	-.12	-.12	-.19	-.11	-.09	-.10	-.14	-.12	-.23	-.09	-.19	-.23	-.23	-.25	--	-.30	-.17
SMPS																					
19. Would you become a teacher again		.17	.15	.15	.14	.12	.18	.11	.08	.10	.11	.09	.21	.08	.13	.17	.20	.20	-.33	--	.35
20. How long will you remain in teaching		.09	.08	.08	.07	.05	.09	.05	.05	.05	.05	.04	.10	.04	.08	.10	.11	.11	-.19	.37	--
SASS 1999-2000	M	3.17	3.40	2.89	1.89	2.03	2.82	2.04	3.65	3.73	4.43	4.50	4.00	4.50	3.30	3.14	2.63	2.81	1.64	3.87	3.81
	SD	1.25	1.23	1.22	1.09	1.20	1.26	1.15	1.18	1.15	.79	.73	.96	.80	.81	.92	.94	.93	.92	1.18	1.36

Note: Correlations between the 2003-2004 variables represented in the upper half of the matrix. SASS 1999-2000 variable correlations entered below the diagona

Table 15

Mean Structural Analysis of all SASS-STA Factors

SASS 1999-2000				SASS 2003-2004			
Reference Group		Mean Estimated Group	p	Reference Group		Mean Estimated Group	p
Non-Tenured		Tenured		Non-Tenured		Tenured	
N = 26,732		N = 5,938	p	N = 26,260		N = 4,786	p
F5	--	-0.03	***	F5	--	-0.04	***
F4	--	-0.03	0.04	F4	--	-0.05	***
F3	--	0.13	***	F3	--	0.14	***
F2	--	-0.24	***	F2	--	-0.23	***
F1	--	-0.01	0.15	F1	--	0.04	***
Non-Union		Union		Non-Union		Union	
N = 9,726		N = 28,649	p	N = 10,896		N = 28,437	p
F5	--	-0.01	0.26	F5	--	0.01	0.47
F4	--	-0.02	0.12	F4	--	0.002	0.81
F3	--	-0.07	***	F3	--	-0.04	***
F2	--	0.02	0.12	F2	--	0.02	0.03
F1	--	-0.02	0.01	F1	--	0.00	0.96
Math		Art/Music		Math		Art/Music	
N = 2,839		N = 1,378	p	N = 2,819		N = 1,407	`p
F5	--	0.18	***	F5	--	0.71	***
F4	--	0.15	***	F4	--	0.16	***
F3	--	0.77	***	F3	--	0.71	***
F2	--	0.13	***	F2	--	0.12	***
F1	--	0.14	***	F1	--	0.10	***
English		Art/Music		English		Art/Music	
N = 3,013		N = 1,378	p	N = 3,324		N = 1,407	p
F5	--	0.19	***	F5	--	0.09	***
F4	--	0.18	***	F4	--	0.14	***
F3	--	0.62	***	F3	--	0.50	***
F2	--	0.20	***	F2	--	0.14	***
F1	--	0.12	***	F1	--	0.09	***

(continued)

SASS 1999-2000				SASS 2003-2004			
Reference Group		Mean Estimated Group	p	Reference Group		Mean Estimated Group	p
English		Math		English		Math	
N = 3,013		N = 2,839	p	N = 3,324		N = 2,819	p
F5	--	0.01	0.13	F5	--	-0.01	0.39
F4	--	0.03	0.29	F4	--	-0.02	0.36
F3	--	-0.16	***	F3	--	-0.23	***
F2	--	0.07	0.004	F2	--	0.02	0.27
F1	--	-0.02	0.29	F1	--	-0.01	0.37
Public		Private		Public		Private	
N = 38,375		N = 5,698	p	N = 39,333		N = 6,387	p
F5	--	0.44	***	F5	--	0.28	***
F4	--	0.50	***	F4	--	0.35	***
F3	--	0.25	***	F3	--	0.21	***
F2	--	0.12	***	F2	--	-0.01	0.23
F1	--	0.11	***	F1	--	0.70	***
Public		Charter		Public		Charter	
N = 38,375		N = 2,449	p	Charters not disaggregated in SASS 03-04			
F5	--	0.45	***	NA			
F4	--	0.44	***	NA			
F3	--	0.09	***	NA			
F2	--	0.45	***	NA			
F1	--	-0.02	0.25	NA			
Charter		Private		Charter		Private	
N = 2,449		N = 5,698	p	Charters not disaggregated in SASS 03-04			
F5	--	-0.16	0.54	NA			
F4	--	0.04	0.16	NA			
F3	--	0.17	***	NA			
F2	--	-0.30	***	NA			
F1	--	0.12	***	NA			

Note. F5 = Teacher Autonomy, F4 = Schoolwide Influence over School Mode of Operation, F3 = Classroom Control over Curriculum Development, F2 = Schoolwide Influence over Organizational and Staff Development, F1 = Classroom Control over Student Teaching and Assessment. Reference group mean in mean structural analysis is set to zero and the value for the mean estimated group is referenced to the reference value. *p < .05, **p < .01, ***p < .001

inexperienced counterparts because they have more informed impressions of how much autonomy the workplace will actually allow.

Support for that explanation may be found in the mean difference of Factor II -- Schoolwide Influence over Organizational and Staff Development. Factor II was found to have the largest significant mean differences (-0.24 and -0.23) between the non-tenured and tenured public teacher groups in both the TS99 and TS03 respectively. In both instances, the tenured teachers were found to have significantly lower perceptions of the faculty's ability to influence teacher hiring, teacher evaluation, and the appropriation of school funds; all aspects of school policy which would require greater levels of workplace experience and understanding than would be expected of newcomers to teaching.

Research Question 2: Union vs. Non-union Autonomy Levels

The second research question focused on whether union members would perceive higher levels of autonomy than non-members. No significant mean difference was found in the perceived autonomy levels between public school teachers who had joined teacher unions and those who had not in either SASS iteration. That finding may have been due to awareness of union advantages, or put another way, teachers who are not members of unions may be unaware of benefits (e.g., pay and benefit increases or job security guarantees) won by union negotiators that accrue to all teachers whether they are members are not. Alternatively, union members may be just as unaware of union protections and/or benefits because they do not directly participate in union activities or avail themselves of union services (e.g., legal representation) until they are needed.

Research Question 3: NCLB Assessed vs. Non-assessed Autonomy Levels

One of the more interesting research questions investigated the possibility that public high school teachers of disciplines which are specifically singled out for assessment under NCLB would perceive lower levels of on-the-job autonomy than high school teachers of subject matters which are not assessed. The analysis supported the contention that high school math and ELA teachers perceive less autonomy than their art/music colleagues.

In both the TS99 and TS03 samples, art/music teachers were found to have significantly higher levels of perceived autonomy than math and ELA teachers. In the TS99 subsamples, very similar autonomy differences (0.18 and 0.19 respectively) were found. Moreover, the effect sizes were substantial with the art/music teachers being more than half a standard deviation higher in autonomy than the mathematics and ELA teachers (0.61 and 0.56 respectively).

In the TS03 subsamples art/music teachers were also found to perceive higher mean levels of autonomy than math and ELA teachers (0.71 and 0.09 respectively). However, unlike the very similar differences observed in the TS99 sample, the differences in the TS03 were very different. On average, the perceptions of art/music teachers surveyed during the 2003-2004 school year were merely 0.09 higher than their ELA colleagues, a difference that translated to an effect size of about one-third of a standard deviation. At the same time, the autonomy perceptions of the art/music teachers in the TS03 sample were much higher than the perceptions of math teachers. On average, art/music teachers were found to be 0.71 higher in mean perceived autonomy levels than mathematics teachers which suggested that the autonomy perceptions of art/music

teachers were nearly two and three-quarters standard deviations greater than those of math teachers surveyed during the 2003-2004 school year.

The perceived autonomy differences observed between the NCLB assessed and non-assessed subject matter teachers presented a somewhat puzzling situation. Very much in contrast with the hypothesis that NCLB would serve to decrease the autonomy of teachers of assessed disciplines, the anecdotal gaps in mean autonomy difference observed between art/music and ELA teachers in the TS03 sample, as compared to the difference observed in the TS99 sample, suggested that the difference in the autonomy perceptions actually narrowed after NCLB was implemented. On the other hand, the hypothesis was supported by anecdotal observations which seemed to indicate that the mean autonomy differences between art/music and math teachers widened dramatically during the period that spanned the time before NCLB was enacted and after it was implemented.

So what might account for the gap between the assessed and non-assessed subject matter mean autonomy levels both narrowing in the case of the ELA and art/music teachers, and widening in the case of the teachers of math and art/music, when in theory, both should widen if NCLB has increased the prevalence of curriculum narrowing? To further explore that question, the mean differences between the first-order SASS-STA factors were examined.

While there were, for the most part, very consistent and smallish differences between the coefficients representing the mean differences between three of the four first-order factors in the comparison samples (see Table 15), the difference coefficients for Factor III -- Classroom Control over Curriculum Development -- were noticeably

different between the TS99 and TS03 samples of ELA and art/music teachers. In the TS99 sample, art/music teachers were found to enjoy Factor III levels that were on average 0.62 higher than ELA teachers. That difference decreased to 0.50 in the 2003-2004 samples suggesting that ELA teachers believed that their classroom control over the selection of textbooks/instructional materials and content, topics, and skills to be taught increased after NCLB was implemented. In contrast, the Factor III differences between math and art/music teachers remained relatively constant over the same time period. Those results suggested anecdotally, because direct empirical comparisons were not conducted between the TS99 and TS03 teacher groups, that curriculum narrowing may affect math teachers more than ELA teachers. To explore that notion, comparisons between ELA and math teachers were conducted and the results presented in Table 15.

Using ELA teachers as the reference, direct mean structural analysis comparisons found no significant difference between the autonomy levels of ELA and mathematics teachers within either SASS sample. Those findings supported the contrapositive of the hypothesis stating that differences would be found, as they were, between teachers of assessed and non-assessed disciplines. In other words, that there would be no significant differences in the perceived autonomy levels of teachers who teach NCLB assessed disciplines. There was however a glaring area of difference between the ELA and mathematics teachers when first-order factors were examined. Factor III -- Classroom Control over Curriculum Development -- was found to be significantly different in both the TS99 and TS03 comparison samples.

In line with the supposition that curriculum narrowing may affect math teachers more than ELA teachers, the negative coefficients suggested that mathematics teachers

did indeed perceive less classroom control over curriculum related aspects such as the selection of textbooks/instructional materials and content, topics, and skills to be taught. Furthermore, while the analysis implied that mathematics teachers perceived less control over classroom curriculum aspects before NCLB was enacted, the increased magnitude of the TS03 sample Factor III coefficient suggested, anecdotally, that mathematics teachers may have perceived even less control than their ELA colleagues after NCLB was implemented.

Taken together, the analysis of the mean autonomy differences between teachers of assessed disciplines and teachers of disciplines that are not assessed under NCLB accountability policies supported the findings of Crocco and Costigan (2007) and Manzo (2005) which suggested that curriculum narrowing adversely affects teacher autonomy. Interestingly, the results of the current inquiry also suggest that curriculum narrowing may be effecting math teachers more than ELA teachers. Logically, that may be because student achievement in mathematics has long been used as the ultimate metric of educational success at the student, school, district, state, national, and international levels. Therefore, it stands to reason that mathematics curriculums may have always been more subject to prescription.

Research Question 4: Public vs. Charter and Private Autonomy Levels

The fourth research question asked if public school teachers would perceive lower levels of perceived autonomy than their charter or private school counterparts. In short, the results of the inquiry supported the underlying hypothesis of the question, the findings of Gawlik (2007), and the assertion of Chubb and Moe (1990).

Table 15 indicates that teachers in private schools perceived themselves to be significantly higher in perceived autonomy. On average, private school teachers perceived mean autonomy levels that were 0.44 higher (i.e., slightly more than half a standard deviation) than teachers who practiced in public schools during the 1999-2000 school year. During the 2003-2004 school year, private school teachers again perceived higher levels of mean autonomy than their public counterparts; however the coefficient (0.28) was approximately half of the 1999-2000 difference which translated to an effect size of slightly less than half of a standard deviation's difference. The smaller mean autonomy difference coefficient observed in the TS03 samples followed a pattern which indicated that three of the four mean difference coefficients of the first-order factors used to indicate the teacher autonomy factor also decreased between SASS iterations.

