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A Validation Study of the Administrator Data Use Survey

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A VALIDATION STUDY OF THE ADMINISTRATOR DATA USE SURVEY

BY

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ABSTRACT

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The purpose of this study was to create an original instrument, the Administrator Data Use Survey (ADUS), to assess practicing school administrators' perceptions of the importance of data to school improvement, the importance of data to their position, and the degree to which they feel their graduate preparation in educational administration adequately prepared them for the data use demands of their position. Validation panels were used to assess construct, content, criterion, and face validity of the ADUS. In addition, factor analysis was utilized for construct validation. The ADUS was sent to a random sampling of practicing administrators from New York State. Spearman Brown split-half reliability coefficients and Cronbach's alpha were estimated from the responses of this sample.

The final instrument was found to have construct validity, with four distinct factors extracted through the factor analysis. Furthermore, the researcher-hypothesized framework was congruent to the extracted factor structure. In addition, the responses of the panels indicated that the instrument was content, criterion, and face valid. The ADUS was found to be reliable with split-half and internal reliabilities at $\alpha > .80$ for all reliability statistics.

Recommendations for replication of the study as well as expansion to other administrative positions were made. In addition, the value of the ADUS as a post-job-placement assessment of preparation programs by universities as well as pre-placement screening instrument was suggested. Further study in the context of the theory of

planned behavior was recommended. Finally, a large scale administration of the ADUS may yield valuable data to drive state licensing agencies and bodies to revise certification requirements for practicing administrators.

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Dedication

I dedicate this work to my wonderful and loving wife, Karen, and to my beautiful and talented children, Emily, Hannah, Thomas, and Christopher. None of this would have been possible without your love, support, and sacrifice. I hope and pray that the sacrifices we make today bear fruit in our family's success, love, and joy in the future.

Summers belong to the family once again and I cannot wait to sit by the fire on the deck, stare at the stars, and dream.

I love you.

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Chapter I Introduction

Background of the Study

Over the past two decades, there has been an increased emphasis on accountability within the educational community. From the publication of *A Nation at Risk* (National Commission on Excellence in Education, 1983) to the No Child Left Behind legislation (NCLB) in 2001, students, teachers, and administrators are being held accountable for meeting Annual Measurable Objectives (AMO) for Adequate Yearly Progress (AYP) as well as a litany of other acronyms and requirements. "Across the United States, state legislatures are responding to rising expectations in the workplace and the demand of a global economy by setting higher standards for schools" (Bottoms & O'Neill, 2001, p. 5). Much attention has been paid to this accountability on all levels of government and across myriad levels of discourse. Annually, across New York State, and across the nation, newspapers are publishing assessment results, as well as dropout rates, college plans, and other data. "The growing emphasis on educational standards, equity, continuous improvement, and accountability that now drives ... reform is fueled by widespread recognition that schools must become high-performing organizations if they are to prepare all students to succeed in the twenty-first century" (Lachat, 2001, p. 7).

The increased accountability for students, and by inference school performance, has led to an increased emphasis on the use of data in the educational system. There is growing evidence on the importance of data collection, data analysis, data interpretation, and data driven decision making to academic achievement (Schmoker, 1999 & 2001).

"Legal and policy mandates at the national and state levels...have created additional responsibilities for school administrators...these responsibilities create additional demand for data collection and analysis" (Edirisooriya, 1998, p. 268).

The mid 1990's saw an increase in the discussion on the adequacy of school administrator preparation programs. States began to examine the issue of administrator standards and of credentialing administrator preparation programs so as to ensure that they were meeting the needs of practicing administrators. Two organizations, the Interstate School Leaders Licensure Consortium (ISLLC) and the National Council for Accreditation of Teacher Education (NCATE) were instrumental in the development of standards for administrators. States began to adapt their standards to those of these organizations, and universities began tailoring their programs to meet the standards.

There has been some research conducted on data use on the school district level (D'Agostino, 2002; Duncan, 2002; Miller, 2002), though that which exists is primarily in doctoral dissertations. In addition, an increasing amount of research has been conducted on administrator preparation for the 21st Century (Allen, 2003; Jolly, 1995; Reale-Foley, 2003), again, much of this is in dissertations. Little has been written, and next to no research has been conducted, on the topic of administrator preparation for a data driven educational system. Results of a 2002 survey of Oregon school administrators indicate that though practicing school administrators believe that communicating pupil achievement data to various constituencies is important to their position, they feel that their administrative preparation program inadequately prepared them for this job. Furthermore, they felt ill prepared to develop school improvement plans to address student achievement issues (Zanville, Greenfield, Chenoweth, & Carr, C., 2002). The

scientific and business worlds have long recognized the importance of examining data and adapting practice to meet deficiencies highlighted by it. The educational system claims to employ these methods to improving school and student performance. However, systemically, the system and individual districts and schools may not be prepared for the effective use of the wealth of information available.

Purpose of the Study

The purpose of this study was to create an original instrument to assess: a) the perceptions that administrators have in regard to the importance of data use to improving student achievement, b) the perceptions that administrators have in regard to the importance of data use to their job, and c) the perceptions that practicing administrators have in regard to their graduate preparation and training for data use. The study attempted to ascertain content, face, criterion, and construct validity of this instrument. Finally, it was intended to determine the reliability of the instrument.

Statement of the Problem

In the wake of increased accountability brought about by the No Child Left Behind (2001) legislation as well as the movement towards a standards-based education program in New York State, there is an increased need for educators on all levels to be able to effectively analyze data relevant to student performance and utilize this information to formulate prescriptive plans to address individual student needs and programmatic issues to promote student achievement. In addition, it is imperative that school leaders be able to communicate data and their meaning to constituencies of varied

sophistication. It is worth noting that no coursework in data analysis, statistics, or research is required for New York State Certification as an administrator. It is essential that an assessment of a practicing administrator's knowledge of this type of data analysis on all levels be conducted. As no instrument for this assessment existed, this study was intended to create a valid and reliable instrument for this purpose.

Significance of the Study

One would not expect practicing administrators to be "crunching" numbers and making advanced statistical calculations at the cost of performing other duties. This would compound leadership problems in the school. As Bernhardt (2000) wrote, "Educators don't need advanced degrees in statistics to begin gathering and using data in ways that will benefit schools and children" (p. 5). School leaders must, however, be able to analyze data from multiple sources. They must be trained to interpret the findings of a statistical analysis (gleaned through a software program or statistical analysis from a data warehouse). They must be able to work with teachers and school boards to make instructional changes based on the data. Finally, they should be able to convey the meaning of mountains of information to teachers, parents, board members, community leaders, and media in terms that each constituency can digest. The leader must be proficient at explaining the significance of the data and in trends in the data. "Data use and dissemination of information is a big part of instructional leadership" (Cromley & Hanson, 2000, p. 8). "Effective principals systematically collect such evidence, as it supports instructional policy and serves as the basis for program improvement"

(Thompson, 2001). This study represents the beginning of the needs assessment of the profession.

The intent of this study was to create a valid and reliable instrument to assess administrator perception on data use. There are many potential uses for a valid instrument of this nature. It may be used to yield important information regarding the degree to which practicing administrators are prepared to analyze data and meet with the public, or teachers, or policy makers to answer the tough questions about what to do about falling English Language Arts scores or how to address concerns over a plateau in Mathematics scores. It may raise awareness of the degree to which new administrators entering the field are prepared to perform the duties for which they have been hired. It will either laud the achievements or condemn the failings of a certification system that, even after revision, places no specific coursework requirements on administrators, except for the number of credits, requirement of an internship, a background check, and two workshops. It may be useful for universities to use as a post-career placement evaluation of their programs. It may illuminate gaps between practicing administrators' competency and their job requirements. Finally, if a link can be established between administrator perceptions, or attitudes, and their practice, this study may yield an instrument with predictive value that indicates that an emphasis on data use can truly improve student achievement.

Despite claims that data use has a profound effect on student achievement, there have been few research studies to assess administrators' perceptions of the importance of data to improving student achievement. In addition, writing on administrator preparation indicates a dearth of empirical studies to analyze particular areas of administration. The

call for the identification of a knowledge base for school administrators truly highlights the importance of such a study.

Hypothesis

The study resulted in the creation of a valid and reliable instrument to assess three themes, including administrator perceptions of: a) the importance of data to improving student achievement; b) the importance of data to administrators' current position: and c) the degree to which administrators' graduate preparation in educational administration prepared them for the data use responsibilities of their position. The assumed hypothesis for this study was that the Administrator Data Use Survey (ADUS) is a valid and reliable instrument that accurately reflects the perceptions of school administrators along these three themes.

Definitions of Terms

Building level administrator: a New York State certified district-level official serving in the following capacity: principal, head of school, supervisor, department chairperson, assistant principal, unit head and any other person serving more than 25 % (10 periods per week) of her/his assignment in any administrative and/or supervisory position. (New York State Education Department, 2005a)

Data-based decision making: "Examining sources of information (class and school attendance, grades, test scores) as well as other data (portfolios, surveys, interviews) to make decisions about the school. The process involves organizing and

interpreting the data as well as communication of the data and creating and implementing action plans" (Association for Supervision and Curriculum Development, 2005. p. D).

School district administrator: a New York State certified district level official serving in the following capacity: superintendent of schools, district superintendent, deputy superintendent, associate superintendent, assistant superintendent and any other person having responsibilities involving general district-wide administration (New York State Education Department, 2005b)

Limitations of the Study

In a validation study, limitations and delimitations pose a threat to internal and external validity. There were several limitations to this study. They are as follows:

1. The data were derived from a self-report instrument.
2. It was possible that participants' responses were influenced by the placement of the questions within the survey.
3. There was no opportunity for respondents to seek clarification of any of the items, were there to be any issue of interpretation.
4. The norming sample was drawn from a database of administrators, the majority of whom are principals and superintendents.

Assumptions of the Study

1. There is some connection to what administrators believe about data and how they will act to use data.

2. Those who possess data-use skills will be able to utilize those skills for the analysis, interpretation, presentation, and communication of data.

Chapter Two Related Literature

Literature on Impact of Data on Student Achievement

In the past two decades, there has been an increased recognition of the importance of data analysis to improving student achievement. While some of this writing has appeared in refereed journals, a great deal of material has been produced in a number of books. Furthermore, a growing body of research is being presented in dissertations and doctoral records of studies.

School leaders have embraced the scientific method and action research as a means towards improvement. They must have evidence of the existence of a problem in order to champion a proposed solution to it. Data of myriad varieties can be used to provide this evidence. The quantifiable nature of test data has an appeal to problem analysis. In a policy paper on data-driven reform, Lachat (2001) wrote that schools must be focused on data and use it effectively in order to achieve higher expectations for all students. Her writing on data-driven high school reform was supported by the Educational Laboratory at Brown University and endorsed by the National Association of Secondary School Principals (NASSP). She connects the milieu of schools of the 21st century to success and improvement through the use of data and data analysis. Killion and Bellamy (2000), in a non-refereed journal, continue along the same line, indicating that schools that fail to utilize data effectively ignore the power of a tool that can be used to identify issues within the system. They are not able to address these issues or monitor plans for addressing them. Schools that use data work judiciously to address weaknesses

and ameliorate them. Data use allows for goals formation with student learning at the center.

Killion and Bellamy (2000) write in advocacy of a data analyst. Their focus is not on school administrators and their work with data. They do, however, bring to light the importance of principals to the process of data-driven decision making. In addition, the passage of NCLB in 2002 increases dramatically the importance of this model of data driven decision making.

Zmuda, Kuklis, and Kline (2004) identify six steps of continuous improvement in their work, *Transforming Schools: Creating a Culture of Continuous Improvement.* They call on schools to ascertain the present state of the school and identify "gaps between the current reality and the shared vision" (p. 18). This necessitates collecting and analyzing the data thoroughly. It also necessitates formulating means to close the gaps and acting on those plans. They discuss the importance of communication and shared vision as well as an understanding that different groups interpret meanings differently. It is important that each constituency's information needs be met.

Zmuda et al.'s (2004) discussion of the importance of data in the context of continuous improvement parallels Holcomb (2004) and Bernhardt (2004). They view data a key means of connecting practices and vision based on core beliefs. Data can be used to paint a picture of the current state of the district as well as formulate plans for improvement. This Association for Supervision and Curriculum Development (ASCD) book does not approach data use from a research perspective. Its value comes from fact that it echoes Holcomb and Bernhardt. In addition, it provides an example of how school personnel can approach data analysis as a means of improving student achievement.

Danielson (2002), too, sees data use as part of the larger picture of action planning for instructional improvement. Her view is that administrators and data personnel need to work with the data on a daily basis. In addition, she sees all teachers sharing in the responsibility for data collection, disaggregation, and analysis. She even points to the benefits of involving parents and students in the process. Neither the Danielson nor Zmuda, Kuklis, and Kline works make specific recommendations for training for data use.