Curiously, a large positive change in the mean difference coefficients (0.11 and 0.70 in TS99 and TS03 respectively) was observed for Factor I -- Classroom Control over Student Teaching and Assessment. Factor I is indicated by four items that measure teachers' perceptions of classroom control over selecting teaching techniques, evaluating and grading students, disciplining students, and determining the amount of homework to be assigned. Because research has repeatedly linked lower levels of student discipline incidents to lower levels of teacher attrition (Barnabe & Burns, 1994; Bobbitt et al., 1994; Brunetti, 2001; Ingersoll, 1996; Ingersoll; 2001; Liu, 2007) and because private school teachers perceived that they had higher levels of control, on average, over aspects of classroom management, including discipline, future research should focus on the possibility that public school teachers may be suffering from relatively low and decreasing levels of control over key aspects of classroom management.

Unfortunately, no distinction was made between conventional publics and public charters in the 2003-2004 SASS data sets. That fact made it impossible to compare the perceptions of conventional public to charter school teachers using the TS03. However, the comparison was possible using the TS99 because charter schools were disaggregated from conventional publics in the 1999-2000 SASS iteration. The results helped to better inform the Factor I difference between public and private teachers discussed above.

As was hypothesized, and in line with Gawlik (2007), teachers in charter schools perceived significantly higher mean levels of autonomy than did public school teachers. The difference coefficient of 0.45, and the associated effect size which indicated that the mean autonomy perceptions of charter school teachers were slightly more than half of a standard deviation greater than those of conventional public school teachers, were nearly identical to the TS99 public – private comparison statistics. Furthermore, and again similar to the results of the public – private comparison, charter school teachers were found to be significantly higher in all of the first-order factor indicators of autonomy except one, Factor I: Classroom Control over Student Teaching and Assessment.

The insignificant result was logical because it might be expected that public schools, whether conventional or charter, would have similar and more uniform polices and approaches regarding teaching techniques, evaluating and grading, student discipline, and the assignment of homework. Those results, in conjunction with findings that suggested large and significant differences between private and public teachers in the area of classroom control, engendered confidence that the SASS-STA could ferret out and explain nuanced differences between groups.

Finally, it was hypothesized that mean levels of autonomy would be hierarchically arranged with conventional public teachers perceiving the lowest levels of autonomy, public charter school teachers perceiving more autonomy, and private school teachers perceiving the highest levels of autonomy on average. Generally, that hypothesis was confirmed by findings which indicated that charter school and private school teachers enjoyed significantly higher levels of autonomy than did public school teachers. What remained to be tested was the comparison between public charters and private school teachers. As was explained earlier, that comparison was only possible using the TS99 data set.

While no significant difference in mean autonomy level was detected between the public charter and private school teacher groups, two of the three significant first-order factors were found, in line with the hypothesis, to favor private school teachers. However, charter school teachers perceived significantly higher mean levels of Schoolwide Influence over Organizational and Staff Development -- Factor II. That was an important discovery because the items used to indicate Factor II captured how much influence teachers perceived they collectively had over items closely associated with distributed leadership paradigms (e.g., teacher evaluation, hiring new full- time teachers, spending the school budget). Because charter schools are often designed around distributed leadership theory which emphasizes more discretionary power for teachers to participate in the selection of curriculum and pedagogical practices, as well as the freedom to contribute to, and participate in administrative policies and duties (Fuller, 2000, Miron & Nelson, 2002; Nathan, 1996), the finding that charter school teachers

perceived higher mean Factor II levels again bolstered faith that the SASS-STA could detect important theory supported differences between groups.

Construct Validation of the Stylized Motivating Potential of Teaching.

The Stylized Motivating Potential Score (SMPS) was estimated based on an a priori theory provided by Hackman and Oldham's (1975, 1976) Motivating Potential Score (MPS) (see Figure 8). To mimic the multiplication of teacher autonomy, feedback, and task identity in the MPS, those variables are estimated to covary in the SMPS. It is logical to suspect that those variables covary, or affect each other, because for example, if teachers' perceive low levels of autonomy they might also perceive the task of teaching to be (a) high in value because superiors reserve decisions for themselves and do not trust the judgment of subordinates, or (b) low in value because decisions are canned or made failsafe. Similar arguments can be made for other pairings of the three endogenous variables in the structural model. Additionally, and in line with Hackman and Oldham's MPS, teacher autonomy, feedback, and task significance were all theorized to directly affect the exogenous SMPS latent variable.

AMOS generated fit indices were helpful in determining SMPS model adequacy in explaining the data because fit indices are measures of residual difference between the actual covariance matrix used to analyze the data and the model implied covariance matrix. The chi-square statistic is the primary AMOS fit index used to describe the data/model fit and when significant it indicates that a difference exists between the actual data covariance matrix and the model implied covariance matrix. In other words, a significant difference in chi-square statistics suggests poor fit of the model to the data while non-significance is an indication of good fit (Kline, 2005). However, when large

sample sizes are used -- as they are in this inquiry -- small discrepancies between the actual and model implied matrices often result in significance because the chi-square test is extremely sensitive to sample size (Kline, 2005; Garson, 2012). Thus, other fit indices should be considered before a model is rejected.

The comparative fit index (CFI), goodness of fit index (GFI), normed fit index (NFI), Tucker–Lewis index (TLI), root-mean-square error of approximation (RMSEA); and the standardized root mean squared residual (SRMR) are the most often used and reported SEM fit indices (Garson, 2012; Hu & Bentler, 1999). CFI, GFI, NFI, and TLI indices can take on values from zero to one. The closer the value is to one, the better the fit of the model. By convention, values greater than .90 are considered acceptable, and values greater than .95 indicate good fit to the data (Hu & Bentler, 1999). For SRMR and RMSEA, values of .09 and .06 or less respectively reflect a good fit (Hu & Bentler, 1999).

After estimating the initial model using the entire TS99 data set (N = 46,877), it was observed that all paths were significant. That fact suggested the factors were well reflected in the indicators. However, the AMOS generated fit indices (i.e., χ^2 = 19,325.28, df = 156, p = ***; CFI, .93; GFI, .96; NFI, .93; TLI, .91; RMSEA, .05; and SRMR, .06) suggested that the fit of the model could be improved through respecification.

AMOS version 18 provides various metrics (i.e., modification indices) to suggest the type of model respecification that will reduce overall model chi-square and thus result in a better model/data fit. AMOS suggested many possible error term correlations which would have lowered the overall model chi-square, however any respecifications to allow

covariance paths between error terms must be supported by theory and/or logic and not motivated entirely by a desire to enhance model fit statistics. In accordance with the preceding, only four error term correlations were specified between the indicators of the feedback factor.

The first covariance path specified was between the error terms of the indicators: The principal lets staff members know what is expected of them, and The school administration's behaviour toward the staff is supportive and encouraging. The path was justified for at least two reasons. First, allowing the path suggested a correlation between the principal enunciating expectations to staff and the perceptions of staff that the administration is encouraging or supportive that was not fully represented in the feedback factor. Logically, the path suggests that when principals are supportive that staffers may perceive they are being apprised of expectations. Second, in this particular case, the indicators were similarly worded and directly followed each other on the questionnaire so it is possible that they shared some item-order variance. The remaining three error term correlation paths were provided for similar reasons.

After supplying the error term covariance pathways, the model was re-estimated on the TS99 data. As expected, because the sample size was so large (N = 46,877), the chi-square statistic was significant. However, the remaining fit statistics indicated adequate to good fit (i.e., CFI, .94; GFI, .96; NFI, .94; TLI, .92; RMSEA, .05; and SRMR, .06). The complete final model is shown in Figure 11.

The SMPS model was cross-validated using new data (i.e., TS03). Because the model/data fit indices suggested adequate fit at worst, and all factor loadings were significant, the model was judged to be a reliable and valid measure of the SMPS and

was accepted as the final model. The results indicated stability and thus the generalizability of the model. The cross-validated model unstandardized path coefficients and fit statistics are provided in Figure 12.

Autonomy's Impact on Teaching's Motivating Potential

Figures 11 and 12 depict the results for the final or accepted structural model representation for the Stylized Motivating Potential Score (SMPS) using the TS99 and TS03 data sets respectively. The structural portions of the models indicated that the largest effect was that of task significance, represented by the SASS item: I sometimes feel it is a waste of time to try to do my best as a teacher (Beta = -0.35 and Beta = -0.32 for the TS99 and TS03 respectively). Those results suggested that when agreement with the notion that teaching is a waste of time increases by a unit, that the SMPS is decreased by approximately one-third of a unit. In other words, the motivating potential of teaching was strongly affected by teacher attitudes regarding the importance, or as Hackman and Oldham (1974, 1975) couched it, the experienced meaningfulness of their work.

Feedback was the second strongest effect (Beta = .19 and Beta = .20 for the TS99 and TS03 respectively). That result was an indication that perceptions of feedback from agents such as principals and parents effected the motivating potential of teaching positively.

Finally, higher levels of autonomy affected the motivating potential of teaching positively in that a one unit increase in autonomy translated to a motivating potential increase of 0.14 in the TS99 and 0.17 in the TS03.The similarity of the SMPS regression coefficients observed between the TS99 and TS03 samples, suggested, at least on an anecdotal basis, stability and pointed to the generalizability of the model.

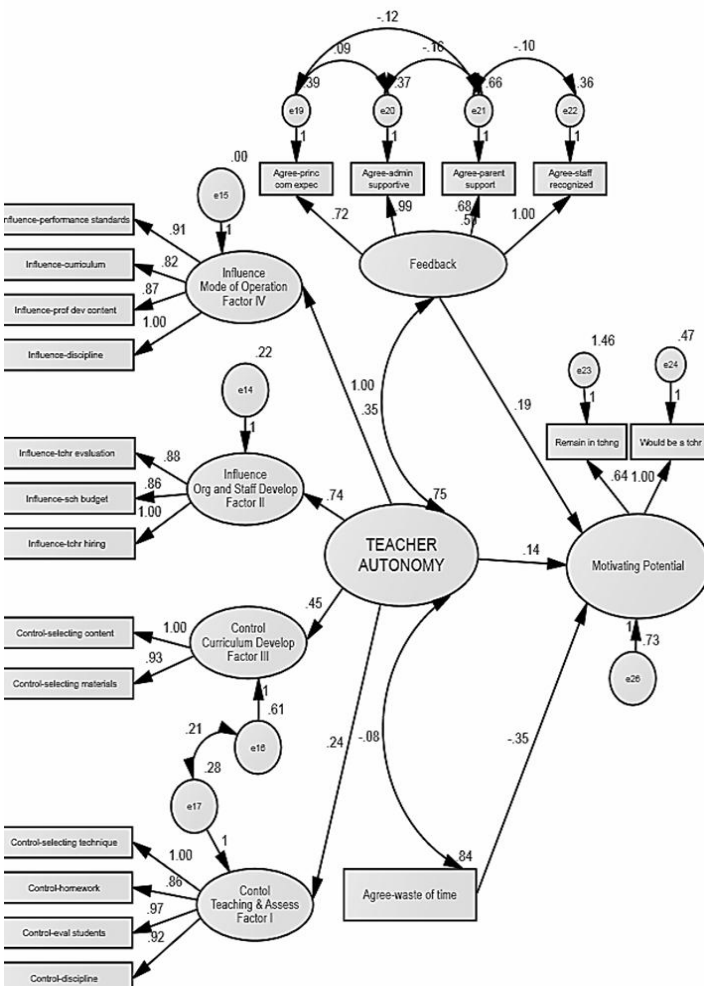


Figure 11. TS99 final Stylized Motivating Potential Score model. Unstandardized path coefficients estimated using the entire TS99 data set. χ^2 = 17,378.49 df = 152, p = ***; CFI, .94; GFI, .96; NFI, .94; TLI, .92; RMSEA, .05; and SRMR, .06.