Data is perceived as important to improving student performance, yet it is not being used effectively or as often as it should be to bring about change in student achievement and schools. There are a number of underlying reasons that this may be the case. Bernhardt (2000, 2004) indicates that data is not seen as a top priority and that because of this lower station, resources are not allocated to this worthwhile endeavor. She continues that educators have a general disdain for data and that they fear that it will be used against them. Sparks (2000), in an interview with Mike Schmoker, further addresses the barriers to data use. These barriers include fear and fatalism. In addition, districts must make the purpose of data use clear, student achievement. They may not be doing so. Districts must create a climate where data is valued, not feared. They may, through their own practices as well as policies of the state and federal government, perpetuating the fear of data. They must embrace opportunities for staff development if data-driven improvement is to be achieved. This is among the recommendations of the American Association of School Administrators (AASA, 2002) as well. The focus must be kept on improving student learning, and it must be approached as a shared responsibility.

One may question the level of sophistication that a school administrator needs in order to effectively use data for school improvement. There is divided opinion on this issue. Bernhardt (2004) writes of the level of skill that school personnel need, indicating, "Educators don't need advanced degrees in statistics to begin gathering and using data in ways that will benefit schools and students" (p. 5). Creighton (2001) indicates that anyone with an understanding of algebra can manage the data and statistical analysis required for schools. Still, Bernhardt (2000) continues that "too few people at the school level are adequately trained to gather and analyze data" (p. 5). Lachat (2001), citing work by Cizek (2000), as well as Wise, Lukin, and Roos (1991), further supports this viewpoint. What this may imply is that the specific knowledge and skills requisite to data use for school improvement are not present in administrators and teachers. These skills include the ability to analyze data from a variety of sources, the ability to determine the significance of trends, patterns, and gaps, the ability to disaggregate the data to examine with greater detail the meanings, and the ability to communicate these data and findings to a varied group of consumers for a number of purposes.

Bernhardt (2004) addresses the lack of focus on data in education that is not present in business. There are notions within the school community that data use is something that does not belong in schools. As data mining and data use practices are common and integral to the scientific and business world, some in educational circles feel that it does not belong in discussions of improving the performance of children. Schools and districts have traditionally not seen the imperative of data. Critics of data use view an overemphasis on data as dangerous. Concentration on numbers may cause some to lose focus on the students, they argue. The reality is that in schools, hunches and gut

feelings are frequently given greater credibility than is hard data. Finally, Bernhardt (2000) indicates that because state educational authorities are not stressing skills of data analysis, the likelihood of districts and schools to do so is slight.

Lachat (2001) wrote of the perception by school personnel that data generally is not that important. The belief is that analysis is done haphazardly to serve another person's position. It is not seen as integral to improving student performance. Again, Lachat wrote in the pre-NCLB era. In the years since the passage of this legislation, the rules of accountability have changed. Any individual, be it teacher or administrator who does not feel the pressure of accountability and who is not using data as a means of improving student performance is potentially doing a disservice to his/her students, school, and district.

Lachat (2001), citing the work of Schmoker (1996) discusses another barrier to data use. Schmoker referred to this phenomenon as fear and fatalism. There is a fear, in some cases founded, that data will be used against school personnel. This is especially evident in the NCLB era as schools districts may face sanctions if they do not perform adequately. What is seen as poor performance manifests itself into a loathe for the numbers that highlight this performance.

While it is certainly possible that school officials are being held accountable for student performance, this is not a new phenomenon. Teachers and administrators have, for the most part, always been held accountable for student performance. The difference in this environment of accountability is that the state and national governments have established benchmarks of that performance. Arguments in the name of fear of retribution for poor performance do not take away the potential good that can come from

examining data from a variety of sources to drive systemic changes. Based on sound data and using proven improvement strategies, the data can actually empower the fearful with a weapon to be used to ward off attacks. Moreover, data can be used to identify areas of improvement that will produce stronger performance in the future.

The fatalism argument concerns issues of motivation and esteem among students, families, and school personnel. This argument is centered on the notion that, with data use, poorly performing students, schools, and districts will suddenly realize that they are performing poorly. The reality is that they likely know that the performance is sub par. Students and teachers know when they have not achieved. Armed with data, the district, or individual school, teacher, or student, can begin to set measurable goals for improvement. They can develop plans to bridge gaps in performance. Finally, they can monitor progress towards those goals. Again, data use is a powerful tool for school improvement.

Studies are showing the effect of systematic data analysis. For the most part, these studies are showing the effect on instruction (Massell, 2000). There is a belief that with the emphasis on improved instruction and best practices student achievement will improve. The American Association of School Administrators (AASA, 2002) reports that data can be used to gauge student progress as well as evaluate the efficacy of programs. "Data help district and school leaders craft a sound blueprint with measurable results for continuously improving schools so decisions are no longer based on incomplete or biased information" (AASA, 2002, p. 2). Bernhardt (2004) identifies 14 uses of data in schools. Among these are improving teaching, measuring the effectiveness of programs, problem identification, and promoting accountability (p. 16).

These can be accomplished when data "replaces hunches and hypotheses with facts" (p. 3).

Richardson (2005) outlines eight steps for marked improvement that were implemented in Warren Township, Indiana. These include: (a) disaggregation of student data, (b) formation of an instructional calendar based on that data, (c) delivery of an instructional focus, (d) assessment of standards using multiple locally developed measures, (e) supporting children who failed to master the standard, (f) enrichment activities for children who did, (g) monitoring the standards, and (h) monitoring instruction through a variety of means. Data analysis, interpretation, problem identification, and planning are at the crux of these steps. This focus on improvement based on data brought about improvement in student performance.

Holcomb (2004) addresses the issue of data use for student achievement. She discusses research on data use to close the achievement gap facing students of color and low-income students. Data is used to analyze curriculum as well as identify individual student needs. Once problems have been identified, school personnel can collaborate towards a solution. She summarizes the work of Shannon and Bylsma (2003) which identifies nine characteristics of high performing schools. Data analysis and use are clearly integral to maintaining standards and expectations and curriculum, instruction and assessment aligned with standards (Holcomb, 2004).

Later work of Shannon and Bylsma (2004) continues along the theme of school improvement, expanding the characteristics of improved schools to 13. In *Characteristics of Improved School Districts: Themes from Research* they present a body of research that examines the traits that improved schools have in common. "Improved

districts use data as evidence to monitor results, for making instructional and resource allocation decisions, and for accountability" (Shannon & Bylsma, 2004, p. 8). Shannon and Bylsma (2004) found that improved districts effectively utilized data. Seven of the ten research studies they examined identified effective data use as crucial for improving schools. Schools that showed improvement "used data to monitor results, equity, accountability, and for resource allocation...for instructional decisions and professional development" (p. 56). Improved schools "rely heavily on data to make decisions" (p. 75) as well as for planning. The work highlights the importance of data use to improving student achievement. Shannon and Bylsma (2004) present an analysis of studies that have lead to improvements primarily in elementary schools. They admit this limitation. In addition, they offer the caveat that the studies examined schools in a time context, and that as time progressed, the context may have as well, and thus, the impact. The practices identified in these schools may not be readily applicable to every school. This disclaimer seems to highlight even more vividly the importance of using data. District and school leaders who are not willing to collect, analyze, and interpret data from their own system may be more inclined to take an improvement idea and try to implement it into their system, despite the fact that it may not *fit* their system. This may result in poorer performance which could indicate that data use actually decreases student performance.

Schmoker (2001) shows the impact that data can have through examples of five school districts. His discussion of the Milwaukee Public School System, Adelai Stevenson High School, Oak Park Schools, Glendale Union High School, and Brazosport Independent School District shows that data is at the heart of school improvement. Each of these schools showed marked improvement in student achievement through attention

to results and use of these results to drive decision making. Schmoker provides evidence of the power of data-driven decision making.

A fair amount of research on the use of data for school improvement was conducted by doctoral students for dissertations. D'Agostino (2002), Miller (2002), and Duncan (2002) all conducted studies of the effective use of data to improve student achievement. These researchers were among a group who conducted this research for a doctoral program at the University of Southern California. Proceeding through a similar methodology based largely on case study data from one school or district, each published dissertation presents a different picture of data use. Due to the foci of the studies, each presents a relatively limited picture of data. Though not expressly stated, each study conveys an underlying assumption that administrators are prepared for data analysis and interpretation.

D'Agostino (2002) wrote that any district policy for data use will be ineffective if district and building personnel do not possess the skills to utilize the information. She continued, writing "There is not adequate teacher planning time set aside for discussion about student performance data and strategies for improvement" (p. 125). While this may be true, there other issues to address. Infinite time for such discussion accompanied by no leadership knowledge base on data-driven change and improvement could end up being poorly used time. She acknowledges, in her conclusions, that that there is limited knowledge among teachers for data analysis. Her work was based on a case study of one middle school in California. Her research was completed as NCLB was signed into law and likely reflects a pre-NCLB data analysis milieu. Accordingly, her assumptions may not be generalized.

Miller (2002) indicates that the district that he researched uses a variety of methods for disseminating data. He also indicates that there is a coordinator for student data. "Principals distribute data…the district is responsible for publishing data" (Miller, 2002, p. 264). The Coordinator of Student Programs and Evaluation appears to be the district data expert. He or she processes the data. Administrators, assistant principals and the principal, each have a role in the results meetings that follow data. The question of preparation for this data analysis and use is not asked and, ergo, is not answered.

Duncan (2002), too, conducted a case study to examine data collection and use practices within a school district in California. His findings indicate that within this district administrators are being held accountable for data-driven decision making. He also highlighted the fact that in this district, data were used to examine instructional practices and address curricular weaknesses. Generally, teachers were comfortable with using data. He recommended the development for a systematic plan for data use as well as staff development for data use.

None of the three studies addressed the degree to which administrators are prepared to lead staff in data analysis. Each discussed the importance of data use to improving achievement. D'Agostino (2002) writes that "educators have no choice but to equip themselves to analyze the data that is generated about the performance of the students in their schools to make informed decisions about how to continuously improve learning outcomes" (p. 11). Leaders who are called on to move systems through data use must be prepared for this task. Without proper preparation, administrators may miss crucial opportunities to effect lasting change to their systems. Schools may become simply reactionary to data, rather than proactive for school wide improvement for student

achievement. One key question that begs asking is where school leaders should receive the training on data use.

Dissertations such as these represent the most recent research on districts' movements towards data driven decision making. Few studies have been conducted in the post NCLB era to assess perceptions of administrators towards data use. Research on the importance of data to administrative positions is also scarce.

Literature on Data and School Administration

Increasingly, articles and books concerning the importance of data to school administration are being written. Writing at the very beginning of the NCLB era, Creighton (2001) argues that data is crucial to school administration. He presents examples of how data may be effectively used by building administration to evaluate the efficacy of instructional methodologies as well as interpret assessment scores. He points to four weaknesses in traditional statistics courses. Because of the theoretical and mathematical bent of traditional statistics courses, the subject is often eschewed by educators who see it as lacking relevance to the profession. Traditional courses often do not emphasize the use of statistics software to ease the computational burdens so that the administrator can concentrate on the analysis and interpretation of the outcome. In addition, the courses often deal with hypothetical data, instead of real school data. Finally, the focus on inferential statistics ignores the fact that school leaders are most concerned with descriptive statistics that are useful for pushing their building or district's students' performance, rather than comparing that performance to students across the state or the nation. Creighton calls on the development of skills in administrators to use

data as a tool of continual improvement. He comes short of recommending that all administrators take statistics or coursework in data use. This is likely the case because many graduate courses in statistics do not use educational data as exemplars for teaching statistics.

Leithwood, Louis, Anderson, and Wahlstrom (2004) present an analysis of research on the impact of leadership on student learning. They conclude that building and district administration contributes to student achievement through many means. The use of data is one of 10 interdependent variables that connect leadership and learning. The work continues along this line, highlighting the importance of systemized data use to develop improvement plans. Leithwood, Louis, Anderson, and Wahlstrom (2004) assert that leaders must utilize balanced leadership to effectively and efficiently identify needs, identify solutions, and implement them. The leader who exercises balanced leadership will likely see positive change in the school. What does a leader need to know in order to exercise this balanced leadership? Again, instructional leadership demands that administrators utilize their resources, including staff, financial and informational, to improve student performance.

The use of data by building and district leaders can also serve to improve dialogue between administrators and various constituencies. The AASA guidance document on data indicates that, "data provide quantifiable proof, taking the emotion and rancor out of what can be tough calls" (AASA, 2002, p. 1). School leaders must be able to communicate data to staff, parents, school boards, and media. The ability to interpret data and communicate its meaning to these groups will enhance the credibility of the leader (p. 27). Yet, as Lachat (2001) pointed out, school personnel are not trained to

analyze, interpret, or present data effectively. Instead, they are being tasked with performing jobs for which they must learn as they go. This creates the potential for administrators who misinterpret or miscommunicate data to be seen as incompetent. There is a need for instruction.

Massell, cited in Shannon and Bylsma (2004), indicated the importance of training administrators and staff to use data to improve school performance. This training is deemed as crucial to creating a culture of data within a system. It eases some of the difficulty of the analysis. In addition, it eases some of the fears associated with data use in schools. It can foster communication and buy in among staff members. This can only happen when administrators are comfortable enough with the data to analyze it as a means of identifying and solving problems and communicating findings to each constituent group the appropriate level of sophistication.

Torrence (2002), in a doctoral dissertation, created an instrument to analyze principals' use of data. Approaching the topic from the perspective that there is not much in the way of research on principals' use of data and their perceptions of the importance of data, she surveyed a national sample of elementary principals. Her findings generally supported the research. She found that principals who had a positive view of data tended to use the data. She found that data were being used in multiple fashions as a component of instructional leadership. She found that principals felt that they would benefit from professional development in the area of display of statistics and discerning which data are important. She alluded to the importance of data as a means of improving student performance and called for the recruitment of principals who possess skills in data use. She does not address where these principals should acquire these skills. As her study

centered on elementary principals, it would be interesting to see if and how her results would be replicable with a sample of secondary or district-level administrators. Also, with the increased importance of data since her study was concluded, in early 2002, her results may not be replicable in the current environment, five years post NCLB.

Literature on Administrator Preparation and Standards

While writing on administrator preparation for data analysis is difficult to find, literature on administrator preparation is not. The 1998 National Council of Professors of Educational Administration Yearbook focused on *Leadership for Quality Schools* (Muth & Martin, 1998). Articles on technology and the application to special education, the use of cohorts, portfolios, and internships in administrator training, reflective practice, multiple intelligence, problem-based learning, parental involvement, and university/school partnerships filled the volume. Nearly every article began with a statement tantamount to the need to improve education for the 21st century requires that we improve educational administration.

Murphy and Vriesenga (2004) address the dearth of research on administrator preparation programs in a University Council for Educational Administration (UCEA) monograph, *Research on Preparation Programs in Educational Administration: An Analysis.* The introduction begins with several illustrative quotes on the paucity of research on the topic. In 1967, Erickson (as cited in Murphy & Vriesenga, 2004) indicated that research on the field of administration was an immature field with the work that did exist lacking rigor. It is apparent from Murphy and Vriesenga's study that, though nearly 40 years have passed since Erickson wrote, not much has changed in the

field. It is still an immature and largely unexplored field of true research. Analyzing over 25 years of writing on the subject, they attempted to classify in excess of 2000 articles in scholarly journals. Their findings indicate a small percentage of writing on administrator preparation. They point to the fact that some areas of administrator preparation have not been explored. Much of what has been written is not grounded in empirical research. On a positive note, they see a trend towards increased scholarship on administrator preparation recently, though they do not see evidence of commensurate qualitative improvements. They highlight the significant, yet small amount of dissertation work and call for external support of research in this arena of education. From their work, one can discern that further research in the area of preparation is warranted.

Edirisooriya (1998) addressed the need to improve training in educational administration. In his article, he refutes much of what Haller, Brent, and McNamara (1997) had written on the subject of the unimportance of graduate training to practicing administrators. He continues on to discuss how changes in education have necessitated changes in administrator preparation. "Neither first order universities nor second order universities adequately prepare skilled personnel to perform the activities and functions related to educational accountability" (Edirisooriya, 1998, p. 274). He calls on an increased "emphasis on research methods, statistics, educational technology, and educational data management as a core area of studies for future educational administrators" (p. 274).

Achilles (1984) questioned administrator preparation programs and their efficacy, casting some of the responsibility for poorly prepared administrators on higher education.

He indicates a rift between academia and practice. "Institutions should concentrate on preparing people for the key positions of principal and supervisor" (p. 131). Two decades ago, he wrote "they need attention to cognitive skills (e.g., legal principles), demonstration of skills (e.g., schedule building, parent conference), and guided practice in problem solving and instructional improvement (e.g., evaluation of personnel, collaborative supervision)" (p. 132).

"Colleges have failed to keep up with the changing performance standards by which their graduates must perform" (Wilmore, 2000, p. 350). This sentiment is repeatedly found in writing on educational administrator preparation. Wilmore continues that Thompson's National Policy Board for Educational Administration (NPBEA, 1993) report *Principals for our Changing Skills* takes the profession to a new level by identifying the skills base for principals at a time when the profession needs a restructuring. Though the profundity and import of the work is clear, what is often debated is what should be included in that knowledge and skills base.

Achilles (1988) provides a number of suggestions to improve educational administration. Among these, he points to the need for alignment between theory and practice. He highlights what universities can do as well as what State Education Agencies (SEA) can do. He points to improved certification requirements and standards as means by which the profession can be improved. He points to preparation "program" evaluations by state certification authorities. He cites these roles as being shared between the SEAs and professional administrator organizations. He suggests that associations "poll members for their perceptions and assessments of preparation programs" (p. 59).

"Without good research and evaluation of preparation programs, the field will continue to build from tradition and from trial and error" (Achilles & Ramey, 1990, p. 17).

Achilles and Ramey (1990) point to the notion that the field of educational administration has not developed a standardized knowledge base. This work was written prior to the adoption of administrator standards of NCATE and the ISLLC. Nevertheless, his statement rings true in many states. "The knowledge base for educational administration is comprised, in part, of state rules and licensure requirements, the practice of administration, research, theory, tradition, and folklore" (p. 15). This issue was addressed by Thompson (1993, 2001).

Shannon and Bylsma (2004) pose a crucial question regarding leadership and data. "How are school leaders trained to use multiple measures and analyze data" (Shannon & Bylsma, 2004, p. 8)? To a large extent, they are not trained well for these tasks. This fact creates a weak link in the chain of improvement made possible by data.

Thompson (2001) writes that "the knowledge and skills base of a profession should provide a platform for practice" (p. ix). In *Principals for Our Changing Schools: The Knowledge and Skills Base*, he discusses 21 domains that form the heart of the principalship. He divides these into four categories: Functional Domains, Programmatic Domains, Interpersonal Domains, and Contextual Domains. His introduction provides a call to action for principals. "If principals are to fulfill their school's responsibility for meeting the educational and developmental needs of their student, they must continually initiate action and respond to problems" (p. x).

Thompson's second domain, information collection, begins with the notion that information collection and use are crucial to the modern principalship. This has become

even more important to the profession in light of the No Child Left Behind legislation. Thompson calls on effective principals to be able to use descriptive statistics to calculate and interpret mean scores and standard deviations. Furthermore, he indicates that they should be able to communicate the information according to the sophistication of the audience. Principals should be able to work with staff to develop plans to ameliorate shortfalls in performance highlighted by the data.

Thompson discusses problems with the preparation of principals for data analysis. He indicates that many administrative programs do not offer coursework that leads to the skills development. Those that do, offer courses that do not challenge the students to develop skills that are truly applicable to the profession. In addition, those that do offer them as options that many students elect not to take. Again, like most other writers on the topic of administrator preparation for data analysis, Thompson falls short of actually recommending required coursework in statistics for all practicing administrators.

Perhaps the point of administrator preparation is moot. Haller et al. (1997) indicate that graduate preparation in educational administration had little impact on schools. They cite administrator satisfaction with their preparation as evidence to the weakness of the programs. Furthermore, they cite NASSP research that concludes that formal education and training has little effect on principal efficacy. The survey assessed the perceptions of administrator as a leader, one who maintains a climate with the same values and objective as teachers, order, or the degree to which students behave in an orderly manner, policy, the degree to which teachers felt that they had a share in building policy, and help, or helpfulness. The survey did not assess the degree to which the administrator uses resources to plan or to meet challenges. It did not point to his or her

use of data or his or her ability to juggle myriad responsibilities in an increasingly accountable environment. Perhaps the conclusiveness of which Haller et al. write is based on a paradigm of administration that must be expanded. By choosing to use an instrument that was designed for one purpose for an entirely different one, they have drawn conclusions that may not bear out should the right instrument be utilized.

English (2002) criticizes the ISLLC standards as facilitating administrator preparation for the current state, not the future state of the profession. He sees the call for a knowledge base as reinforcing the hegemony of the power structures associated with teaching and licensure. He counters the notion that the theory practice gap in educational administration can be bridged through traditional means. He views traditional preparation programs as preparing few leaders but many "technicians within the existing bureaucracy" (p. 57). Effective leadership is crucial for schools and for school improvement. However, leaders without certain technical skills may not have followers to lead. There are certainly some skills that administrators must possess.

Commenting on English, Murphy (2000) counters that "the standards should not simply codify what is; they should help elevate the profession to a new level" (p 4). Murphy's lofty hopes of administrator standards have them and the ISLLC binding "up the wisdom and energy of all the actors noted above in the service of developing leaders who can create powerful learning communities where all youngsters are well educated" (2001, p. 6).

Achilles and Price (2001) argue that without a knowledge base at the heart of the standards, anyone can run the schools. Interestingly, this call has been made for decades within the field. Achilles, and many others, criticize the field as lacking a knowledge

base yet proffer nothing that would pass as one. Achilles (2005) describes the knowledge base issue as a "playful puppy chasing its own tail in ever hilarious circles" (p 58). The debate persists as to what constitutes the *What?* of the knowledge base to which Achilles and Price (2001) allude. Until this is settled, the *How?* and *Why?* remain rhetorical questions.

Beach and Berry (2005) write of the breadth of the knowledge base in the context of the recent derision of the preparation of school leaders (Levine, 2005). They indicate that few are adequately acquainted with the various components that comprise it. Though, unlike Levine, they do not see the situation as all lost. "It is probably true that, as individuals, we do not completely know the knowledge base on which our profession rests. But, collectively we do know" (Beach & Berry, 2005, p 123). This statement points to the need for a great deal of research on many fronts to ascertain the gaps between the preparation and the practice.

The field continues to debate the lack of a knowledge base. Few within or on the outside proffer any suggestions as to what must be included in this knowledge base. The theoretical discourse is certainly enriching intellectually, especially considering the caliber of individuals writing, but has done little over the past decades to improve the field. The development of the ISLLC standards and state standards aligned to them are simply examples of specific vagueness.

Creighton and Young (2005) point to the recent efforts of the National Council of Professors of Educational Administration (NCPEA) as steps towards improving the field. They see the Rice University/Connexions Project as potentially making the knowledge base more accessible in one location. They see it as becoming a vehicle through which

changes in the profession will be articulated so that the knowledge base does not exist as an archaic and static body. They also see it as changing the system where in the knowledge base exists as primarily the work of experts in the field of preparation. The change here will be, presumably, that more practitioners will contribute to the knowledge base. One question that arises here is how this site and its content will become articulated to practitioners so that their expertise and experience can be mined. Though members of the NCPEA and visitors to the website of the NCPEA find information on the project, the average administrator may not.

Doctoral dissertations provide researchers with their best examples of research on the importance of data to school administrators. Pre-NCLB writing by Etheredge (1999), Jones (1999), and Polnick (1999) indicate that the data demands of school administrators are very high. Each conducted studies for the purpose of identifying situations where principals on different levels analyzed data. Their work highlights skills that administrators need to be successful practitioners. The three identified 482 situations where administrators employ data in decision making.

The writing of Etheredge (1999), Jones (1999), and Polnick (1999) supports the writing of James McNamara (1996, 2000, 2001) that suggests teaching statistics and data courses geared specifically to school leaders. In fact, each recommends a model of coursework in statistics and data analysis developed by McNamara. The works were completed prior to the No Child Left Behind legislation, and it is likely that the data demands on administrators have increased to a level even greater than quantified by the researchers.

McNamara, Erlandson, and McNamara (1999) wrote that principals have traditionally not been trained in research and statistics. They point to a gap between the needs of the professions and the skills highlighted in Thompson (2001). McNamara and Thompson (1996) call for a change in the way that principals are taught statistics. The seven key elements of their proposal are to emphasize analysis methods that examine real, illustrating concepts by use of real data, focus on descriptive statistics, learn and use statistics to describe univariate distributions, use exploratory data methods, stress visual displays in analysis and communication, and be able to employ skills to analyze atypical data. Later writing by McNamara (2000, 2001) continues to push this dialogue.

McNamara (2000) alludes to an element of the theory/practice gap addressed by other writers when discussing the fact that traditional statistics courses stressing analysis of things devoid of relevance to school administrators. He points to research by others that highlight the fact that schools have plenty of data, but do not use it to improve instruction. The premise he makes is that they do not know how. He points to a weakness in the early National Policy Board for Educational Administration (NPBEA) interpretations in Thompson (1993). The NPBEA did not go far enough to specifying skills that principals would truly need, and that the generic nature of the recommendations did not identify the skills requisite to the position. The second edition of *Principals for our Changing Schools* (Thompson, 2001) does specify these skills, and includes many of the guidelines of McNamara and Thompson (1996).

Among the skills McNamara (2000) identifies for principals is the need to "report their findings in a way that is not dependent on stakeholders having an in-depth knowledge of statistics" (p. 381). This implies that principals need to be able to speak in

terms that the lay person can understand. They need to use distribution skills to report priorities as such.

McNamara (2001) expounds further on the need for statistical and data analysis skills among principals with 10 recommendations. These begin with recommendations to adopt the seven guidelines presented by McNamara and Thompson (1996). They continue on to include coursework in qualitative methods. Interestingly, the 2001 recommendations include the premise that principals should be able to prepare written descriptions of the observations based on research. Other recommendations are to university professors to include courses with immediate applicability to the workplace and courses that are field based and in-service in addition to pre-service. The final recommendation is that doctoral students add to the body of knowledge in educational administration by linking data and statistics skills to the real world. In essence, this last recommendation is a call to begin closing the theory-practice gap previously identified. McNamara, like Thompson and other writers, falls short of recommending that all graduate administration preparation programs require statistics. For those that do, his premise is that his model would be better than traditional models for preparing administrators for the real work of improving schools.