Tables 3B1 and 3B2 of Appendix 3B contain the Stylized Motivating Potential Score (SMPS) model fit statistics for the entire TS99 and TS03 data sets respectively. In addition, each table details the particular SMPS model fit statistics for the teacher group comparison samples analyzed. Because the fit statistics for each individual teacher subgroup and the pooled comparison pair indicated that the model had adequate to good fit, the results of the SMPS path analysis were considered reliable.

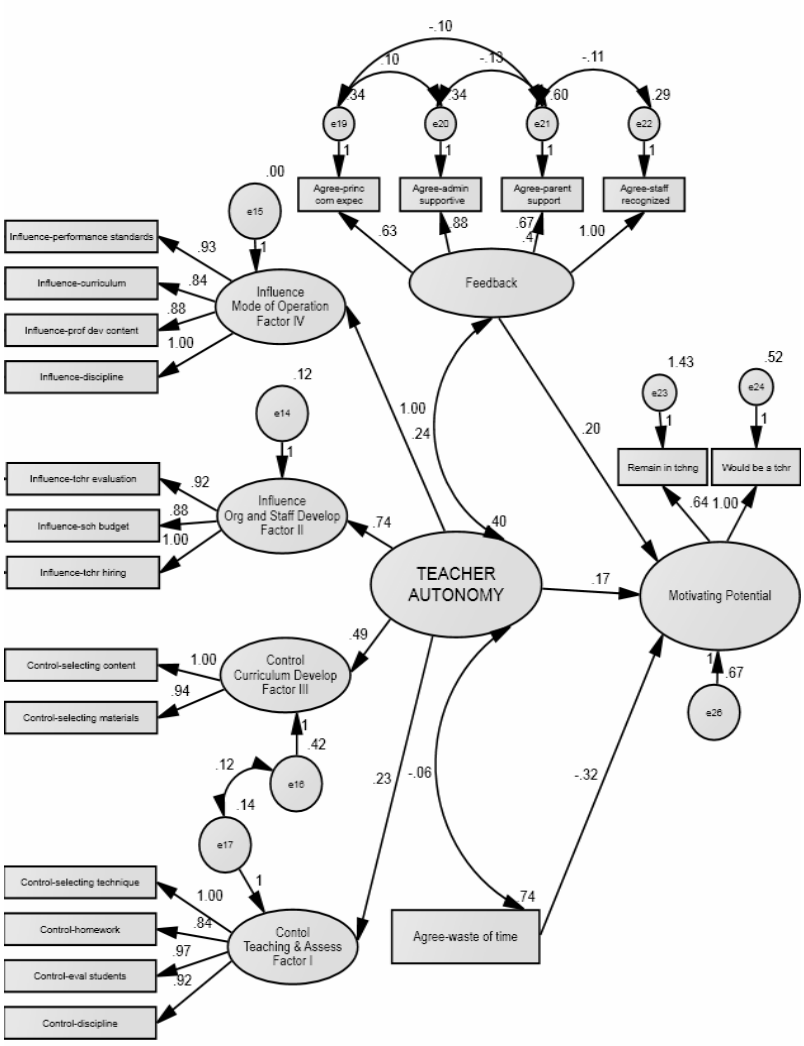


Figure 12. TS03 final Stylized Motivating Potential Score model. Unstandardized path coefficients estimated using the entire TS03 data set. χ^2 = 16,229.71 df = 152, p = ***; CFI, .94; GFI, .97; NFI, .94; TLI, .92; RMSEA, .05; and SRMR, .06.

Tables 16 and 17 contain the results for the teacher groups compared on the basis of structural model path coefficients. For each of the comparison subsamples, the structural paths that represent regression coefficients from task significance, feedback, and autonomy to the SMPS were all constrained to be equal. Then, one after the next, each of the three paths was released to be freely estimated. If the model chi-square difference was significant when a particular path was released, the path was considered to

be significantly different between the groups. If releasing a path did not cause a significant difference in the before and after overall model chi-square, the regression coefficients were considered to be statistically equal.

Setting aside for the moment the perception comparisons of public, public charter, and private school teachers, the lack of difference between paths was the most immediately noticeable characteristic of the Table 16 SASS 1999-2000 comparisons. The lack of difference between the regression coefficients suggested that the perceptions of tenured, union, and NCLB assessed regular, full-time public school teachers were no different than those of their non-tenured, non-union and non-assessed counterparts as they related to the impact of task identity, feedback, and teacher autonomy on the motivating potential of teaching.

There was however one significant result among those groups. Teacher autonomy was perceived by tenured teachers to be significantly more important to the motivating potential of teaching than it was for non-tenured teachers. This was interesting because earlier tenured teachers were found to perceive significantly lower levels of mean autonomy than did non-tenured teachers employed during the 1999-2000 school year. In combination the results suggested that, while tenured, or more experience teachers believed they had slightly less autonomy than non-tenured or less experienced teachers; it would seem that experienced teachers are motivated more by autonomy than less experienced teachers. That result may be congruent with the explanation for the lower level of mean autonomy perceived by the tenured teachers in that non-tenured or new teachers may not expect to be afforded high levels of autonomy and moreover are not motivated by autonomy because many may find comfort in being told what to do.

Table 16

Factor Loadings and Significant Differences between Paths in the Stylized Motivating Potential Score Structural Model for SASS 1999-2000 (TS99) Sub-groups

Comparison Pair	Factor/Variable	Unstandardized Regression Coefficient	SE	p
Non-Tenured -- Tenured	Teacher Autonomy	0.04	0.02	*
		(0.18) c	0.01	***
	Feedback	0.19	0.04	***
		(0.22)	0.02	***
	Task Significance	-0.36	0.02	***
		(-0.35)	0.01	***
Non-Union -- Union	Teacher Autonomy	0.17	0.02	***
		(0.15)	0.01	***
	Feedback	0.23	0.03	***
		(0.25)	0.02	***
	Task Significance	(-0.34)	0.01	***
		(-0.36)	0.01	***
Art/Music -- Math	Teacher Autonomy	0.19	0.06	***
		(0.21)	0.04	***
	Feedback	0.18	0.09	*
		(0.13)	0.07	*
	Task Significance	-0.38	0.03	***
		(-0.33)	0.02	***
Art/Music-- English	Teacher Autonomy	0.19	0.06	***
		(0.19)	0.04	***
	Feedback	0.18	0.09	*
		(0.19)	0.06	**
	Task Significance	-0.38	0.03	***
		(-0.35)	0.02	***
Public -- Private	Teacher Autonomy	0.16	0.01	***
		(0.03) c	0.02	0.13
	Feedback	0.24	0.02	***
		(0.29)	0.04	***
	Task Significance	-0.35	0.01	***
		(-0.28) c	0.02	***
Public -- Charter	Teacher Autonomy	0.16	0.01	***
		(0.08) c	0.03	**
	Feedback	0.24	0.02	***
		(0.07) c	0.05	0.18
	Task Significance	-0.35	0.01	***
		(-0.30) a	0.03	***
Charter -- Private	Teacher Autonomy	0.08	0.01	***
		(0.03)	0.02	0.13
	Feedback	0.07	0.05	0.18
		(0.29) c	0.04	***
	Task Significance	-0.30	0.03	***
		(-0.28)	0.02	***

Note. Regression weight coefficient without parenthesis is associated with the first group in the ordered comparison pair. The regression weight coefficient in parenthesis is associated with the second group in the ordered comparison pair. Ordered pairs significantly different: a = $p < .05$, b = $p < .01$, c = $p < .001$. *$p < .05$, **$p < .01$, ***$p < .001$

Table 17

Factor Loadings and Significant Differences between Paths in the Stylized Motivating Potential Score Structural Model for SASS 2003-2004 (TS03) Sub-groups

Comparison Pair	Factor/Variable	Unstandardized Regression Coefficient	SE	p
Non-Tenured -- Tenured	Teacher Autonomy	0.16	0.03	***
		(0.20) b	0.02	***
	Feedback	0.21	0.05	***
		(0.26)	0.02	***
	Task Significance	-0.31	0.02	***
		(-0.33)	0.01	***
Non-Union -- Union	Teacher Autonomy	0.22	0.02	***
		(0.18) a	0.02	***
	Feedback	0.31	0.04	***
		(0.28)	0.02	***
	Task Significance	-0.32	0.01	***
		(-0.32)	0.01	***
Math -- Art/Music	Teacher Autonomy	0.17	0.05	**
		(0.15)	0.08	*
	Feedback	0.31	0.08	***
		(0.29)	0.11	**
	Task Significance	-0.29	0.02	***
		(-0.33)	0.03	***
English -- Art/Music	Teacher Autonomy	0.31	0.05	***
		(0.15) a	0.08	*
	Feedback	0.18	0.06	**
		(0.29)	0.11	**
	Task Significance	-0.35	0.02	***
		(-0.33)	0.03	***
Public -- Private	Teacher Autonomy	0.19	0.01	***
		(0.01) c	0.03	0.73
	Feedback	0.28	0.02	***
		(0.36)	0.04	***
	Task Significance	-0.32	0.01	***
		(-0.26) c	0.02	***

Note. Regression weight coefficient without parenthesis is associated with the first group in the ordered comparison pair. The regression weight coefficient in parenthesis is associated with the second group in the ordered comparison pair. Ordered pairs significantly different: a = $p < .05$, b = $p < .01$, c = $p < .001$. *$p < .05$, **$p < .01$, ***$p < .001$

On the other hand, tenured (or more experienced) teachers may have more informed impressions of how much autonomy they need to be effective and to cope. Therefore, they are more motivated by autonomy in the workplace.

If the lack of difference between paths was the most noticeable characteristic of Table 16 then the opposite was true for 2003-2004 SASS data detailed in Table 17. All but one of the comparisons between the public school teacher groups (i.e., tenured vs. non-tenured, union vs. non-union, and NCLB assessed vs. non-assessed) suggested that the only significant difference was in the autonomy – SMPS path. Those results were anecdotally interpreted as an indication that autonomy may have become more important to the motivating potential of teaching over the four years between SASS iterations.

Tenured vs. Non-tenured

Autonomy was significantly more important to the motivating potential of tenured teachers than it was for non-tenured teachers in the TS99 sample and, lending credence to the reliability and validity of the model, the same result was observed for teachers employed during the 2003-2004 school year. However, the difference between the 2003-2004 tenured and non-tenured teachers (i.e., Beta = 0.20 and Beta = 0.16 respectively) was so much less than the difference observed between the same 1999-2000 teacher groups (i.e., Beta = 0.18 and Beta = 0.04) that the difference was likely not only due to the difference in Likert scales.

In theory, curriculum narrowing and/or practice prescriptions would have affected the teachers in the 2003-2004 sample, including those who were less experienced or non-tenured, more than those employed during 1999-2000 before NCLB was implemented. Therefore, because autonomy related concerns (e.g., curriculum narrowing, curriculum

prescription) may have intensified after NCLB's implementation, it is reasonable to assume that autonomy would play a larger role in the motivating potential of teaching for those in the TS03. That notion was supported by union – non-union observations.

Union vs. Non-union

No significant difference was observed between the autonomy regression path coefficients of union members and those who had not joined unions in the TS99 samples (i.e., Beta = 0.15 and Beta = 0.17 respectively). However, in the ensuing four years, the difference in the autonomy paths widened to the point of significance, and as they did in the case of the tenured – non-tenured samples, the regression coefficients increased for the union – non-union groups (i.e., 0.18 and 0.22 respectively). While the increase in the regression coefficients from the TS99 to TS03 was not as pronounced as it was in the tenured - non-tenured samples, the fact that the coefficients increased for both groups again suggested that autonomy may have begun to play a larger role in the motivating potential of teaching after NCLB's implementation.