The National Conference of State Legislatures (NCSL, 2002) acknowledges that leadership is important for lasting an effective school reform. Furthermore, they write that the role of the school leader has expanded, and that, due to increased accountability in the wake of NCLB and standards-based education, "School leaders must place more emphasis on their roles as instructional leaders, data analysts, and curriculum developers" (NCSL, 2002, p. 2). The Task Force cites research that reinforces the notion that there is

a theory/practice gap in educational administration. The work of NCATE and ISLCC to develop standards for administrator preparation is highlighted by the Task Force. By 2002, 37 states had adopted the ISLLC standards.

The ISLLC identifies six standards for school administrators. Key knowledge, dispositions, and performance indicators are identified for each. Standard One deals with the administrator as the leader of a learning community. In this standard, the leader is said to have knowledge of "information sources, data collection, and data analysis strategies" (Council of Chief State School Officers, 1996, p. 10). The leader is expected to use data to establish goals and vision. In Standard Two, the leader is expected to make decisions based on information and research. Taken as a whole, the standards are meant to ensure an educational leader who exercises strong leadership, management, and communication skills in all areas of education.

The *Standards for Advanced Programs in Educational Leadership* published by the NPBEA (2002), lists seven standards for building and district administrators. Like the ISLLC standards, these standards are intended to identify the skills and knowledge base that practicing administrators need to perform their jobs. The standards are listed as performance objectives for programs, implying that a person who completes a program should meet or exceed the standard. Each of the standards directly or indirectly indicates the importance of data use to school improvement. Standard One addresses data use on a building and district level, signifying that candidates use data decision making for vision development, articulation, implementation, stewardship, and community involvement. Standard Two addresses, among other things, instructional leadership and calls on leaders to use data to meet accountability requirements.

Hess (2003) writes "In a new world of schooling marked by data-driven decision making, performance based evaluation, nontraditional teachers, and revolutionary technology, our educational leaders are faced with unprecedented challenges" (p. 1). The standards are meant to meet these challenges. Administrator preparation programs are the vehicles through which they can and should.

Administrators are not being trained for data use. Research by the AASA (2002) indicated a skills deficit among school leaders in the area of data use. Superintendent respondents called for in-service training to bridge the knowledge gap. A study of 1543 practicing principals and assistant principals in Virginia was conducted in order to assess the state of the profession and address issues germane to the perceived shortage of principals in the state. Overwhelmingly, principals expressed their perception that their graduate training prepared them well for the principalship (DiPaola & Tschannen-Moran, 2003, p 50). Graduate preparation was cited as the most important experience in helping principals in their position. The survey also identified areas of weakness and concern in the preparation. Over two thirds of the respondents indicated a need for professional development in research and data-driven decision making (p. 52). Though the survey was intended to address issues of concern in regards to the principal shortage, its conclusions are of great import to this discourse. From the response to the items regarding graduate preparation, respondents indicated the preparation was invaluable to their success, yet the weaknesses identified indicate an issue here. The respondents skills needs may not have been met by their graduate preparation. Worse, they do not see their preparation as a cause of this gap.

The increased emphasis on data use in the NCLB era compounds this factor. As these skills become more crucial to the effective job performance as a school administrator, a greater need for preparation is warranted. This study points to a need for professional development among practicing administrators. It further illuminates the need for a requirement for graduate programs to teach statistics or data use skills to all who desire certification or licensure.

Licensure requirements are determined by state education officials. In New York State, the New York State Education Department sets certification requirements for teachers and administrators alike. As of the date of this writing, in order to be certified as a building administrator in New York, one would have to meet the certification requirements for a School Administrator and Supervisor (SAS). To hold this certification, an individual must hold a baccalaureate degree from an accredited university or college. He or she must earn 18 graduate credits in educational administration and at least additional 12 graduate credits in any area. He or she must complete a supervised internship, and must have been employed in the field of education for at least 3 years. Finally, he or she must have completed workshops in School Violence Prevention and Child Abuse Identification and have been subjected to a fingerprint clearance procedure. (NYSED, 2005a) There is no stipulation about what area of administration must be studied. There are no specific coursework requirements for certification.

In order to be certified as a school district administrator, one would have to hold School District Administrator (SDA) certification. This requires a baccalaureate degree, a master's degree, 24 graduate credits in administration, 36 additional graduate credits, an

internship, and the workshops and clearance above (NYSED, 2005b). Again, there is no stipulation as to what coursework should be required, despite the fact that the Commissioner of Education and the Board of Regents have adopted new guidelines for preparation programs that include vague content description requiring basic knowledge required for each of the certifications (NYSED, 2003).

The changes adopted by the Board of Regents in July 2003 stipulate several areas of knowledge for administrators. The Board stops short of requiring anything specific in the way of coursework. It calls on preparation programs that prepare school leaders to "Complete studies sufficient to demonstrate, upon program completion, the knowledge and skills necessary to perform" (Duncan-Poitier, 2003, p. 2) a lengthy list of tasks. These include curriculum and instruction, assessment, student and staff development initiatives, community relations, budget development, and facilities planning through development of the following skills, vision, collaboration, communication, planning, ethics, accountability, innovation, supervision and evaluation of staff, a legalistic framework, and a plan for continual self-improvement and reflection. (Duncan-Poitier, 2003).

New York State Education Department publications on administrator preparation list nine requirements for school leaders (NYSED, 2003). Among these is the requirement that leaders embrace accountability at all levels. It calls on them to utilize data for action research. In the preliminary documentation for new certification requirements, data and data-driven decision-making are mentioned repeatedly. According to this brief, basic preparation should include instructional evaluation and should address data mining and analysis as well as "data-driven decision making for the

improvement of student achievement" (NYSED, 2002, p. 18) The state falls far short of specifying any required coursework in data or statistics.

Interestingly, the requirements for credit hours have not changed from the old certification requirements. It is unclear how a "program" would be able to fulfill these content area requirements in as few as 18 or even 24 credits. The new regulations do place responsibility for program development in the hands of universities and colleges, and stipulate that after September 2004, no persons will be admitted to a program that would culminate in the old certifications. Nonetheless, as Hess (2003) wrote, "Effective licensure requires knowledge based standards against which aspirants can be measured to determine adequacy. Leadership, in education and elsewhere, lacks such concrete benchmarks" (p. 3). This is clearly the case in New York State. The *Instructions for Requesting Registration of Programs Leading to Certification in Educational Leadership –Based on 8NYCRR 52.21(c)* lists the nine essential skills for both building and district leadership (NYSED, 2003). The state does not specify any coursework to meet these skills.

McNamara and Thompson (1996) aptly indicate that individuals seeking professional degrees in many areas are required to complete a course in basic statistics. The reality is that in many programs there is no such requirement for educational administration programs. As Thompson (2001) states, many universities do not offer coursework in statistics or data analysis as a part of administrator preparation programs.

It is clear from the extant literature that data use is widely viewed as crucial component of school improvement and achievement. Research on school improvement permeates the field. Administrator preparation and training has been addressed over the

past decades, though, as Murphy and Vriesenga (2004) point out, there is very little substantive research on the subject. Research on administrator training for data analysis is virtually nonexistent. The dearth indicates a further need for this.

Literature Connecting Attitudes and Perceptions to Practice

Over the past 30 years, a considerable amount has been written on how individual's beliefs are connected to their practice. Argyris and Schon (as cited in Bolman & Deal, 2003) wrote of the difference between what people say they will do and what their actual actions are. "Individual behavior is controlled by personal theories for action" (Bolman & Deal, 2003, p. 163). According to this work, there exists a discrepancy between an individual's espoused theories and his or her theories in use.

Fishbein and Ajzen (1975) and Ajzen (1980) examined this concept deeper. They posited that individuals act in a rational matter and consider the consequences of their behaviors before acting. One's intention to exhibit a behavior is associated with their actually exhibiting it. This formed the crux of the theory of reasoned action. Furthermore, an individual's attitudes correlate directly with his or her actions. A person with a favorable attitude toward a behavior would be likely to exhibit that behavior.

The theory of reasoned action was expanded by Ajzen (1991) to the theory of planned behavior. This expansion included the element of perceived behavioral control as an additional influence on the behavior. This is the notion of the individual's belief of how difficult, or easy, exhibiting the behavior will be. If the individual believes that performing the task is well within his or her ability, he or she will be more likely to exhibit an intention to perform it. Ajzen further indicates that this perceived behavioral

control often becomes an actual behavioral control. "Perceived behavioral control may not be particularly realistic when a person has relatively little information about the behavior, when requirements or available resources have changed, or when new or unfamiliar events have entered the situation" (Ajzen, 1991, p. 184). Simply summarized, one's intentions to exhibit a behavior, which is determined by attitude towards the behavior, norms regarding the behavior, and perceived behavioral control, is a strong predictor of the behavior. As one begins to connect attitudes and perceptions to practice, it becomes apparent that information and skills germane to successfully exhibiting the behavior are crucial.

De Montalvo (2003) examined the theory of planned behavior in the context of spatial data (geographic information) sharing. She found that the attitudes of individuals within organizations regarding spatial data sharing as well as norms associated with spatial data sharing were predictors of intention to engage in the behavior. She concluded that the theory is applicable to the discussion of spatial data sharing as a behavior. The theory can be applied to examining the degree to which various agents will become data sharers. "Owing to the predictive power of the intention construct, understanding the antecedents of intentions implies understanding the behavior" (p. 21). She concluded that those agents with an intention to act, would, in fact, act in the exercise of spatial data sharing.

There is a general lack of research and writing on the application of the theory of planned behavior on specific tasks of administrators in schools. There is, however, a body of literature that examines the relationship between attitudes and behavior intentions in other fields. While much of this centers on the health and psychological

fields (Ajzen & Timko, 1986; Beale & Manstead, 1991; & Goden, Valois, Shephard, & Desharnais, 1987) a relatively small body of literature exists on applications to schools and education.

Ballone and Czerniak (2001) examine the effect of teachers' beliefs regarding learning styles on successful science reform initiatives. They point to a number of studies on science education and the theory of planned behavior that indicate that attitudes influence teachers as well as students intentions and thus impact behavior. Their study found that there was a positive attitude among teachers in regards to using varied instructional modalities to teach to different learning styles. Furthermore, they found that there were significant perceived behavioral controls that may impact negatively on the ability of the teachers, despite their own attitudes, to exhibit the behaviors. In addition, the study showed that teachers are influenced by others who are closely associated with the school. They conclude that it is essential to instill positive attitudes towards the behavior, in this case learning styles, and to involve participants in "positive experiences that show how they can implement these strategies" (Ballone & Czerniak, 2001, p. 21). They recommend further research on the impact of teachers' beliefs on their practice.

Preston (1994) examined the theory of planned behavior in the context of school administrators' use of computers. As part of his doctoral dissertation research, he conducted a study of practicing school administrators in suburban New York. He found that the perceived behavioral control elements of perceptions of the usefulness of computers, computer skills, and interest in and availability to use computers would likely increase administrators use of computers.

Crowley (1989), in her dissertation study, examined the theory of planned behavior in the context of school principals' implementation of in-service action plans. She attempted to ascertain the influences on intention to implement the plans as well as if there was a connection between the intention and the actual implementation. She found, among other things, that attitudes as well as actual behavior controls of thinking preferences, action control, and skill and experience were predictors of intention to implement. Furthermore, she concluded that the thinking preferences and action controls were predictors of the behavior. In essence, several predictors of intention were effective predictors of the behavior.

Smarkola (2004) examined the connection between teachers' (both pre-service student teachers and classroom teachers) stated intentions regarding and actual usage of computers in the classroom. She found that ease of use as well as perceptions of usefulness of computers were significant predictors of the intentions of teachers to use the computers. Furthermore, the intentions were significant predictors of usage of the computers by both groups of teachers. She noted that the positive attitude of both groups towards computer usage was also an effective predictor.

While no study has been conducted to analyze predictors of school administrators' intention to use data or data analytical skills, research in other areas indicates that there may be a connection between the attitudes of administrators regarding data, the subjective norms within the field towards data, and the perceived behavioral control and such intention by school administrators. Positive experiences or exposure to research that highlights the gains that have been made through data analysis may impact the attitudes. Forces within schools, districts, and states may increase the pressure on

administrators to engage in data use, effecting subjective norms development. Skills development through coursework or other professional development may increase the likelihood of successful completion of data analytical tasks. These factors, which have been identified in other fields as predictors of intention, may also predict the likelihood of administrators engaging in data analysis.

Chapter III Methodology

Introduction

This study had three distinct parts. The first phase of the study was to develop an original instrument to assess practicing administrators' perceptions of data along three themes. The second phase was to assess the validity of this instrument. Finally, the third phase was designed to ascertain the reliability of this instrument.

Development of the Instrument

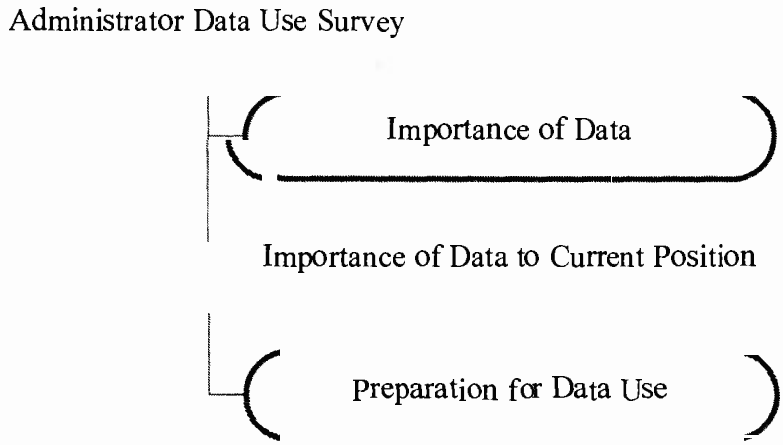
The first step in developing the instrument was to review the literature. Based on this review, the researcher identified three gaps or areas of investigation. The literature review indicated three areas of investigation: 1) administrators' perceptions of the importance of data to school improvement, 2) administrators' perceptions of the importance of data to their position, and 3) administrators' perceptions of the degree to which their graduate preparation in educational administration prepared them for data use in their position. As none of these had been explored in any great detail, the researcher placed the emphasis here. The researcher developed a conceptual framework of the areas of investigation for the instrument.

Figure 1 illustrates the theorized construct framework for the ADUS. The researcher theorized that the ADUS measured three distinct themes. As can be seen from this diagram, Section I was designed to address the Importance of Data Use construct. A series of items were written to address each of the constructs. Section II was designed to address the Importance of Data to Current Position. Finally, Section III was developed to

examine Preparation for Data Use. The researcher theorized that the items developed for each construct would, through factor analysis, converge on the appropriate construct, while also diverging from other constructs.

Figure 1

Theoretical Framework for the ADUS



The researcher based the development of the items on the writing of Rea and Parker (1997). For the questions in the questionnaire, the researcher chose to use closed-ended questions organized around a 5-point Likert scale. The researcher surmised that this would ensure uniformity of responses on the questionnaire as well as permit ease of data entry for analysis. Furthermore, the use of a 5-point as opposed to a 4-point or 6-point scale afforded respondents the opportunity to provide an answer indicative of neutrality. Two of the demographic information questions were closed ended also, for reasons stated above. One demographic question (years experience in educational administration) was stated as an open-ended question. This allowed for post administration coding into discrete categories of approximately the same size, depending on the nature of the respondents' experience.

Based on the researcher's investigation of the literature as detailed in chapter 2, the researcher drafted a battery of items for the instrument. The items were developed to assess practicing administrators' perceptions of the importance of data to education, the importance of data to positions in educational administration, and the degree to which practicing administrators deemed their preparation for data use as adequate. The researcher originally developed 51 items as well as three demographic questions. Over the course of development, a period of 5 months, several revisions were made. Questions were added to ascertain or isolate a specific perception that had been missed in the original. In total, 64 items were subjected to validity testing and norming over a period of 3 months. In the version of the ADUS sent out for norming, the researcher clustered questions that were related to a particular theme. According to Rea and Parker (1997), clustering of this nature was essential so that respondents could focus on an area without

being pulled back and forth between topics. This design element was balanced with placing similar questions within the group in random order. Rea and Parker caution that questionnaire designers should be mindful that too many sequential or closely related questions may lead to reflexive responses that have not been given appropriate consideration. In essence, the respondents may reply to questions without reading them if they have been patterned, correctly or not, to expect questions on a particular subject.

Cognizant of the time constraints that practicing administrators face, the researcher constructed the survey with sensitivity to this in mind. The researcher designed the draft instrument for a completion time of approximately 15 minutes, excluding reading accompanying explanatory documentation. This is in line with the suggestions as set forth in Rea and Parker (1997).

Construct Validity

Construct validity refers to the degree to which an instrument measures a specific theme or construct. The guiding assumption in the development of this instrument was that the items on the instrument addressed one of the three themes. For each theme, there were multiple questions on the instrument.

Subjects for construct validation.

The subjects for the first level of construct validation included eight individuals who have a particular expertise in educational administration. The researcher selected the members of this panel because collectively, the group brought a variety of lenses or perspectives to the analysis. Seven of these individuals were university professors in educational administration who had written on subjects such as administrator preparation,

data use in school, statistical instruction for school administrators, and principal preparation. The eighth panelist was a school administrator whose position is integrally tied to data use. In addition, she had presented at conferences on the importance of data analysis. The professors were selected because the researcher, during the literature review, had read work from each and concluded that each would add to the depth of the analysis. The administrator had presented to a conference which the researcher had attended. The researcher concluded that a practicing administrator's perspective would be a valuable perspective in the analysis of the instrument.

The seven professors were solicited via electronic mail or United States mail in the spring and summer of 2005. Each was informed of the purpose of this study and was asked if he or she would be interested in providing feedback to the researcher in regard construct validity. After approval to undertake the study was granted by the Institutional Review Board, construct validation commenced.

Construct validity methodology.

In order to ascertain the degree to which the instrument had construct validity, the construct validation panel was asked to examine the questions within their grouping in order to analyze whether the items listed under each theme actually reflect the particular theme. This jury included professors in the field of administrator preparation as well one practicing school administrator whose position is tied integrally to data analysis. The panelists were sent a copy of the original draft instrument, a Construct Validity Letter of Solicitation, an informed consent form, and two different Construct Validity Assessment Forms (Appendix A & Appendix B). Approximately 1 week separated the two assessments.

The first form asked the jurors to analyze the items to determine under which theme each item fit. The items were listed in alphabetical order in order to remove them from the theme to which the researcher assigned them. Panelists were asked to place a mark under the column corresponding to the theme the panelist believed was appropriate for each item.

The second form asked panelists to examine a draft of the instrument and evaluate the items in the researcher theorized theme context. Each was asked to comment on the degree to which the items were appropriately placed by theme. In addition, each was asked to assess the degree to which the items contributed to the construct being assessed. Subsequent to this analysis, the instrument was refined and revised.

In addition to the use of a panel of experts to assess the construct validity, the researcher conducted statistical analysis to assess the construct validity. Using the norming sample data that was used for reliability testing, a factor analysis was conducted to determine the degree to which the instrument had construct validity. The data from the norming sample was subjected to a principal component factor analysis, using a Varimax extraction. A Kaiser-Meyer-Olkin Measure of Sampling Adequacy (MSA) was determined. In addition, a Bartlett's Test of Sphericity was conducted. A rotated component matrix was examined to determine the convergence of related factors as well as the discrimination from dissimilar factors. Based on the data, a number of factors were identified. The factors contributing to the greatest amount of variance in the responses were retained. All other factors, and associated items, were deleted. To assess construct validity, the results of the factor analysis was compared to the hypothesized theoretical framework developed by the researcher.

Content Validity

Content validity refers to the degree to which an instrument measures what it was designed to measure. According to Leedy and Ormrod (2001), an instrument has high content validity if the items "reflect the various parts of the content domain in appropriate proportions" (p. 98). The ADUS was subjected to a multilevel content validation process.

Subjects for content validation.

The subjects for content validation were the same panel that was used to assess construct validity. Again, seven of these individuals were university professors who taught in administrator preparation programs or who taught statistics to administrator candidates. The eighth was a school district administrator whose position was tied to data and who had presented on data at conferences. The method of selection and solicitation are described above.

Content validity methodology.

In order to assess the content validity of the instrument, the researcher solicited feedback from a content validation panel. This jury was asked to assess the degree to which each item in the survey and its collective totality measures that which it was intended to measure. A content validity assessment form (Appendix C) was sent to these eight experts, along with a draft of the instrument, Content Validity Letter of Solicitation, and an informed consent form. Six of the eight experts provided feedback on content validity.

The panel recommended changing several items in order to add to the content validity of the instrument. Specifically, the panel recommended adding a question that

asked administrators their perception on whether their school districts use data to identify individual student weaknesses as well as a question on whether school districts use data to track improvement of individual students. The panel recommended clarifying the item that asked for administrator beliefs on whether schools or districts that effectively used data to improve student achievement are better able to become high performing schools or districts. The panel recommended deleting a question that asked "As a result of my preparation in educational administration, I feel confident in my ability to analyze the results of at-test, correlation, ANOVA, regression, and chi square." Finally, the panel recommended adding questions to ascertain specific data analytical skills that should be taught in graduate preparation programs. The items that were added asked for perceptions on the skills of statistical analysis, data analysis, data use for program evaluation, communication of data analysis, presentation of data analysis in multiple formats, data use for program planning, use of data warehouse software, and use of statistical analysis software. The researcher agreed with these suggestions and made the changes as recommended. In order to assess content validity of the new items, a second packet was sent to the same jury. This packet contained the revised draft of the instrument and a second content validity assessment form (Appendix D).

Criterion Validity

"Criterion validity is the extent to which the results of an assessment correlate with another, presumably related measure (Leedy & Ormrod, 2001, p. 98). No other instrument for this assessment exists. The researcher utilized a criterion validation panel for this purpose.

Subjects for criterion validation.

The criterion validation panel included eight practicing superintendents from seven states representing five regions in the United States. As chief educational officers of a school district, superintendents are tasked with evaluating their administrative staffs on a variety of levels. Two of these superintendents were students in a doctoral program at Seton Hall University. Two of these superintendents were colleagues of different students in a doctoral program at Seton Hall University. The other four were identified from a Google search of the 50 largest school districts in the United States. The researcher selected districts from different geographic regions in order measure the instrument against professional practice standards throughout the nation.

Criterion validity methodology.

Each superintendent was sent a packet containing a Criterion Validity Letter of Solicitation, an informed consent form, a Criterion Validity Assessment Form (Appendix E) and a copy of the final draft of the instrument. Each was asked complete the criterion validity assessment form. This form asked superintendents to consider whether the items on the instrument match the professional requirements for their administrative staff when they are hiring or evaluating, as well as the standards of professional competency in the field.

Face Validity

"Face validity is the extent to which, on the surface, an instrument looks like it's measuring a particular characteristic" (Leedy & Ormrod, 2001, p. 98). The researcher assessed the face validity based on the feedback of a panel of practicing school

administrators. As practicing administrators this panel was viewed as representative of the typical individual who would be a respondent to the instrument

Subjects for face validation.

The subjects for face validity were a panel of practicing school administrators. This panel included nine practicing administrators from seven states, representing five regions of the United States. Four of these panelists were students in a doctoral program in educational leadership, management, and policy at Seton Hall University. The other five were practicing principals of schools identified through an internet search of the largest 50 school districts in the United States. They were selected because it provided a national perspective and analysis of the items on the instrument.

Face validity methodology.

The researcher sent a copy of the final draft, a Face Validity Assessment Form (Appendix F), Face Validity Letter of Solicitation, and an informed consent form to each of the panelists. This form asked each panelist to answer five short questions for each theme. Through this form, each examined the items on the instrument for clarity and flow. Each commented on the degree to which the items make sense in the context of gathering this data. Each commented on the ability of the items to obtain the information that the instrument seeks to collect. Each indicated the amount of time, in minutes, that the instrument took to complete.

Reliability

Reliability refers to the degree to which the results gleaned from the use of an instrument are repeatable given identical administration circumstances. Zeller and

Carmines (1980) indicate that "a reliable measure is repeatable and consistent" (p. 48). The ADUS was analyzed for both split-half and internal reliability.

Subjects for reliability testing.

The norming population for determining the reliability of the instrument includes practicing administrators in New York State. A sample of 400 administrators from the New York State Education Department list of 6861 members was randomly selected. This number was deemed sufficiently large to assess scale reliability based on a power of .90 and an effect size of .30 at the .05 level of significance.

Reliability methodology.

In mid-December, 2005, the researcher sent a copy of the draft instrument, Reliability Letter of Solicitation, and informed consent form to each of the 400 random subjects identified from the database. Each was asked to complete the instrument and return it in the enclosed pre-addressed envelope. Ten days later, a postcard was sent to each of the subjects, reminding them of the study, asking for participation, and thanking those who had responded already.

In order to assess internal reliability, a post administration analysis was conducted. The Cronbach's α was calculated for the entire battery of 27 items that had been retained as a result of construct validation. In order to further assess reliability, the Spearman-Brown split half reliability coefficient was calculated. For this analysis, the even items were compared to the odd items. Finally, the Cronbach's alpha was calculated for each of the four retained extracted factors of the instrument. This analysis was used to determine the level of internal reliability. According to Nunnally and Bernstein (1994), a coefficient $\alpha > .70$ would be acceptable to determine internal

reliability. Desiring to be more conservative when assessing reliability, the researcher established a target range of $\alpha \geq 80$.

Data Analysis

Construct validation.

A factor analysis was conducted using the responses from the norming sample for reliability for the entire battery of 64 items that were sent out for content, criterion, and face validation. A rotation was utilized to extract distinct factors from the data. The researcher compared the extracted factors to the hypothesized theoretical framework.

Reliability.

Cronbach's α was calculated for the entire battery of items as well as for each extracted factor. In addition, Spearman-Brown split-half reliability coefficient was calculated to determine internal reliability of the assessment. The target Cronbach's alpha and Spearman Brown coefficient range of $\alpha \geq .80$ was pursued.

Chapter IV Findings and Results

Validity

Construct validity.