NCLB Assessed vs. Non-assessed

Earlier it was found that public secondary math and ELA teachers perceived significantly lower mean autonomy levels than their art/music colleagues in both the TS99 and TS03 samples. However, those mean autonomy level differences only translated to a significant autonomy – SMPS regression path difference for teachers employed as ELA and art/music teachers during the 2003-2004 school year. In other words, even though teachers of NCLB assessed disciplines perceived significantly lower mean levels of autonomy than their non-assessed colleagues, those differences made no real difference in the relationship of autonomy and SMPS for the teachers sampled during

the 1999-2000 school year or for teachers of math and art/music sampled during the 2003-2004 school year.

This was a rather unexpected result because while there were at times large differences in mean levels of autonomy between the assessed and non-assessed teacher samples, it appeared that only in the TS03 ELA – art/music teacher comparison did the mean difference translate into a significant relationship dissimilarity between autonomy and the motivating potential of teaching. On one hand, the finding that the ELA – art/music SMPS autonomy path changed from non-significant in the TS99 samples to significant in the TS03 samples supported the theory that NCLB may have had a hand in increasing autonomy's impact on teaching's motivating potential. Especially since for the ELA instructors, the regression coefficient was double that of the art/music teachers (i.e., Beta = 0.31 and Beta = 0.15 respectively). On the other hand, the hypothesis that NCLB could have played a part in decreasing the motivating potential of teaching for teachers of assessed disciplines was weakened in a substantial way because no significant difference was found in the autonomy path coefficients for three of the four assessed – non-assessed comparison samples, including the TS03 math – art/music samples which were found to have a large difference in mean autonomy level. Furthermore, if the significant TS03 ELA – art/music autonomy path finding could be attributed to type I error, then the theory that NCLB may be a catalyst in strengthening autonomy's impact on the motivating potential of teaching would be further diminished.

Public vs. Charter, Private

Previously, some of the most dramatic mean autonomy level differences were discovered between conventional public and public charter, and public and private school

teachers. So when those groups were examined using the SMPS structural model, it was not surprising to see multiple and significant differences. In fact, the public – private comparison samples in both SASS iterations, and the public – public charter comparison samples of the TS99 were the only pairings to indicate significant differences in all three structural paths.

In the 1999-2000 teacher samples, the findings indicated that for every one unit increase in autonomy that the motivating potential of teaching increased by 0.16 units for public school teachers, 0.03 units for the private school teachers, and 0.08 units for teachers that were employed in charter schools. Those findings were echoed for public – private teachers employed during 2003-2004. For every one unit increase in autonomy the motivating potential of teaching for public school teachers increased by 0.19 units, and 0.01 units for the private school teachers.

The findings made clear that autonomy played a much larger role in the motivating potential of public school teachers than for teachers who worked in private schools or public charters. Furthermore, coincidently or otherwise, autonomy appeared to grow in its importance among public school teachers in the years following the implementation of No Child Left Behind.

Discussion/Conclusion

While the SASS-STA was previously shown to be valid and reliable (Gwaltney, 2012b), its value to predict and describe what it was created to measure was previously untested. Hence, to assess the value of the construct, and because validation is a continuing process, this inquiry was interested in whether the SASS-STA: (a) would demonstrate a stable factor structure using much smaller sub-samples of the SASS data

sets, (b) could detect mean differences in teacher autonomy that theory suggests should be present between particular groups that are differently affected by policy, (c) could explain the nuances of autonomy differences detected, and (d) could be successfully integrated into larger models to explore and describe pressing issues like teacher attrition and job satisfaction and in this case, teaching's motivating potential. The findings of this inquiry demonstrated that the SASS-STA passed each of those tests.

The results of the mean structural analysis were convincing in reaching the conclusion that the SASS-STA could in fact detect mean autonomy differences in accordance with previous research and with the logical effects of policy. What is more was the discovery that the construct could explain autonomy differences in terms of the specific consequential productive activities that teachers perform in schools. Taken together, those conclusions suggested the model was valid and reliable.

The SASS-STA successfully represented teacher autonomy in the Stylized Motivating Potential Score (SMPS) structural model to explore autonomy's role in teaching's motivating potential. Overall, the TS99 comparisons suggested that the perceptions of tenured, union, and NCLB assessed regular full-time public school teachers were no different than those of their non-tenured, non-union and non-assessed counterparts as they related to the impact of task identity, feedback, and autonomy on the motivating potential of teaching. However, in nearly every regression path comparison between the same public school teacher groups in the TS03 data set, the one and only significant difference was in the autonomy – SMPS path. That finding supported the contention that autonomy's impact on teaching's motivation potential had become a larger concern for public school teachers since NCLB was implemented

One of the most intriguing discoveries was that even when large differences in mean autonomy levels were found, that the difference did not always mean that autonomy affected the SMPS of the more autonomous teachers any more or less than the SMPS of the teachers who perceived less autonomy. For example, the greatest difference in mean autonomy levels were observed between art/music and mathematics teachers employed during the 2003-2004 school year. However, no significant differences were observed for autonomy's impact on SMPS between the two groups. So while art/music teachers perceived much higher levels of autonomy than did the math teachers, autonomy did not seem to impact teaching's motivating potential for art/music teaches any more or less than math teachers. In another instance, teacher autonomy was perceived by tenured teachers to be more important to the motivating potential of teaching than it was for non-tenured teachers even while tenured teachers perceived lower mean levels of autonomy than non-tenured teachers. Results of that type suggested that constructs like task identity, feedback, and autonomy play unique and disparate roles in teaching's motivating potential for particular groups of teachers, providing an interesting insight for future inquiry.

The most convincing support for the contention that autonomy's impact on teaching's motivation potential had become a larger concern for public school teachers since NCLB was implemented was found in the analysis of the 2003-2004 SASS data. In nearly every regression path comparison between the public school teacher groups (i.e., tenured vs. non-tenured, union vs. non-union, and NCLB assessed vs. non-assessed) the one and only significant difference was in the autonomy – SMPS path.

The principal strength of the SASS-STA is that it was developed using the nationally representative Schools and Staffing Survey (SASS). The SASS data sets are so large that an adequate number of cases could be extracted for nearly any teacher subset, an advantage that allowed this inquiry to address: (a) the sample size problems that have limited previous efforts and (b) teacher subgroup comparisons that was heretofore impossible. The ability to use SASS data sets in the SASS-STA is a tremendous asset for future research because unlike other autonomy constructs, adequate samples sizes of particular teacher groups can be extracted for analysis.

Research has suggested that several groups of teachers (e.g., teachers who work in urban schools, teachers who work in small private schools, teachers with higher skill levels, new teachers, special education teachers) suffer disproportionately high attrition rates (Ingersoll, 2001, 2002a) and lower levels of autonomy in particular aspects of teacher work have been found to be related to job separation (Crocco & Costigan, 2007; Ingersoll, 1996; Liu, 2007). So we would expect to see lower relative levels of autonomy in groups that suffer higher rates of attrition. In fact, because this inquiry found that mathematics teachers -- a group that has relatively high attrition rates (Ingersoll, 2001, 2002a, 2002b; Rumberger, 1987) -- did have lower levels of autonomy than art/music teachers, that supposition was encouraged. Therefore, future research efforts designed to examine the relationship between autonomy and attrition in at-risk teachers groups have great potential to inform policy and influence administrative practice.

While the use of the SASS offers tremendous advantages; there are troublesome and significant shortcomings. Only 13 in-common 1999-2000 and 2003-2004 SASS items were authenticated as indicators of teacher autonomy (Gwaltney, 2012b). In

comparison, Friedman (1999) developed some 32 custom autonomy indicators in his Teacher Work-Autonomy (TWA) scale, one of the most comprehensive teacher autonomy constructs uncovered by this inquiry. The disparity of indicators between the SASS-STA and the TWA demonstrates a SASS-STA limitation, the non-existence of SASS items to indicate all aspects of teacher autonomy.

Case in point, while sorting is among the most consequential duties performed by teachers because it is instrumental in the production of future citizens and the reproduction of the prevailing social order (Ingersoll, 1996), the SASS iterations used for this inquiry did not contain suitable items to capture the sorting function. In other words, the SASS-STA as it is now configured cannot detect teacher perceptions of autonomy over student sorting. So while the SASS-STA demonstrated great reliability in the accurate and consistent prediction of autonomy differences -- and displayed the sensitivity needed to explain many of those differences -- the absence of SASS items to indicate all aspects of teacher autonomy is a clear SASS-STA limitation.

Another limitation was the non-existence of SASS items to gauge teacher perceptions of policy intensity. In other words, no items were available to assess the degree to which teachers believed that, for example, No Child Left Behind had affected their freedom, independence, control, discretion, or influence over consequential productive school activities. Therefore, speculations that findings were influenced by any particular policy or policies are purely logic driven and not related to empirical outcomes.

A particularly annoying shortcoming of using SASS items is inconsistency between SASS iterations. Mismatched Likert scales (i.e., 1 to 5 in the TS99 and 1 to 4 in the TS03) for the SASS-STA indicators made direct comparisons between teachers

employed during the 1999-2000 school year and teachers employed during 2003-2004 inadvisable using AMOS version 18. Furthermore, several of the SASS-STA indicators were not included in the 2007-2008 SASS which prohibited the inclusion of the latest SASS iteration.

In conclusion, this inquiry found autonomy differences between groups of teachers that were theorized to be more or less affected by particular policies and reinforced previous efforts that have found autonomy matters to teaching's motivating potential. Because autonomy is closely associated with the job satisfaction of teachers (Cohrs et al, 2006; Kreis & Young Brockopp, 2001; Pearson & Hall, 1993; Pearson & Moomaw, 2005; Ingersoll, 1997a, 1997b; Quiocho & Stall, 2008). The findings have implications for policy makers and educational leaders who wish to improve their organizations.

Teacher autonomy has been associated with staff participation in decision-making and increases in employee autonomy are associated with improved organizational efficiency (Conley, Schmidle & Shedd, 1988; Conway, 1984; Luthans, 1992; Morgan, 1997; Smylie, 1992). In fact, flatter more decentralized schools with less centralized authority configurations like the structures found in charter schools, have been found to perform better than traditional top-down bureaucratic structures (Blasé & Blasé, 1996; Morgan, 1997). Moreover, when employees participate in and have greater power over decision-making, the result has been increased professional autonomy (Bryk, Sebring, Kerbow, Rollow, & Easton, 1998; Fuller, 2000). Taken together, it is fair to assert that workplace autonomy is beneficial for the professional lives of individual teachers and for the schools that employ them. Therefore, educational leaders and policy makers should

take steps to maximize teacher autonomy, or least maximizes teacher perceptions of autonomy.

This inquiry confirmed previous research findings and extended the literature by examining, for the first time, large samples of teachers grouped by how they are theoretically affected by policy. The results suggested that teachers differ in their levels of and reactions to autonomy and that teacher autonomy levels can be predicted by considering policy.

Chapter 5: Results and Conclusions

Increasingly policy makers and patrons alike see public school organizations in the United States as being far too "loosely-coupled" (Weick, 1976) -- a situation that they contend has contributed to ineffectiveness, disorder, and inefficiency (Ingersoll, 1996, 2007). This in part may explain why the American mindset has changed over time to favor increasing levels of federal and state influence over their local education agencies. This shift has led to increased performance standards, national curriculums, strident accountability paradigms, and top-down control over teachers and teaching to improve student achievement (Wirt & Kirst, 2005). However, tightly controlling schools is in direct contradiction of research which suggests that more decentralized schools achieve better than those with traditional top-down bureaucratic arrangements (Blasé & Blasé, 1996). This may be so in part because decentralized authority structures would logically support higher levels of teacher autonomy.

Theory posits autonomy as essential in the private lives of individuals (Maslow, 1943; Porter, 1963), important to the job satisfaction of workers (Herzberg et al., 1959), and indispensable to street-level-bureaucrats like teachers if they are to function optimally in their roles as dispensers of public policy (Lipsky, 1980). Those assertions are supported by empirical studies which have found that teacher autonomy or teacher autonomy elements: (a) decrease stress and increase satisfaction, empowerment, and professionalism (Barnabe & Burns, 1994; Cohrs et al., 2006; Kreis & Young Brockopp, 2001; Pearson & Moomaw, 2005, 2006), (b) dramatically decrease the probability that first-year teachers will leave teaching (Liu, 2007), and (c) diminish the number of student

misbehavior incidents and improve relationships among staff (Ingersoll, 1996). Given the apparent importance of teacher autonomy, both from the perspectives of teachers and of their organizations, it is surprising that the subject has received so little consideration in educational inquiry.