Two separate methods were used to assess construct validity for the Administrator Data Use Survey(ADUS). A multiphase analysis of the instrument by a construct validation panel was conducted. In addition, a factor analysis was conducted using the data from instruments that were returned by the norming sample.

The panel was asked to analyze the items that the researcher created. The first analysis asked the panel to categorize the items using an item mapping sheet. Packets were sent to eight potential panelists. The panelists were asked to place a mark under the theme they deemed was reflected in each item. Five panelists responded to the solicitation for this analysis. Of these, one panelist completed the analysis incorrectly. This panelist provided responses to each item for each category on a 5–point scale. As this provided data that could not be analyzed along with the other four, correctly completed responses, this response was omitted from this analysis.

Items where there was strong agreement among respondents, evidenced by agreement of at least three panelists, were retained. On one item, there was no agreement among panelists. This item, "I feel that others who work in my position frequently use data in their position," was seen as not addressing any of the themes. Upon reflection based on the feedback of the panel, the researcher agreed that this item was not appropriate to the analysis. This item was removed. With this exception, the responses

of the panel mirrored the categorization of the researcher in the original draft. The responses of this panel are summarized in Appendix G.

The panelists were sent a second analysis tool for construct validation. Each was asked to comment on the items on the original draft. On this version, the items were placed under the theme for which each was developed. Again, this categorization was supported by the item mapping of the panel in the first construct validation assessment. Five panelists responded to this solicitation. One returned the draft instrument, completed, but returned the assessment form blank. The other four provided narrative comments on the degree to which the items in each construct/theme were appropriate to and reflective of the theme about which the researcher was concerned. These comments are summarized in Appendix H.

Based on the feedback of the construct validation panel, adjustments to the instrument were made. One item was deleted as there was no strong agreement among panelists that it was reflective of any construct/theme. There were no other changes in the instrument as a result of the construct validation panel.

In addition to the construct validation panel, construct validation was assessed through factor analysis of data gathered from the norming sample. For the factor analysis, a principal component analysis was done of the full battery of 64 items of the ADUS using a Varimax rotation. The Kaiser-Meyer-Olkin MSA was computed. In addition, Bartlett's Test of Sphericity was run.

The Kaiser-Meyer-Olkin MSA was calculated at .723. This value fell into the moderate range (Kim & Mueller, 1978) and was certainly above the .5 range of acceptability for factor analysis. The Bartlett's Test was significant ($p < .000$, df 2016).

As the *p* value was less than .05, the researcher concluded that the data were appropriate for factor analysis (Kim & Mueller, 1978).

The factor analysis resulted in the identification of 15 discrete factors. These factors accounted for 78.306 % of the variance. Table 1 shows the Total Variance Explained.

Table 1

Total Variance Explained

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	%of Variance	Cumulative %	Total	%of Variance	Cumulative %
1	14.211	22.205	22.205	7.808	12.200	12.200
2	10.559	16.498	38.703	6.039	9.436	21.636
3	4.791	7.486	46.189	5.755	8.992	30.628
4	3.060	4.781	50.970	4.906	7.666	38.294
5	2.530	3.953	54.923	4.651	7.267	45.561
6	2.223	3.473	58.397	3.297	5.152	50.713
7	1.971	3.079	61.476	2.971	4.642	55.355
8	1.756	2.743	64.219	2.903	4.536	59.891
9	1.689	2.640	66.859	2.152	3.362	63.253
10	1.487	2.324	69.183	1.995	3.117	66.370
11	1.405	2.195	71.378	1.812	2.831	69.201
12	1.226	1.916	73.294	1.797	2.808	72.009
13	1.137	1.777	75.071	1.583	2.474	74.483
14	1.061	1.659	76.729	1.279	1.998	76.480
15	1.009	1.577	78.306	1.169	1.826	78.306

The factor analysis extracted all factors with eigenvalues greater than 1.0. Component 1 accounted for 22.205 % of the variance (eigenvalues= 14.211). Component 2 (eigenvalue= 10.559) accounted for 16.498. Component 3 (eigenvalue= 4.791) accounted for 7.486 % and Component 4 (eigenvalue= 3.060) for 4.781 %. Cumulatively, the first four factors accounted for 50.970 % of the total variance. Table 2 illustrates this data.

Table 2

Variance Explained– Components 1 through 4

	Initial Eigenvalues		
Component	Total	% of Variance	Cumulative %
1	14.211	22.205	22.205
2	10.559	16.498	38.703
3	4.791	7.486	46.189
4	3.060	4.781	50.970

The factor analysis produced a rotated component matrix. The extraction was conducted so as to suppress factor loadings below .3. This was done to make the examination of the component matrix less arduous. This suppression was not viewed as negatively effecting the analysis as the factor loadings are common factor correlations. In correlations, coefficient values < .30 are seen as implying little, if any correlation (Hinkle, Wiersma, & Jurs, 2003). Suppressing these values would have no impact on the

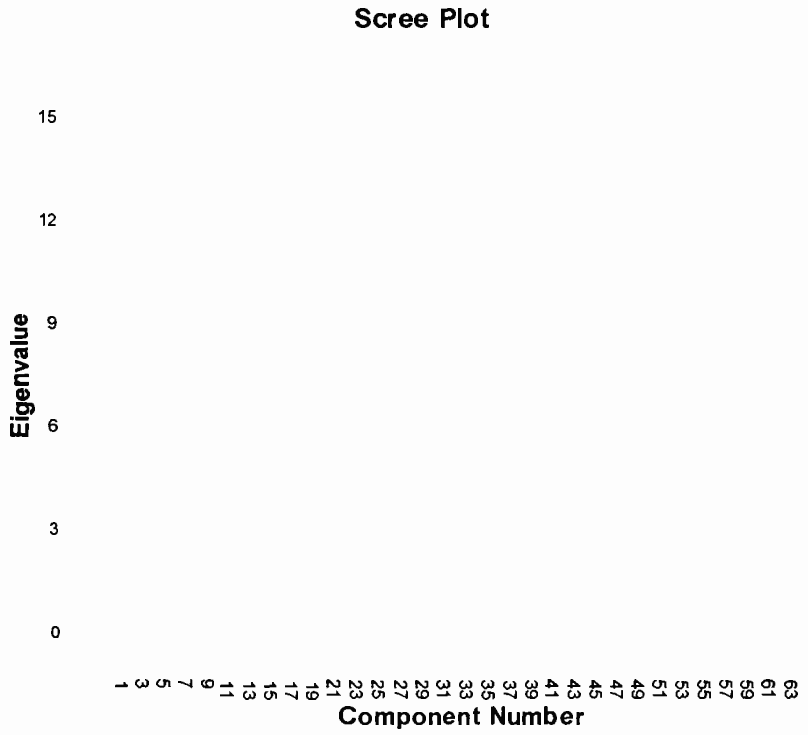
findings or the determination of construct validity. Appendix I contains the full rotated component matrix for this data.

In order to ascertain the construct validity of the instrument, the extracted components were compared to the researcher hypothesized framework. It was hypothesized that the researcher framework would parallel closely the components extracted through factor analysis.

The ADUS was developed to address three themes, corresponding to four distinct constructs: 1) the importance of data, 2) importance of data to current position, and 3) preparation for data use. Fifteen components with eigenvalues> 1.0 were extracted through the factor analysis. The scree plot in Figure 2 shows the eigenvalues of each of the sorted factors.

Figure 2

Scree Plot for Factors Extracted from ADUS



Based on the analysis of the rotated component matrix as well as the structure of the scree plot (Cattell, 1966), the first four components were retained and examined them for construct congruency to the hypothesized framework.

Component 1 had ten 10 loaded. These items centered on respondents' perceptions of their graduate preparation for data use. Seven of these items loaded at values greater than .70, indicating a high correlation (Hinkle et al., 2003). One of the items was loaded with a value of -.697. This indicated a negative correlation to the construct. None of these items was cross loaded to another retained factor. Table 3 shows the items that were extracted as part of component 1 along with their associated load values. These items formed the Assessment of Graduate Preparation Factor.

Table 3

Items in the Assessment of Graduate Preparation Factor (Loading Value).

A. My graduate preparation in educational administration prepared me for analysis of data from a variety of sources. (.835)

B. In my graduate preparation in educational administration, I learned to use a statistics software program to analyze data. (.822)

C. My graduate preparation in educational administration prepared me to effectively use data for program evaluation. (.821)

D. In my graduate preparation in educational administration, I learned to interpret data reports from a variety of sources. (819)

E. My graduate education in educational administration prepared me for the data analysis, interpretation, and communication challenges in education brought about by the standards movement and/or the NCLB legislation. (.765)

F. My graduate preparation in educational administration prepared me to effectively use data for planning. (.756)

G. My graduate preparation in educational administration prepared me to communicate data analysis to multiple constituencies. (.730)

H. In order to meet the data use (analysis, interpretation, and communication) requirements of my current position, I had to learn on the job. (-.697)

I. My graduate preparation in educational administration required that I take coursework in statistics and/or data analysis. (.614)

J. In my graduate preparation in educational administration, I took one or more courses in statistics and/or data analysis. (.594)

Component 2 had six items loaded. These items centered on respondents' perceptions of data use skills that administrators felt should be taught in graduate preparation programs. All of these factors loaded at values greater than .7, implying a high correlation to the factor (Hinkle et al., 2003). Two of these items cross loaded to another retained factor, though at relatively low levels. The item asking respondents to comment on the fact that administrator preparation programs should teach the presentation of data analysis in multiple formats loaded at .832 to the second factor, and at .334 to the third. The item asking respondents to comment on the fact that administrator preparation programs should teach data use for program planning loaded at .790 and .301. Both of these items were retained in the factor. Three things influenced this decision: 1) the high load value to the extracted component, indicating a strong correlation to the component was important to this decision; 2) each of the other four items that loaded into this component dealt with skills that administrators should be taught; and 3) relative to the high load of the extracted factor, the cross load was not that high. A correlation of .334 or .301 is on the low end of the low correlation range (Hinkle et al., 2003). Table 4 shows the items that were extracted as part of component 2 along with their load values. These items formed the Requisite Skills for School Administrators Factor.

Table 4

Items in the Requisite Skills for School Administrators Factor (Loading Value)

A. The following skills should be taught in administrator preparation programs - communication of data analysis. (.933)

B. The following skills should be taught in administrator preparation programs - presentation of data analysis in multiple formats. (.832)

C. The following skills should be taught in administrator preparation programs -data analysis. (.827)

D. The following skills should be taught in administrator preparation programs -data use for program evaluation. (.821)

E. The following skills should be taught in administrator preparation programs - statistical analysis. (.791)

F. The following skills should be taught in administrator preparation programs -data use for program planning. (.790)

Component 3 had 10 items loaded. These items centered on respondents' general perceptions of the importance of data use to education. Eight of the items loaded at values greater than .50, while two did not. The two that loaded below .50 were deleted. Two of the eight loaded at values of .70 or greater, implying a high correlation (Hinkle et al., 2003). Of the eight that loaded above .50, three cross loaded with other extracted factors. One item, "In my current position, I have made recommendations to teachers about programmatic changes based on data use," loaded at a value of .647. It cross loaded with the fourth extracted factor at a value of .412. The researcher deleted this

item as it did not address the same theme as the majority of other items extracted. In addition, its cross loading with the fourth factor was high enough, relative to its load value for the researcher to question its inclusion. Another item, "Additional graduate preparation for data use would have benefited me personally," was also deleted. It loaded at a value of .572 and was cross loaded to the Assessment of Graduate Preparation for Data Analysis Construct with a value of .357. It seemed to this researcher to be better suited to that construct. It did not add to the factor into which it was extracted. Finally, the item, "I wish I had more opportunities to learn advanced data analysis techniques in my graduate educational administration preparation program," loaded at a value of .505. It was cross loaded to both the first and second extracted factors at values of .463 and .314, respectively. It was deleted as the researcher concluded from this loading that its inclusion detracted from the commonality of the factor. After deleting those items that loaded below .50 and those that cross loaded, five items remained. These five items formed the third construct, the Importance of Data Factor. Table 5 shows the items that were retained for this construct along with their load values.

Table 5

Items in the Importance of Data Factor (Loading Value)

A. I believe that data use is important to closing achievement gaps. (.816)

B. I believe that data use is important to helping all students achieve. (.809)

C. I believe that data use has become more important for addressing student achievement over the past decade. (.683)

D. I believe that schools/districts which effectively use data to improve student achievement are better able to become high-performing schools/districts. (.614)

E. I believe that one of the most important tools for improving student achievement is data use (.576)

Component 4 had eight items loaded. These items centered on respondents' general perceptions of the data tasks that are important to positions in educational administration. Six of the items loaded at values greater than .50, while two did not. The two that loaded below .50 were deleted. Three of the eight loaded at values of .70 or greater, implying a strong correlation to the factor (Hinkle et al., 2003). Of the six that loaded above .50, none cross loaded with other extracted factors. These items formed the fourth construct, the Data Tasks Factor. Table 6 shows the items that were retained for this construct along with their load values.