To address the lack of teacher autonomy research, the chapters of this effort have established new tools for research and the application of those tools have resulted in important research findings. Prior to the development of Gwaltney's (2012a) programmatic teacher autonomy definition, there was no consensus within the research community as to what teacher autonomy should mean. That situation generated nearly as many teacher autonomy definitions as there are studies that have examined it. The number of and disparate nature of conceptualizations has provided justification to question whether research is actually capturing teacher autonomy. Therefore, the establishment of a standard and uniquely meaningful definition was important so that research can benefit from a common benchmark.

The definition's importance as a benchmark was made immediately apparent in chapter three when justification for selecting potential indicators for a new teacher autonomy construct was required. Gwaltney's standard definition was indispensible in selecting items from the Department of Education's National Center for Education Statistics Schools and Staffing Survey (SASS).

While validating the Schools and Staffing Survey - Scale for Teacher Autonomy (SASS-STA) was the primary purpose of the chapter three, interesting measurement invariance/variance findings between particular teacher subgroups both reinforced and challenged the results of past efforts. Those discoveries were exciting because they hinted

that the ultimate motivation, the ability to examine, compare, and describe the autonomy levels of interesting teacher groups that was heretofore impossible due to data limitations, may indeed be plausible.

The forth chapter focused on testing the utility of the SASS-STA to do what it was designed to do, measure, describe, and represent teacher autonomy. Of particular note was the finding that high school teachers of disciplines that are specifically assessed under No Child Left Behind (i.e., mathematics and English/language arts) had lower levels of autonomy than teachers of non-assessed disciplines (i.e., art/music) (Gwaltney, 2012c). That result affirmed research that has suggested practice prescriptions inspired by NCLB accountability policies may adversely affect the autonomy of math and English/language arts teachers (Crocco & Costigan, 2007; Day, 2002; Mathison & Freeman, 2003; Ogawa et al., 2003; Quiocho & Stall, 2008). The SASS-STA also effectively represented teacher autonomy in an adaptation of Hackman and Oldham's (1975) Motivating Potential Score; demonstrating that the model could serve as a valid teacher autonomy construct in larger empirical models.

Chapter 2: Autonomy: Developing a Programmatic Definition for Teaching

Chapter two addressed the need for a standard understanding of teacher autonomy and thus a *programmatic* definition was formulated. By blending stipulative definitions (i.e., definitions invented by their authors) and descriptive definitions (i.e., dictionary definitions that describe the defined term or the way the word is used) programmatic definitions convey how a concept *ought* to be defined (Scheffler, 1960).

The programmatic definition was created by examining, incorporating, and integrating: (a) semantic relationships among the key words represented explicitly or

implicitly in the Merriam-Webster's on-line descriptive dictionary definition of autonomy, (b) stipulative autonomy and teacher autonomy definitions used in previous research efforts, (c) significant processes and activities that teachers perform in schools, and (d) the workplace contexts where teachers can appropriately and/or potentially exercise autonomy. The final formulation suggests that teacher autonomy is: the degree to which teaching provides substantial freedom, independence, power, and discretion to participate in scheduling, selecting, and executing administrative, instructional, and socialization and sorting activities both in the classroom and in the school organization at large (Gwaltney, 2012a).

The definition supports a complex multi-dimensional concept of teacher autonomy that is more than the sum of its parts. It suggests that teacher autonomy items must contain specific key words (e.g., influence, control, discretion, freedom, power, independence) and speak to the consequential productive activities that teachers perform in schools. Because of its specificity, the definition can serve as a tool to assist researchers in the creation or identification of autonomy indicators. It is fair to say that the definition informs a unique understanding of what teacher autonomy is and what it is not.

Chapter 3: Initial Construct Validation of the Schools and Staffing Survey Scale for Teacher Autonomy (SASS-STA)

The utility of Gwaltney's (2012a) teacher autonomy definition was made immediately apparent when it was used as one of the benchmarks by which individual SASS items were selected as potential SASS-STA indicators. First, in-common survey items were identified in the 1999-2000 and 2003-2004 SASS Teacher Questionnaires that

included the key words and consequential productive activities included in the definition. Then the potential indicators were compared to the teacher autonomy items established in past investigations and especially to those of the most comprehensive construct uncovered by this study, Friedman's (1999) Teacher Work Autonomy Scale (TWA). The TWA was considered to be the quintessential test of construct validity because its many indicators were derived using the perceptions of what teachers themselves said best defined autonomous behavior.

Chapter three hypothesized that the factors extracted from the SASS indictors would resemble the teacher autonomy factors found in the literature, teacher autonomy would be best modeled by a second-order factor structure, and that the model would generalize across appropriate teacher groups. Each was realized in whole or in part.

Factor analysis produced four first-order factors that were shown to be similar to the factors of previous studies (i.e., Friedman (1999); Pearson & Hall (1993)) and structural equation model testing confirmed that teacher autonomy can be modeled as a second-order latent factor. Then because reliability is a function of sample, the SASS-STA model was evaluated on samples from the intended target population (Dawis, 1987).

Reliability was reinforced when measurement invariance was found for new male and new female teachers. This was a logical outcome because, in theory, new teachers should share similar levels of autonomy because they will have had insufficient opportunities to develop the fully informed workplace impressions of their more experienced colleagues. Moreover, questions regarding the definition of autonomy that may have occurred over the time period between the SASS iterations were justified because new male and new female teachers were the only groups to display measurement

invariance in the 2003-2004 SASS; when in comparison several teacher group comparisons displayed invariance in the 1999-2000 SASS.

Valid measurement constructs are based on theories which are underpinned by clear operational definitions involving measurable indicators (Garson, 2011). The benchmarks employed by this inquiry insured that both were true of the SASS-STA. In the end, the inquiry contributed what it set out to contribute, a valid and reliable teacher autonomy construct derived using national data. That fact promises generalizability of results on a vast array of important and pressing research questions including whether and why autonomy levels differ among select teacher groups.

Chapter 4: Teacher Autonomy: Using the SASS-STA to Examine Groups Targeted by Policy

The SASS-STA was shown to be valid and reliable (Gwaltney, 2012b), however its value in predicting and describing what it was created to measure, specifically the workplace autonomy of teachers, was previously untested. So to assess the construct, and because validation is a continuing process, chapter 4 focused on whether the SASS-STA: (a) would demonstrate a stable factor structure using much smaller sub-samples, (b) could detect mean differences in teacher autonomy that theory suggests should be present between particular groups that are differently affected by policy, (c) could explain the nuances of any autonomy differences detected, and (d) could be integrated into larger models to investigate the role of autonomy in larger constructs. The findings demonstrated that the model passed each of those tests.

The SASS-STA demonstrated a stable factor structure. Model fit indices indicated adequate to good model/data fit for all of the teacher subgroups examined using much

smaller sub-samples of the 1999-2000 and 2003-2004 SASS data sets. Those results suggested that the model generalized across groups which implied that mean structural analysis could be used explore mean autonomy differences.

Contrary to one of the hypothesized outcomes, non-tenured teachers perceived slightly higher levels of autonomy than teachers who had achieved tenure even though tenured teachers enjoy significant legal protections that are theorized to augment autonomy. An explanation for the finding posited that the tenured, or more experienced teachers, may have had better understandings of exactly how much autonomy the workplace will allow and thus perceived lower levels of autonomy than less experienced, but more idealistic, non-tenured teachers.

No significant mean difference was found in the perceived autonomy levels of unionized public school teachers and non-members in either SASS iteration even though theory would suggest that union members should perceive higher levels of autonomy due to collective bargaining benefits. That finding was attributed to the possibility that many union benefits (e.g., job security guarantees, favorable evaluation paradigms) accrue to most public school teachers whether they are union members are not.

Secondary teachers of NCLB assessed disciplines (i.e., mathematics and English/language arts (ELA)) perceived lower levels of perceived autonomy than groups of secondary teachers of subject matters that are not assessed (i.e., art/music). For all of the comparison pairs, in both samples, the subsamples of non-assessed teachers were consistently found to have significantly higher mean levels of perceived autonomy than did the teachers of assessed subject matters. The consistency of those findings again suggested model reliability. Additionally, model sensitivity was indicated when the

difference between the assessed and non-assessed groups narrowed in the case of the ELA and art/music teachers, and widened in the case of the teachers of math and art/music in the four year period between SASS iterations. That finding suggested, in line with the literature, that curriculum narrowing and practice prescription may have affected math teachers more than ELA teachers. The analysis of the first-order factors seemed to support that contention.

In direct comparisons between the mathematics and ELA teachers, no difference was found in the autonomy factor. However the math teachers perceived less control over curriculum related items like textbooks/instructional materials and content, topics, and skills to be taught. That finding strongly insinuated that the math teachers experienced more curriculum narrowing and practice prescription than the ELA teachers. Furthermore, mathematics teachers perceived even less control over curriculum related aspects than their ELA colleagues after NCLB was implemented. In sum then, the analysis of the mean autonomy differences between teachers of NCLB assessed and non-assessed disciplines supported Crocco and Costigan (2007) and Manzo (2005) who suggest that curriculum narrowing adversely affects teacher autonomy and that NCLB may have had made practice prescriptions even worse for particular groups of teachers.

The supposition that public school teachers would perceive the lowest levels of autonomy, public charter school teachers would perceive more autonomy than public school teachers, and that private school teachers would perceive the highest levels of autonomy was generally confirmed. However, no significant difference in mean autonomy level was detected between public charter and private school teachers.

Charter school teachers did however perceive significantly higher mean levels of Schoolwide Influence over Organizational and Staff Development -- Factor II than did private school teachers. That was an interesting and important discovery because the items used to indicate Factor II captured how much influence the teachers perceived they collectively had over more administrative duties such as teacher evaluation, hiring new full- time teachers, and spending the school budget. Because charter schools are often designed around distributed leadership theory which emphasizes affording teachers more discretionary power to contribute to, and participate in organizational governance (Fuller, 2000, Miron & Nelson, 2002; Nathan, 1996) the finding reinforced the contention that that the SASS-STA could successfully detect small but important distinctions between teacher groups.

Other important group distinctions were highlighted as well. Mean differences in Factor I, Classroom Control over Student Teaching and Assessment, between private school and public school teachers indicated that the private school teachers perceived higher levels of control or discretion over items like selecting teaching techniques, evaluating and grading students, disciplining students, and determining the amount of homework assigned. What is more is that the difference appeared to increase over the four year period between SASS iterations. Even though it was an anecdotal observation, it was viewed as a logical outcome if one accepts that practice prescriptions may have had a larger impact on public school teachers after NCLB implementation.

Charter school teachers were found to be significantly higher in all of the first-order factors than their conventional public colleagues except one, Factor I -- Classroom Control over Student Teaching and Assessment. That was interpreted as accurate because

it might be expected that public schools, whether conventional or charter, would have similar polices and approaches regarding evaluating and grading, student discipline, and the assignment of homework to comply with district policy and public school law. Taken together, findings like those just discussed suggested that the SASS-STA was sensitive enough to ferret out and explain nuanced differences between groups.

One of the most salient reasons for creating the SASS-STA was to investigate the role of teacher autonomy in larger theoretical models. To explore that possibility, the SASS-STA was integrated into a stylized model that was designed to mimic Hackman and Oldham's (1976) Motivating Potential Score. One of the most intriguing discoveries was that even when large group differences in mean autonomy levels were observed, the difference did not always mean that autonomy impacted the motivating potential of teaching of the more autonomous teachers any more or less than teachers who perceived less autonomy. For example, while art/music teachers perceived much higher levels of autonomy than did the math teachers, autonomy did not contribute to the motivating potential of teaching for the art/music teaches any more or less than for the math teachers.