Table 6

Items in the Data Tasks Factor (Loading Value)

A. In my current position, I interpret data from a variety of sources. (.826)

B. In my current position, I present the results of statistical or data analysis to other administrators. (.756)

C. In my current position, I analyze data from a variety of sources. (.704)

D. In my current position, I interpret data frequently. (.672)

E. In my current position, I work with teachers to analyze assessment data to develop prescriptive plans for improvement. (.646)

F. In my current position, I present the results of statistical or data analysis to teachers. (.627)

The fifth extracted component had items that were similar to the Assessment of Graduate Preparation Factor. All five loaded with a high correlation. However, as every one was cross loaded with the first extracted component, the researcher elected not to include them. This factor would have accounted for an additional 3.953 %. Again, however, the cross loading of each item led the researcher to conclude that this was not a distinct construct and that the items could not be included.

The sixth extracted component was distinct, with items addressing respondents' assessment of the use of data in their own school or district. Seven items loaded into this construct. Only two of the items were not cross loaded with any other. Four items addressing these perceptions, with loading values of> .6 were considered for inclusion as a factor. However, as two of them cross loaded with other components, one of them with

two other components, the researcher elected not to do so. The researcher surmised that a factor with only two items that had a Cronbach's α of .615 would not add to the strength of the final instrument. This component and its items were deleted.

The seventh extracted component had two items. They addressed the same general theme as the sixth. Again, the researcher did not include this in the analysis as it had so few items. This component and its items were deleted.

The eighth extracted component had five items. These were on several topics. Four of the five cross loaded with other components. In addition, only one loaded at a value greater than .70. This component and its items were deleted.

The ninth extracted component had two items. Both addressed respondents' perceptions of graduate preparation programs in general. One loaded at a value greater than .70 and both were cross loaded with other factors. This component and its items were deleted.

The 10th extracted component had two items. Each addressed a different topic. Therefore, there was not commonality. One loaded at a value greater than .70. The other items, which loaded at .642, cross loaded with another component. This component and its items were deleted.

The 11th extracted component had one item. It addressed an element of data tasks. As this component was made up of only one item, it was not considered a construct. This component and its item was deleted.

The 12th extracted component had two items. Both addressed skills that should be taught in graduate educational administration preparation programs. One loaded at a

value greater than .70. Both items cross loaded with other components. This component and its items were deleted.

The 13th extracted component had three items. They addressed two separate topics, data tasks, and data practices in schools. No item loaded at a value greater than .70. However, two did load above .50. All three items were cross loaded with other components. Two of the items were cross loaded with two components. This component and its items were deleted.

The 14th component had one item. It addressed changes in data responsibilities. It loaded at .513 to this component, and was cross loaded at a value of .459 to the third component. This component, and its item, was deleted.

The 15th component had no items extracted to it as a primary component. It had several items that fell under it as cross loading to other components. It was not analyzed as a construct.

Sixty-four items were sent out for norming. This norming data was subjected to a factor analysis. The result of this analysis was that four distinct components could be identified. These four components accounted for 50.970 % of the variance in the responses. Twenty-seven items were retained following the factor analysis.

Zeller and Carmines (1980) indicate that one must look past the purely statistical analysis in order to assess construct validity. One must examine the extracted factors against the theorized construct map. The researcher had hypothesized that the ADUS would measure three distinct constructs: 1) Importance of Data, 2) Importance of Data to Current Position, and 3) Preparation for Data Use. The factor analysis revealed that four distinct factors emerged from the analysis: 1) The Assessment of Graduate Preparation

Factor, 2) Requisite Skills for School Administrators Factor, 3) The Importance of Data Factor, 4) Data Tasks Factor.

Though a cursory examination of these items may lead one to conclude that the extraction and the hypothesized framework are different, they were fairly congruent. The theorized construct Importance of Data was extracted as a component through the factor analysis. In addition, consideration of the theorized construct on the Importance of Data to Current Position indicates that most of the items developed dealt with specific responsibilities in the practical world of school administration. Thus, the extracted component on Data Tasks parallels closely the theorized construct. Finally, the researcher theorized that a construct on the Preparation for Data Use would be extracted. Through the factor analysis, this emerged as two separate constructs, Assessment of Graduate Preparation Factor and Requisite Skills Factor. Though the theorized framework on this construct did not parallel exactly the extraction through the factor analysis, these two factors were the first two components extracted. Collectively, they accounted for 38.703 % of the variance. It was conceivable to theorize that they would be extracted together. Preparation for Data Use has many elements, from skills to perceptions to needs. Thus, it was not surprising that a multidimensionality of this construct would emerge from the analysis.

For construct validation, the researcher considered the feedback from the panel of experts. In addition, a factor analysis was run on the 64 items. Fifteen components were extracted. The first four components accounted for over 50 % of the variance in responses.

The first component was composed of 10 items with a minimum loading of .50 that centered on a common theme. Based on this loading and the lack of significant cross loading of these 10 items with other retained items, the researcher concluded that these items formed a distinct construct, the Assessment of Graduate Preparation Factor Construct.

The second component was composed of six items with a minimum loading of .50 that centered on a common theme. Actually, these items all loaded at .790 or above. Based on this loading and the lack of significant cross loading of these items with other retained items, the researcher concluded that these items formed a distinct construct, the Requisite Skills Factor.

The third component was composed of eight items with a minimum loading of .50 that centered on a common theme. Among these, five lacked significant cross loading with other retained items. The researcher concluded that the retained items formed a distinct construct, the Importance of Data Factor.

The fourth component was composed of six items with a minimum loading of .50 that centered on a common theme. Each of these items lacked significant cross loading with other retained items. The researcher concluded that these items formed a distinct construct, the Data Tasks Factor.

Each of the four extracted factors represented a distinct construct. Each of the items loaded to its extracted factor and did not cross load to others. Based on this analysis, as well as the feedback from the panel of experts, the researcher concluded that the instrument formed from the retained items had construct validity. The reliability

statistics for each factor, as well as for the entire instrument are reported later in this chapter.

Content validity.

After construct validity assessment, a content validation panel was asked to examine the instrument for content validity. The original instrument was revised. Based on the feedback from the construct validation, the revised instrument had a total of 56 items. Again, several items had been deleted from the original and several others added to clarify or better reflect each theme. Five of the eight experts identified in chapter 3 responded to this solicitation. For the most part, the second section, the Importance of Data Use to Administrators' Current Position, was deemed to be reasonably content valid. The panel made suggestions for revision of the first and third sections of the instrument. Based on this fact, the instrument was revised.

Feedback from this panel (Appendix J) led the researcher to add several items to the instrument so that it more thoroughly reflected the three themes that the researcher intended to assess. The revised instrument, comprised of 64 items, along with the content validity assessment form was sent out again to the content validation panel. Five of the panelists responded to this solicitation. One panelist referred to repetitive items and recommended they be removed. The researcher considered each item in the context of the totality of the instrument and the research study. Based on the rationale listed above, the repeated items were retained, purposefully, as the researcher felt that each added to the robustness of the study.

Generally speaking, the final feedback from this panel (Appendix K) indicated that each of the three themes in the ADUS more thoroughly reflected the three themes of

inquiry. Panelists indicated that the revised instrument better reflected the profession. Accordingly, based on the feedback from this panel of experts, the researcher concluded that this draft of the instrument was reasonably content valid.

Criterion validity.

A panel of practicing superintendents was asked to analyze the final version of the ADUS to assess criterion validity. The makeup of this panel was described in Chapter 3. Eight panelists were asked to participate. Three completed the assessment. After a follow-up correspondence, two more responses were received, for a total of five. The feedback from this panel can be found in Appendix L. This feedback indicated that the instrument was comprehensive and detailed. The instrument was found to match the expectations of superintendents in the field. It was noted by panelists on this panel that the items in the instrument reflect what is becoming the standard for the profession. In response to a question on the degree to which the ADUS reflects criteria against which these superintendents evaluate administrators, it was noted that it very much reflected the criteria. One indicated that the instrument was comprehensive and detailed. In response to a question on the degree to which the ADUS matched the professional requirements of administrators, the superintendents, again, indicated that the ADUS was a strong instrument. Again, it was seen as paralleling the professional requirements of administrators. Finally, in response to a question on the degree to which the ADUS reflects the standards of professional competency in terms of data use, the response was positive. It was seen to strongly reflect the standards. One superintendent indicated that the level of competency identified by the ADUS was quickly becoming the standard.

Based on the feedback of this panel, the researcher concluded that the item was reasonably criterion valid.

Face validity.

A panel of practicing school administrators was asked to analyze the final draft of the ADUS to assess face validity. The makeup of this panel was described in chapter 3. Ten individuals were solicited for feedback on the ADUS. Nine responded to the solicitation. Each completed a questionnaire that was designed to evaluate the ADUS for clarity and flow. Each section of the evaluation form had five items. Part I was designed to evaluate Section I of the ADUS, on importance of data. All nine panelists indicated that they agreed that the items were clear, with seven of nine indicating that they strongly agreed that they were clear. All nine agreed that the items had a logical flow and sequence, with seven of nine indicating that they strongly agreed that the items had a logical flow. All nine indicated agreement that the items made sense in the context of research on the importance of data use in education, with seven of nine strongly agreeing. All nine agreed that the items appeared to be a good measure of administrator perceptions of the importance of data to improving student performance, with eight strongly agreeing. Finally, all nine were in agreement that the items appeared useful for collecting information on administrator perception of the importance of data to improving student performance, with eight indicating strong agreement with this statement. Table 7 illustrates the results of the analysis of the face validation panel's assessment of Section I of the ADUS.

Table 7

Frequency Table of Face Validity Assessment – Section I (N=9)

Evaluation Question	Agree	Strongly Agree	Total Agree
The items in Section I are clear	2	7	9
These items have a logical flow and sequencing	2	7	9
These items make sense in the context of research on the importance of data use in education.	2	7	9
These items appear to be a good measure of administrator perceptions of the importance of data to improving student performance.	2	7	9
These items appear to be useful for collecting information on administrator perceptions of the importance of data to improving student performance.	2	7	9

The second part of the evaluation form was designed to evaluate Section II of the ADUS, on Importance of Data to Current Position. Again, all nine panelists indicated that they agreed that the items were clear, with seven of nine strongly agreeing. All agreed that the items had a logical flow and sequence, again with seven in strong agreement. Each indicated that the items made sense in the context of research on the importance of data use to positions in school administration, with seven strongly agreeing. Nine felt that the items appeared to be a good measure of administrator perceptions of the importance of data to their current position, and that the items

appeared useful for collecting information on administrator perception of the importance of data to their current position, with eight strongly agreeing with these evaluative statements. Table 8 illustrates the results of this analysis.

Table 8

Frequency Table of Face Validity Assessment–Section II (N=9)

Evaluation Question	Agree	Strongly Agree	Total Agree
The items in Section II are clear	2	7	9
These items have a logical flow and sequencing	2	7	9
These items make sense in the context of research on the importance of data use to positions in school administration.	2	7	9
These items appear to be a good measure of administrator perceptions of the importance of data to their current position.	1	8	9
These items appear to be useful for collecting information on administrator perceptions of the importance of data to their current position.		8	9

Part III was designed to evaluate Section III of the ADUS, on Preparation for Data Use. As can be seen in Table 9, all nine panelists indicated that they agreed that the items were clear, that the items had a logical flow and sequence, that the items made sense in the context of research on the preparation of school administrators for data use, that the items appeared to be a good measure of administrator perceptions of the degree to which they feel that their graduate preparation adequately prepared them for data use,

and that the items appeared useful for collecting information on administrator perceptions of the degree to which they feel that their graduate preparation adequately prepared them for data use. On all of these items, seven of the nine panelists strongly agreed.

Table 9

Frequency Table of Face Validity Assessment – Section III (N=9)

Evaluation Question	Agree	Strongly Agree	Total Agree
The items in Section III are clear.	2	7	9
These items have a logical flow and sequencing.	2	7	9
These items make sense in the context of research on the preparation of school administrators for data use.	2	7	9
These items appear to be a good measure of the degree to which administrators perceive their graduate preparation adequately prepared them for data use.	2	7	9
These items appear to be useful for collecting information on the degree to which administrators perceive their graduate preparation adequately prepared them for data use.	1	8	9

In addition, the panelists for face validity were asked to indicate the approximate time that the ADUS took to complete. The longest completion time was 20 minutes. The shortest completion time was 7 minutes. The mean completion time was 13.22 minutes. This completion time corresponded to the time anticipated when the researcher developed the instrument. Furthermore, this corresponds with the suggestions as set forth in Rea

and Parker (1997). Table 10 illustrates this information. Based on the feedback of the face validation panel, the researcher concluded that the ADUS was face valid.

Table 10

Time of Completion of the ADUS (N=9)

Prompt	Minimum	Maximum	*M*	*SD*
The ADUS took approximately how many minutes to complete?	7	20	13.22	4.604

Reliability

The Administrator Data Use Survey was sent to a norming sample of 400 school administrators from New York State. Of the 400, 280 were building level administrators, with the great majority 276 or 98.6 % being principals. One had the title of Academic Testing Director while the other held a title of Director of a middle school. Of the remaining 120, 114 were district level administrators. This group was made up of 28 assistant superintendents, 14 directors of curriculum and instruction, 5 federal program directors, 1 regional superintendent, 31 special education directors, and 35 superintendents. The last six individuals were department level. Four were English Language Arts directors, while two were Math directors. The original mailing resulted in 91 instruments being returned. A follow-up postcard generated 20 more, for a total of 111. In addition, six responses arrived after the January 5th cut-off date. These were not included in the analysis.