Overall, the SASS 1999-2000 comparisons suggested that the perceptions of tenured, union, and NCLB assessed public school teachers were no different than those of their non-tenured, non-union and non-assessed counterparts as they related to the impact of autonomy on the motivating potential of teaching. However, support for the contention that autonomy's impact on teaching motivation had become a larger concern for public school teachers since the implementation of NCLB was found in the analysis of the 2003-2004 SASS data. In nearly every regression path comparison between the public school

teacher groups, the one and only significant difference was in the autonomy – motivating potential pathway.

The results indicated that autonomy impacted the motivating potential of teaching for public school teachers much more than private or charter school teachers. That finding hinted at the possibility that private and charter school teachers were much less impacted by practice prescription and/or curriculum narrowing. In addition, because private and charter school teachers were found to have so much more influence, discretion, and control over school policy matters than their counterparts in public schools, they may have taken workplace autonomy as a given.

That explanation was congruent with research that suggests both charter and private school teachers have greater autonomy levels than public school teachers (Chubb & Moe, 1990; Gawlik, 2007). Furthermore, coincidently or otherwise, autonomy appeared to grow in its importance to the motivating potential of teaching for public school teachers in the years following the implementation of NCLB.

Research has suggested that several groups of teachers (e.g., teachers who work in urban schools, teachers who work in small private schools, teachers with higher skill levels, new teachers, special education teachers) suffer disproportionately high attrition rates (Ingersoll, 2001, 2002a) and lower levels of autonomy in particular aspects of teacher work have been found to be related to job separation (Crocco & Costigan, 2007; Ingersoll, 1996; Liu, 2007). With the preceding in mind, we would expect to see lower relative levels of autonomy in groups that suffer higher rates of attrition. In fact, that supposition was encouraged when mathematics teachers – a group that suffers relatively high attrition rates (Ingersoll, 2001, 2002a, 2002b; Rumberger, 1987) – were found to

have lower levels of autonomy than art/music teachers. Findings like those highlight the possibility that teachers who are members of high attrition rate groups will exhibit lower levels of autonomy. This is an important question for future research because if low autonomy levels are common in at-risk groups, the findings may have great potential to inform policy and influence administrative practice.

SASS-STA Strengths and Weaknesses

The principal strength of the SASS-STA is that it was developed using the Schools and Staffing Survey (SASS) items. SASS data compatibility allowed this inquiry to address the sample size and generalizability problems that have limited previous efforts. Moreover, the SASS data sets were so large that an adequate number of cases could be extracted for nearly any teacher subset, an advantage that allowed teacher groups comparisons that were heretofore impossible.

While the use of SASS data clearly offers tremendous advantages, there are drawbacks as well. The SASS-STA uses 13 indicators. In comparison, Friedman (1999) employed some 32 custom autonomy items in the TWA. The smaller number of SASS-STA indicators makes the SASS-STA less sensitive than the TWA. For example, there were no suitable items to capture the sorting function that teachers perform in schools which is instrumental in the production of future citizens and the reproduction of the prevailing social order (Ingersoll, 1996). So while the SASS-STA demonstrated great reliability in the accurate and consistent prediction of autonomy differences -- and displayed the sensitivity needed to explain most of those differences -- the SASS-STA cannot explain all aspects of autonomy due to the absence of SASS items to indicate key aspects of teacher autonomy.

In addition, irritating difficulties were caused by item consistency between SASS iterations. Mismatched Likert scales precluded direct comparisons between teachers employed during 1999-2000 and teachers employed during 2003-2004. Furthermore, because several SASS-STA indicators were not included in the 2007-2008 SASS, trend analysis was degraded. For those reasons, the author respectfully requests that the National Center for Educational Statistics restore all of the items used in the SASS-STA to future SASS Teacher Questionnaires and that it limit or prohibit changes to items between iterations.

Conclusion

The importance of autonomy has been made clear in the chapters of this effort. Theorists have long described autonomy as essential in the private lives of individuals (Maslow, 1943; Porter, 1963) and indispensable to teachers if they are to be satisfied and function optimally in their roles as dispensers of public policy (Herzberg et al., 1959; Lipsky, 1980). Research has backed theory with findings that suggest that teacher autonomy or elements thereof: (a) increase satisfaction, empowerment, and professionalism and decrease stress (Barnabe & Burns, 1994; Cohrs et al., 2006; Kreis & Young Brockopp, 2001; Pearson & Moomaw, 2006), (b) significantly diminish the probability of first-year teacher attrition (Liu, 2007), and (c) reduce student discipline incidents and improve staff relationships (Ingersoll, 1996). However, an important wrinkle has not yet been considered. The possibility that teachers expect autonomy because they are socialized to believe they are professionals.

During training, pre-service teachers often hear *profession* associated with teaching and *professional* used in reference to teachers. Moreover, when they enter

teaching they are constantly exposed to words and phrases like professional development, professionalism, professional learning communities, and professional commitment. Hence, it is fair to assume that teachers believe themselves to be professionals.

While there is much controversy concerning what constitutes a profession, functionalists describe profession in terms of structural characteristics and the professional in terms of attitudinal traits (Krejsler, 2005). Hall (1969) characterized a profession by the fact that: (a) its knowledge and practice are based on systematized theory, (b) the professional has authority in the sense that she/he knows best about his/her field, (c) the professionals exercise formal as well as informal control over the development of knowledge within their field and over education of future professionals, (d) the profession is guided by an ethics that regulate relations between colleagues and with clients, and (e) its members understand themselves within a comprehensive professional culture of common norms, symbols, and language (Hall, 1969).

Hall characterized the professional by attitudinal traits, such as: personal commitment, the wish to carry out professional tasks as well as possible, not being primarily motivated by money, having an affiliation with his/her colleagues, which contributes to a common identity that is developed and maintained through formal and informal associations, and maybe most importantly, a wish and demand for professional autonomy. From Hall's point of view, lawyers, medical doctors, and the priest's are examples of true professions (Hall, 1969, pp. 73 –90).

In relation to the above described criteria, many believe that teachers fall short of true professional status. Krejsler (2005) suggested that teachers have had difficulties in: (a) possessing an unquestioned position in relation to their field, (b) convincing the public

that they possess and have privileged access to an indispensable body of knowledge, (c) persuading society that an unquestionable prerequisite for practice is their education because it is not evident that here is a scientific basis for teaching, and (d) providing evidence that teachers possess a common scientifically based language which they use to communicate about professional practice and grow knowledge and skills. Most importantly, there is much controversy around whether teachers can be said to possess professional autonomy in relation to the exercise of their practice. On that point Krejsler (2005) asserted that teachers have only negligible influence within a framework that is largely subservient to bureaucratically regulated administration. When one considerers the consequences of recent accountability policies in education, Krejsler's assertion appears to be accurate.

We have seen that teachers of disciplines that are assessed by standardized tests and/or teachers that work in schools that have been identified as failing are more like to experience practice prescription and curriculum narrowing (Crocco & Costigan, 2007; Ogawa, et al., 2003) whether they believe it is best for their students or not. Those findings were reinforced by chapter 4 where it was found that mathematics and English - language arts teachers, who are frequently subject to practice prescriptions, had much lower levels of autonomy than art/music teachers who were theorized to be less bothered by outside interference (Gwaltney, 2012c). The apparent propensity of school officials to intervene in the practice decisions of teachers stands in stark contrast to the doctor's autonomy in choosing the best course of treatment for his/her patient, suggesting that teachers probably do not possess autonomy levels that are comparable to those of true professionals.

Considering the previous arguments, if it is fair to say that new teachers emerge from training with an expectation of professional autonomy, and if they find their true autonomy levels to be disappointing, they may quickly become disillusioned and dissatisfied with teaching. Research supports that supposition. We have seen that low teacher autonomy levels are generally correlated with workplace negatives including lower levels of job satisfaction, empowerment, and professionalism (Barnabe & Burns, 1994; Cohrs et al., 2006; Kreis & Young Brockopp, 2001; Pearson & Moomaw, 2006) and that nearly 50 percent of new teachers leave the profession within the first five years (Chase, 2000; Ingersoll, 2001; Ingersoll, 2002a, Nobscot, 2004). Therefore there is no question but that teacher autonomy is an important area for future research. In particular, questions surrounding the autonomy expectations of future teachers should be addressed so that training curriculums and induction programs can inculcate understandings that are more congruent with reality.

The inquiries of this effort accomplished its stated goals. First, it established a research standard by developing an autonomy definition that is uniquely tailored for teaching. Second, the SASS-STA was developed and validated to facilitate empirical research. Finally, the measurement model was used to successfully predict and explain autonomy differences and to represent teacher autonomy in larger empirical models.

The SASS-STA is unique among teacher autonomy constructs because it is underpinned by a clear operational definition, based upon measurable indicators (Garson, 2011; Gwaltney, 2012a, 2012b), and was derived using the largest most extensive data source available -- the U.S. Department of Education's National Center for Education Statistics Schools and Staffing Survey. The use of this tremendous resource has imparted

an extremely valuable quality to the SASS-STA – generalizability. Generalizability in concert with the rich variety of items contained in the SASS and in the Teacher Follow-up Survey promise copious opportunities to explore important leadership, organizational, and occupational questions as they relate to teachers and teaching.

Appendix 3A

Table 3A1

Autonomy Indicators Used in Category I Studies Classified by Friedman (1999) Factor

Category I: Friedman (1999)

Indicator Item	Factor I	Factor II	Factor III	Factor IV	SWZ	CRZ
1. Teachers establish student achievement evaluation criteria	X					X
2. Teachers determine practical techniques for student progress assessment	X					X
3. Teachers decide on testing and scoring criteria for student achievement assessment procedures	X					X
4. Teachers determine classroom physical environment	X					X
5. Teachers select teaching materials from a known inventory	X					X
6. Teachers decide on classroom work procedures	X					X
7. Teachers determine norms and rules for student classroom behavior	X					X
8. Teachers pick and use specific instruction subjects out of the mandatory curriculum	X					X
9. Teachers reward deserving students without the need to get the principal's consent	X					X
10. Teachers add to or delete teaching subjects from the official curriculum	X				X	
11. Teachers make decisions on school expenditures		X			X	
12. Teachers make decisions on budget planning		X			X	
13. Teachers share responsibility for school finances		X			X	
14. Teachers are authorized to spend money on activities such as recreation and leisure		X			X	
15 Teachers decide on class timetable policy		X			X	
16. Teacher focus groups decide on curriculum matters for the whole school		X			X	

(Table Continued)

Category I: Friedman (1999)

Indicator Item	Factor I	Factor II	Factor III	Factor IV	SWZ	CRZ
17. Teachers decide on student demographic class-composition policy		X			X	
18. Teachers decide on the location and timetable for their in-service training courses			X		X	
19. Teachers initiate topics for their professional development and in-service training			X		X	
20. Teachers decide on general criteria for their professional development			X		X	
21. Teachers select subjects for their in-service training sessions based on agreed upon criteria			X		X	
22. Teachers determine their own enrichment general education programs			X		X	
23. Teachers appoint the instructors for their in-service training and professional development programs			X		X	
24. Teachers initiate and develop completely new curricula				X	X	
25. Teachers initiate and administer new enrichment and cultural activities				X	X	
26. Teachers contrive unique topics for the social cultural and general enrichment activities of students				X	X	
27. Teachers devise new curricula, using new and old elements				X	X	
28. Teachers formulate and try out innovative curricula				X	X	
29. Teachers introduce new extracurricular items into the school				X	X	
30. Teachers introduce changes and modifications into the formal curriculum				X	X	
31. Teachers compose new learning materials for their students				X	X	

(Table Continued)

Category I: Pearson & Hall, (1993); Pearson & Moomaw, (2005, 2006)

Indicator Item	Factor I	Factor II	Factor III	Factor IV	SWZ	CRZ
1. The materials I use in my class are chosen for the most part by me	X					X
2. I am free to be creative in my teaching approach	X					X
3. The selection of student-learning activities in my class is under my control	X					X
4. Standards of behaviour in my classroom are set primarily by me	X					X
5. I seldom use alternative procedures in my teaching	X					X
6. I follow my own guidelines on instruction	X					X
7. In my class, I have little control over how classroom space is used	X					X
8. The evaluation and assessment activities used in my class are selected by others	X					X
9. I select the teaching methods and strategies I use with my students	X					X
10. The scheduling for the use of time in my classroom is under my control		X			X	
11. I have little say over the scheduling of the use of time in my classroom		X			X	
12. In my teaching, I use my own guidelines and procedures				X	X	
13. My teaching focuses on the goals and objectives I select myself				X	X	
14. The content and skills taught in my class are those I select				X	X	
15. In my situation, I have little say over the content and skills that are selected for teaching				X	X	
16. What I teach in my class is determined for the most part by myself				X	X	
17. In my situation, I have only limited latitude in how major problems are solved	X	X	X	X	X	X
18. My job does not allow for much discretion on my part	X	X	X	X	X	X

(Table Continued)

Table 3A2

Autonomy Indicators Used in Category II Studies Classified by Friedman (1999) Factor

Category II: Ingersoll (1996) -- 1987-1988 SASS Indicators

Indicator Item	Factor I	Factor II	Factor III	Factor IV	SWZ	CRZ
How much control do you think you have IN YOUR CLASSROOM over each of the following areas of your planning and teaching?						
1. Selecting textbooks and other instructional materials	X					X
2. Selecting teaching techniques	X					X
3. Determining the amount of homework to be assigned	X					X
4. Selecting content, topics, and skills to be taught	X					X
5. Disciplining students	X					X
How much actual influence do you think teachers have over school policy in each of the following areas?						
1. Setting discipline policy		X			X	
2. Establishing curriculum				X	X	
To what extent do you use the information from your students' test scores –						
1. To group students into different instructional groups by achievement or ability		X				X

(Table Continued)

Category II: Liu, (2007) -- 1999-2000 SASS Indicators

Indicator Item	Factor I	Factor II	Factor III	Factor IV	SWZ	CRZ
How much actual influence do you think teachers have over school policy AT THIS SCHOOL in each of the following areas?						
1. Setting performance standards for students		X			X	
2. Setting discipline policy		X			X	
3. Deciding how the school budget will be spent		X			X	
4. Determining the content of in-service professional development programs			X		X	
5. Evaluating teachers			X		X	
6. Hiring new full-time teachers			X		X	
7. Establishing curriculum				X	X	

Appendix 3B

Table 3B1

Autonomy Indicators Used in the Literature Classified by Friedman (1999) Factor I

Friedman (1999) Factor I: Student Teaching and Assessment (classroom practice of student attainment evaluation, norms for student behavior, physical environment, different teaching emphasis on components of mandatory curriculum)

Category II: Ingersoll (1996) 1987-1988 SASS Items

How much control do you think you have IN YOUR CLASSROOM over each of the following areas of your planning and teaching?

1) Selecting textbooks and other instructional materials, 2) Selecting teaching techniques, 3) Determining the amount of homework to be assigned, 4) Selecting content, topics, and skills to be taught, 5) Disciplining students

Category I: Friedman (1999)

1) Teachers decide on testing and scoring criteria for student achievement assessment procedures; 2) Teachers determine classroom physical environment; 3) Teachers select teaching materials from a known inventory; 4) Teachers decide on classroom work procedures; 5) Teachers determine norms and rules for student classroom behavior; 6) Teachers pick and use specific instruction subjects out of the mandatory curriculum; 7) Teachers reward deserving students without the need to get the principal's consent; 8) Teachers add to or delete teaching subjects from the official curriculum

Category I: Pearson and Hall (1993), Pearson and Moomaw (2005, 2007)

1) The materials I use in my class are chosen for the most part by me; 2) I am free to be creative in my teaching approach; 3) The selection of student-learning activities in my class is under my control; 4) Standards of behaviour in my classroom are set primarily by me; 5) I seldom use alternative procedures in my teaching; 6) I follow my own guidelines on instruction; 7) In my class, I have little control over how classroom space is used; 8) The evaluation and assessment activities used in my class are selected by others; 9) I select the teaching methods and strategies I use with my students

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Table 3B2

Autonomy Indicators Used in the Literature Classified by Friedman (1999) Factor II

Friedman (1999) Factor II: School Mode of Operating (establishing school goals and vision, budget allocations, school pedagogic idiosyncrasy, and school policy regarding class composition and student admission)

Category II: Ingersoll (1996) 1987-1988 SASS Items

How much actual influence do you think teachers have over school policy in each of the following areas?

1) Setting discipline policy

To what extent do you use the information from your students' test scores?

1) To group students into different instructional groups by achievement or ability

Category II: Liu (2007) 1999-2000 SASS Items

How much actual influence do you think teachers have over school policy AT THIS SCHOOL in each of the following areas?

1) Setting performance standards for students; 2) Setting discipline policy; 3) Deciding how the school budget will be spent

Category I: Friedman (1999)

11) Teachers make decisions on school expenditures; 12) Teachers make decisions on budget planning 13) Teachers share responsibility for school finances; 14) Teachers are authorized to spend money on activities such as recreation and leisure; 15) Teachers decide on class timetable policy; 16) Teacher focus groups decide on curriculum matters for the whole school 17) Teachers decide on student demographic class-composition policy

Category I: Pearson and Hall (1993); Pearson and Moomaw (2005,2007)

10) The scheduling for the use of time in my classroom is under my control; 11) I have little say over the scheduling of the use of time in my classroom

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Table 3B3

Autonomy Indicators Used in the Literature Classified by Friedman (1999) Factor III

Friedman (1999) Factor II: Staff Development (determining the subjects, time schedule, and procedures of in-service training of teachers as part of the general school practice)

Category II: Liu (2007) 1999-2000 SASS Items	Category I: Friedman (1999)
How much actual influence do you think teachers have over school policy AT THIS SCHOOL in each of the following areas?	
4) Determining the content of in-service professional development programs; 5) Evaluating teachers; 6) Hiring new full-time teachers	1) Teachers decide on the location and timetable for their in-service training courses, 2) Teachers initiate topics for their professional development and in-service training 3) Teachers decide on general criteria for their professional development 4) Teachers select subjects for their in-service training sessions based on agreed upon criteria 5) Teachers determine their own enrichment general education programs 6) Teachers appoint the instructors for their in-service training and professional development programs

Table 3B4

Autonomy Indicators Used in the Literature Classified by Friedman (1999) Factor IV

Friedman (1999) Factor IV: Curriculum Development (introducing new "homemade" or"imported" curricula by the teachers and introducing major changes in existing formal and informal curricula)

Category II: Ingersoll (1996) 1987-1988 SASS Items

How much control do you think you have IN YOUR CLASSROOM over each of the following areas of your planning and teaching?

4) Selecting content, topics, and skills to be taught

How much actual influence do you think teachers have over school policy in each of the following areas?

2) Establishing curriculum

Category II: Liu (2007) 1999-2000 SASS Items

How much actual influence do you think teachers have over school policy AT THIS SCHOOL in each of the following areas?

1) Establishing curriculum

Category I: Friedman (1999)

24) Teachers initiate and develop completely new curricula; 25) Teachers initiate and administer new enrichment and cultural activities; 26) Teachers contrive unique topics for the social cultural and general enrichment activities of students; 27) Teachers devise new curricula, using new and old elements; 28) Teachers formulate and try out innovative curricula; 29) Teachers introduce new extracurricular items into the school; 30) Teachers introduce changes and modifications into the formal curriculum; 31) Teachers compose new learning materials for their students

Category I: Pearson and Hall (1993); Pearson and Moomaw (2005, 2007)

12) In my teaching, I use my own guidelines and procedures; 13) My teaching focuses on the goals and objectives I select myself; 14) The content and skills taught in my class are those I select; 15) In my situation, I have little say over the content and skills that are selected for teaching; 16) What I teach in my class is determined for the most part by myself

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Appendix 3C

Models Tested

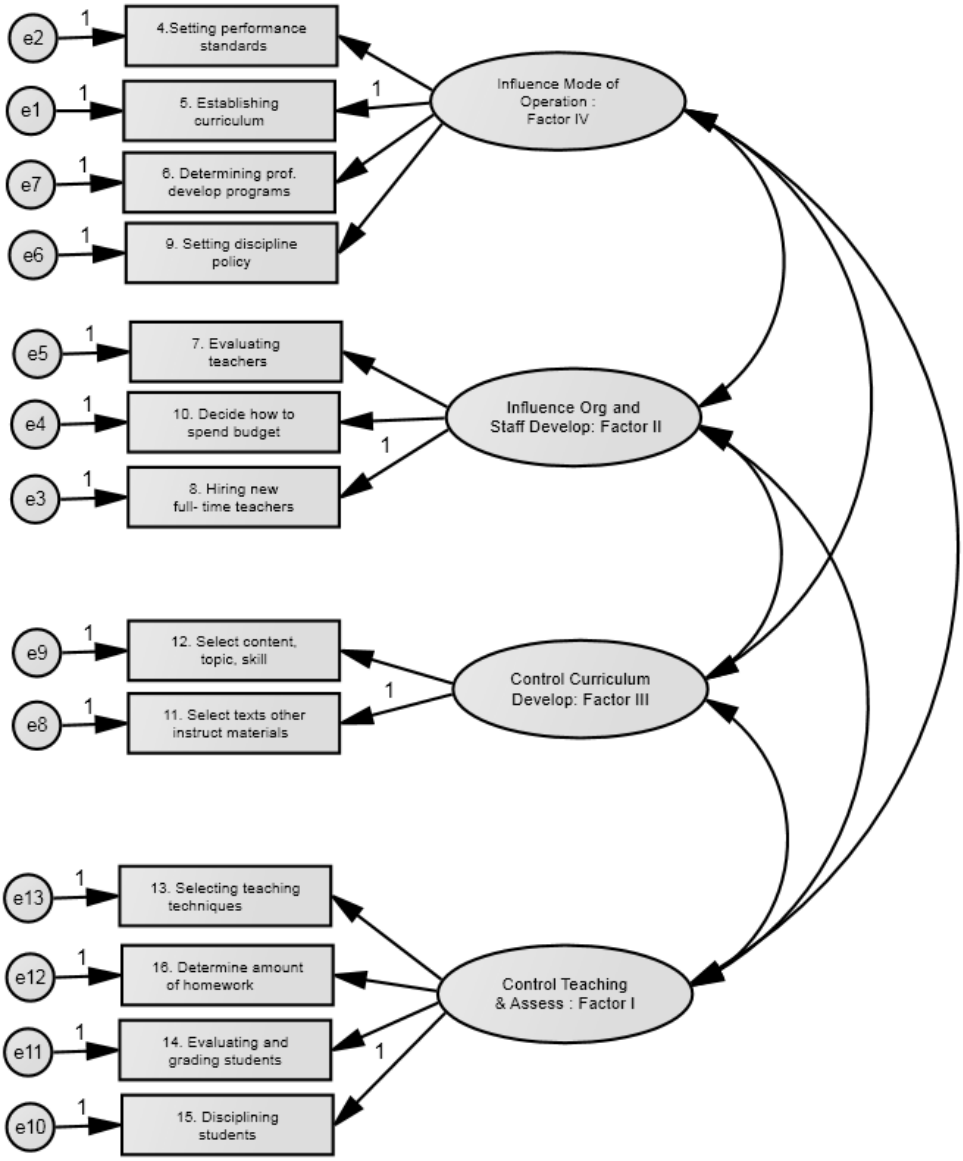


Figure 3C1. Model 1 - four primary factors, no error term correlations set free

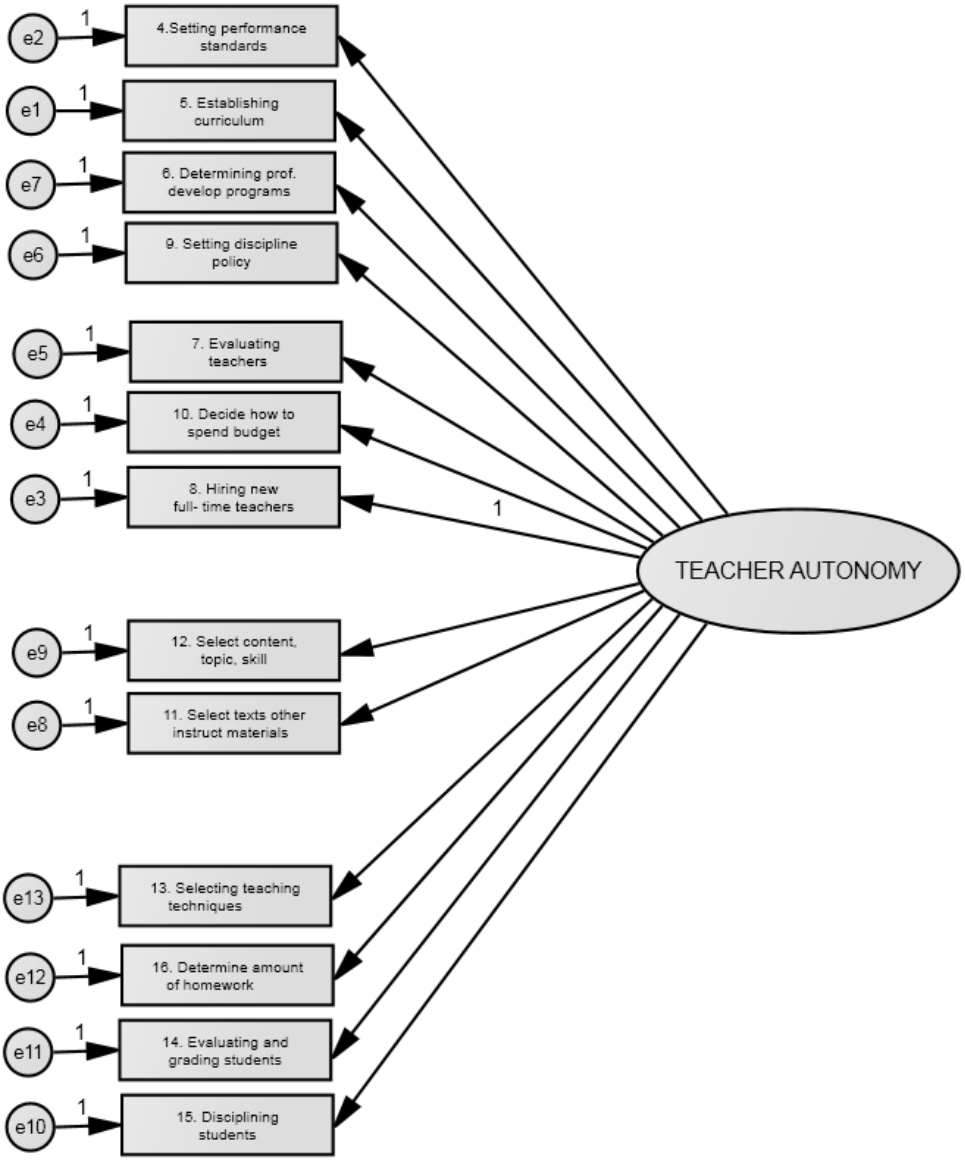


Figure 3C2. Model 2 - all items load on a single first-order factor, no error term correlations set free.

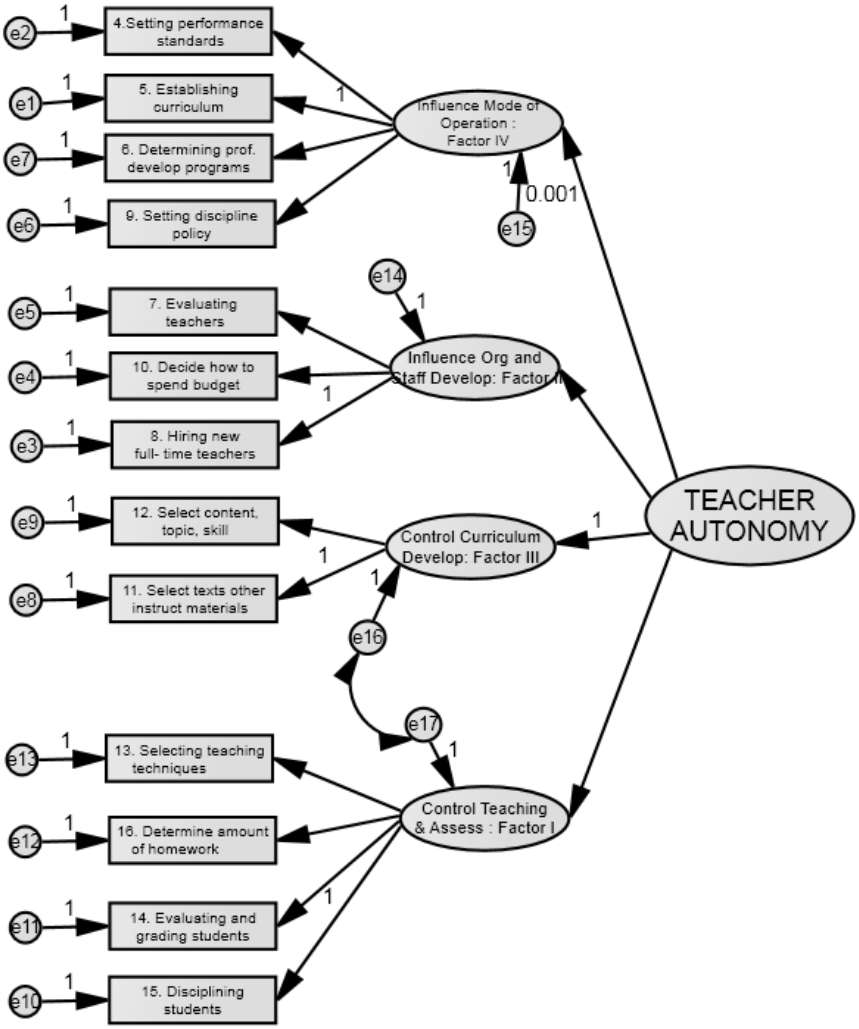


Figure 3C3. Model 3 - four first order factors project a single secondary (higher order) teacher autonomy factor. Variance of error term 15 (i.e. e15) designated to be .001 and one disturbance term correlation set free between e16 and e17.

Appendix 4A

Table 4A1

SASS-STA Model Fit Statistics for SASS 99-00 (TS99) and SASS 03-04 (TS03)

Sample	$\chi 2$	df	p	CFI	GFI	NFI	TLI	RMSEA	SRMR
TS99-TS03 Pooled	14,387	110	***	.96	.98	.96	.94	.04	.04
TS99	7,211	55	***	.96	.98	.96	.95	.05	.04
TS03	7,176	55	***	.96	.98	.96	.94	.05	.04

Note. TS99 = (SASS 99-00), TS03 = Secondary Sample (SASS 03-04). CFI = comparative fit index; GFI = goodness of fit index; NFI = normed fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; and SRMR = standardized root mean squared residual. For the CFI, GFI, NFI, and TLI indices, values greater than .90 are considered acceptable, and values greater than .95 indicate good fit to the data (Hu & Bentler, 1999). For well-specified models, an SRMR of .09 or less and a RMSEA of .06 or less reflects a good fit (Hu & Bentler, 1999). ***p < .001

Appendix 4B

Table 4B1

SMPS/SASS 1999-2000 (TS99) Sub-group Fit Statistics

Sample	$\chi 2$	df	p	CFI	GFI	NFI	TLI	RMSEA	SRMR
TS99 All 99-00 Regular Full-Time Tenured-Non-Tenured	17,378.49	152	***	.94	.96	.94	.92	.05	.06
Pooled	11,805.97	304	***	.94	.96	.94	.92	.03	.06
Tenured	9,591.34	152	***	.94	.96	.94	.92	.05	.06
Non-Tenured	2,214.62	152	***	.94	.96	.94	.92	.05	.06
Union - Non-Union									
Pooled	13,777.90	304	***	.94	.96	.93	.92	.03	.06
Union	10,295.11	152	***	.93	.96	.93	.92	.05	.06
Non-Union	3,482.79	152	***	.94	.96	.94	.92	.05	.06
Secondary Math - Secondary Art/Music									
Pooled	1,789.92	304	***	.93	.96	.92	.91	.03	.06
Math	1,216.94	152	***	.93	.96	.92	.91	.05	.06
Art/Music	572.99	152	***	.94	.96	.92	.93	.05	.06
Secondary English - Secondary Art/Music									
Pooled	1834.66	304	***	.94	.96	.92	.92	.03	.06
English	1,261	152	***	.93	.96	.93	.92	.05	.06
Art/Music	572.99	152	***	.94	.96	.92	.93	.05	.06
Public – Charter									
Pooled	14,818.56	304	***	.94	.96	.93	.92	.03	.06
Public	13,520.72	152	***	.94	.97	.94	.92	.05	.06
Charter	1,297.68	152	***	.93	.95	.93	.92	.06	.06
Public – Private									
Pooled	15,542.34	304	***	.94	.97	.94	.92	.03	.06
Public	13,520.72	152	***	.94	.97	.94	.92	.05	.06
Private	2,021.62	152	***	.95	.96	.94	.93	.05	.05
Charter – Private									
Pooled	3,319.36	304	***	.94	.96	.94	.93	.04	.06
Charter	1,297.68	152	***	.93	.95	.93	.92	.06	.06
Private	2,021.62	152	***	.95	.96	.94	.93	.05	.05

Note. TS99 = SASS 199-2000 Sample. CFI = comparative fit index; GFI = goodness of fit index; NFI = normed fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; and SRMR = standardized root mean squared residual. For the CFI, GFI, NFI, and TLI indices, values greater than .90 are considered acceptable, and values greater than .95 indicate good fit to the data (Hu & Bentler, 1999). For well-specified models, an SRMR of .09 or less and a RMSEA of .06 or less reflects a good fit (Hu & Bentler, 1999).

Table 4B2

SMPS/SASS 2003-2004 (TS03) Sub-group Fit Statistics

Sample	$\chi 2$	df	p	CFI	GFI	NFI	TLI	RMSEA	SRMR
TS03									
All 03-04									
Regular									
Full-Time	16,229.71	152	***	.94	.97	.94	.92	.05	.06
Tenured-									
Non-Tenured									
Pooled	10,760.10	304	***	.94	.97	.94	.92	.03	.06
Tenured	8,911.14	152	***	.94	.97	.94	.92	.05	.05
Non-Tenured	1,848.92	152	***	.94	.96	.93	.92	.06	.06
Union -									
Non-Union									
Pooled	13,572.03	304	***	.94	.97	.94	.92	.03	.06
Union	9,785.79	152	***	.94	.97	.94	.92	.05	.06
Non-Union	3,786.24	152	***	.94	.97	.94	.92	.05	.06
Secondary Math -									
Secondary Art/Music									
Pooled	1,779.68	304	***	.93	.96	.92	.92	.03	.06
Math	1,133.66	152	***	.93	.96	.92	.92	.05	.06
Art/Music	645.99	152	***	.94	.96	.92	.92	.05	.06
Secondary English -									
Secondary Art/Music									
Pooled	2,030.33	304	***	.93	.96	.92	.92	.04	.06
English	1,384.31	152	***	.93	.96	.92	.91	.05	.06
Art/Music	645.99	152	***	.94	.96	.92	.92	.05	.06
Public –									
Private									
Pooled	15,543.56	***	304	.94	.97	.94	.92	.03	.05
Public	13,360.85	***	152	.94	.97	.94	.92	.05	.05
Private	2,182.71	***	152	.94	.97	.94	.93	.05	.05

Note. TS03 = SASS 2003-2004 Sample. CFI = comparative fit index; GFI = goodness of fit index; NFI = normed fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; and SRMR = standardized root mean squared residual. For the CFI, GFI, NFI, and TLI indices, values greater than .90 are considered acceptable, and values greater than .95 indicate good fit to the data (Hu & Bentler, 1999). For well-specified models, an SRMR of .09 or less and a RMSEA of .06 or less reflects a good fit (Hu & Bentler, 1999).

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