Of the 111 instruments that were returned on or by January 5, 2006, one was completed by an individual who completed Section I and Section II of the instrument and

indicated at the bottom of Section III that he or she is not a practicing administrator. This response was deemed invalid and was not included in the analysis. The total number of valid responses was 110, or 27.5 % of those solicited. This response rate is above the minimum threshold of 20% according to Fowler (2002). A response rate below this threshold would be problematic.

The instrument contained three demographic questions. One item asked respondents to indicate their job title. One item asked respondents to indicate the number of years of experience in educational administration, including the present year. The last demographic item asked respondents to indicate the highest degree attained.

The item on job title was a closed-ended question offering respondents four choices. Respondents could identify themselves as department level (Coordinator), building level (Principal / Assistant Principal), district level (Assistant Superintendent / Deputy Superintendent / Director/Superintendent), and other. Among the valid responses, two identified themselves as department level. This corresponded to 1.8 % of the total valid responses. Seventy-four identified themselves as building level. This corresponded to 67.3 percent of the total valid responses. Thirty-four identified themselves as district level. This corresponded to 30.9 % of the total valid responses. Table 11 illustrates this analysis.

Table 11

Frequency Table on Job Title (N=110)

	Frequency	Percent
Department Level	2	1.8
Building Level	74	67.3
District Level	34	30.9
Total	110	100

The item on experience was an open-ended question. The experience level of respondents ranged from one to thirty five years. The mean experience was 13.46 years. The median experience was 12.00 years. The most frequently identified experience was 5 years, with nine respondents indicating this experience level. Table 12 illustrates this data.

Table 12

Respondents Experience Statistics (N=110)

Minimum	Maximum	*M*	Median	*SD*
1	35	13.46	12	8.436

The item on educational attainment was a closed-ended item that asked respondents to identify the highest degree they had attained. Respondents could indicate that they had attained a baccalaureate degree; master's degree; certificate of advanced study, second master's, or educational specialist degree; doctoral degree; or other. Among the valid responses, seven indicated that they had attained a master's degree.

This corresponded to 6.4 % of the total of valid responses. Eighty-three indicated that they had attained a CAS/second master's/educational specialist degree. This corresponded to 75.5 % of the total of valid responses. Twenty indicated that they had attained a doctorate. This corresponded to 18.2 % of the total of valid responses. Table 13 illustrates this data.

Table 13

Educational Attainment (N=110)

	Frequency	Percent
Master's degree	7	6.4
CAS, second master's, educational specialist degree	83	75.5
doctorate	20	18.2
Total	110	100.

To assess reliability of the retained items, a Spearman Brown split-half coefficient was calculated. The even numbered items were compared to the odd numbered items. The Spearman Brown split half coefficient for unequal length forms was calculated at .912. The correlation between forms was calculated at .838. The researcher had established relatively conservative reliability targets for reliability. According to Nunnally and Bernstein (1994), $\alpha > .70$ would be acceptable. The target range of $\alpha > .80$ was established for all reliability statistics. Table 14 and Table 15 show the inter-item correlation matrix for the 27 retained items.

Table 14

Inter-item Correlation Matrix ADUS – Items 1-13

Item	1	2	3	4	5	6	7	8	9	10	11	12	13
2	.865												
3	.710	.644											
4	.777	.739	.739										
5	.601	.585	.493	.591									
6	-.192	-.153	-.013	-.063	-.038								
7	-.114	-.071	.046	.086	.031	.798							
8	-.096	-.042	.083	-.028	.074	.726	.684						
9	-.154	-.075	-.088	-.060	-.107	.268	.344	.197					
10	-.084	-.181	-.094	-.100	-.002	.212	.252	.088	.631				
11	.001	-.012	.074	.093	.014	.210	.290	.074	.259	.254			
12	-.028	.000	-.003	.085	-.010	.179	.293	.081	.135	.023	.556		
13	.023	-.020	-.015	.021	.004	-.033	.080	-.110	.254	.165	.416	.405	
14	-.238	-.166	-.219	-.160	-.137	.195	.260	.150	.574	.525	.313	.280	.247
15	.523	.502	.559	.627	.721	.100	.190	.167	-.092	.003	.051	.105	.029
16	.698	.690	.638	.575	.537	.021	.034	.136	-.156	-.187	.077	.108	-.036
17	.825	.954	.597	.709	.534	-.108	-.063	-.032	-.079	-.214	.028	.035	.012
18	-.577	-.567	-.517	-.510	-.361	.011	-.020	-.052	.229	.205	.049	-.047	-.100
19	.671	.549	.633	.537	.478	-.006	.023	.118	-.185	-.123	.058	.071	-.027
20	-.245	-.241	-.112	-.164	-.098	.847	.679	.659	.509	.443	.155	.093	.006
21	-.083	-.020	.029	.044	.050	.797	.925	.620	.390	.321	.276	.283	.075
22	-.187	-.226	-.085	-.137	-.014	.780	.720	.492	.473	.466	.239	.205	.095
23	-.151	-.083	-.107	-.076	-.149	.114	.205	.027	.853	.579	.225	.187	.309
24	-.171	-.105	-.226	-.105	.038	.331	.348	.162	.579	.545	.253	.162	.228
25	-.034	-.053	.008	.114	-.088	.220	.296	.024	.279	.255	.587	.543	.412
26	.066	.037	.075	.186	-.060	.205	.255	.039	.230	.257	.481	.382	.241
27	.001	-.045	.035	.185	-.018	.032	.100	-.066	.299	.179	.453	.356	.539

Note. Item number corresponds to each item on the final version of the ADUS.

Table 15

Inter-item Correlation Matrix ADUS – Items 14-27

Item	14	15	16	17	18	19	20	21	22	23	24	25	26	27
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15	-.026													
16	-.299	.621												
17	-.169	.468	.669											
18	.211	-.340	-.577	-.532										
19	-.180	.578	.790	.495	-.608									
20	.390	.017	-.101	-.212	.122	-.099								
21	.287	.155	.048	-.042	.027	.003	.662							
22	.384	.059	-.086	-.224	.174	-.057	.790	.787						
23	.594	-.136	-.184	-.097	.232	-.159	.296	.271	.323					
24	.630	-.006	-.234	-.088	.192	-.190	.400	.386	.515	.592				
25	.423	.089	.024	-.042	.037	.012	.175	.313	.323	.316	.274			
26	.336	.106	.106	.064	.050	.137	.164	.271	.306	.219	.202	.789		
27	.239	.137	.050	.021	.041	-.054	.009	.100	.071	.301	.117	.471	.495	

Note. Item number corresponds to each item on the final version of the ADUS.

In addition to the split-half reliability statistics, the researcher examined the inter-item reliability for each identified construct separately, as well as for the entire battery of items. For the first construct, Assessment of Graduate Preparation, a Cronbach's alpha based on standardized items was computed at $\alpha = .873$ ($\mu = 26.28$, $SD = 8.35$) for the 10 items. For the second construct, Requisite Skills, a Cronbach's alpha based on standardized items was computed at $\alpha = .942$ ($\mu = 25.94$, $SD = 3.491$) for the 6 items. For the third construct, Importance of Data, a Cronbach's alpha based on standardized items was computed at $\alpha = .887$ ($\mu = 20.74$, $SD = 3.479$) for the five items. For the fourth construct, Data Tasks, a Cronbach's alpha based on standardized items was computed at $\alpha = .845$ ($\mu = 23.75$, $SD = 3.277$) for the six items.

Each of the four constructs had Cronbach's alpha> .80. In addition, the Cronbach's alpha for the entire instrument was above .80. The split-half reliability was calculated to be above .90. Again, all of these values were above the target of $\alpha > .80$ that had been established. Based on these data, the researcher concluded that the retained items formed an instrument with internal reliability.

Summary

This research study was intended to develop and validate an instrument to assess school administrators' perceptions on data use in education. Through a multi-level process of validation, the researcher concluded that this instrument was construct valid, content valid, criterion valid, and face valid. The results of the norming phase of the instrument further showed that the instrument had a strong reliability. In addition, factor analysis indicated that the items extracted into a number of distinct components. The

retained components and their items paralleled closely the researcher-theorized constructs. From this analysis, the researcher concluded that the final instrument (Appendix M) was both valid and reliable.

Chapter V Conclusions and Recommendations

Introduction

Data are being recognized as crucial to improving schools. Killian and Bellamy (2000) wrote that schools that fail to recognize this fact and fail to use data are ignoring a powerful tool. Holcomb (2004), Bernhardt (2004), and Zmuda et al. (2004) place data use at the center of school improvement. Danielson (2002) points to the importance of data as a crucial component of action research. She points to the need for the daily use of data and calls for a model of shared data responsibilities among school personnel. The work of Shannon and Bylsma (2003, 2004) illustrates the power of data as a common theme of improved schools. Bottoms & O'Neill (2001) point out that the competition and pressures from other nations have increased standards for schools. This pressure has placed a great responsibility on schools to become higher performing.

Though it is common knowledge that school administrators do not need advanced degrees in statistics to become effective users of this valuable tool (Berhnardt, 2004; Cizek, 2000; Creighton, 2001; Lachat, 2001) they do need a body of knowledge. They need to possess basic skills. They need to be able to analyze data from multiple sources, to interpret the data to determine trends, patterns and gaps, and to communicate the data to constituencies of varied sophistication, including other administrators, teachers, parents and community members, media, and students. Finally, they must be able to present this data in multiple formats, including written, spoken, and visual means to these constituencies.

Administrator preparation has been examined at length in research over the past four decades. A great deal of what is being written is critical of preparation of administrators (Levine, 2005). There has been an ongoing philosophical discussion over the past 20 years, concerning the need to develop a knowledge base for practicing administrators. The NCPEA, in July of 2005, established the NCPEA Connexions project, the aim of which is to facilitate discourse on the knowledge base in the field of educational administration.

Thompson (2001) attempted to codify a skills base for administrators into 21 domains. He highlights the need for administrators to be able to use data. Commenting on the degree to which school leaders are prepared for data use, Shannon and Bylsma (2004) indicate that they are not. Edirisooriya (1998) criticized administrator preparation programs for not preparing school leaders to meet the challenges of accountability. A general dearth of research in administrator preparation, as identified by Murphy and Vriesenga (2004), underscores the imperative for a needs assessment on the skills base of school administrators.

The development of the ADUS was the result of the aforementioned factors. The researcher concluded that an assessment of administrator perceptions of the importance of data was overdue. In addition, an analysis of administrator perceptions of the importance of data to their position would provide a valuable insight into the state of the profession. Finally, an examination of administrator perceptions of their preparation may validate or vilify the programs that are providing them with their training as well as the governing agents that are licensing or certifying them as competent. Torrence's (2002) line of inquiry, that there is a great deal that needs to be studied on administrators' use of

data and their perceptions of data and that their preparation for data use should be examined, parallels this researcher's framework. The ADUS was developed to address these three themes.

Summary of the Findings

This study was designed to create and validate an original instrument to assess school administrators' perceptions on three themes regarding data use. The final instrument, comprised of 27 items, was found to be reliable with Spearman Brown split-half reliability coefficients as well as Cronbach's $\alpha > .80$. In addition, it was found to have construct, content, criterion, and face validity.

Recommendations for Research

Based on the findings of this study, the researcher makes a number of recommendations for research.

1. This study should be replicated to confirm the validation conclusions.
2. This study should be replicated to confirm the reliability of the instrument
3. The ADUS should be subjected to face, content, and criterion validation by other validation panels to ascertain whether the conclusions of this study with these panelists hold with a different panel.
4. The ADUS should be administered to individuals who hold other positions in educational administration to ascertain the perceptions and skills needs of other positions, including department chairs, assistant principals, and assistant

superintendents as well as to compare the responses of these individuals to principals and superintendents.

5. As each state has its own certification/licensure, the ADUS should be administered to different geographic or regional populations that may have different certification requirements as well as different positional demands than the norming sample. This supports Torrence (2002) when she posits that the research that exists does not represent a national perspective. This would also be aligned with the work and recommendations of the NCPEA in working along with the National Association of Elementary School Principals (NAESP) and the National Association of Secondary School Principals (NASSP) to bring a greater practitioners' perspective to the discourse on the knowledge base in educational administration.
6. The ADUS should be utilized as a post job placement assessment tool by universities to evaluate the perceived efficacy of educational administration programs in terms of preparing school leaders for the data demands of their professions. Murphy (2005) points to work by Grace, nearly 60 years ago that highlights a gap in research. Institutions tasked with preparing school leaders were not adequately assessing the preparation of their students. The work of Murphy and Vriesenga (2004) indicate that they still are not. Without such an assessment, programmatic modifications cannot be made. Achilles (2005) recommends an evaluation of educational administration preparation, centering on three areas: 1) pre-program; 2) program, including the content; and 3) post-program. An understanding of the skills needed and an analysis of

those being currently taught from the perspective of the practitioner can only serve to strengthen the field in this area.

7. A larger, more comprehensive needs assessment of the profession should be undertaken. This would entail the creation of valid and reliable assessment instruments along the lines of the ADUS. An analysis of the preparation of administrators along all areas of positional responsibility as well as preparation would be invaluable to the profession. It would go a long way towards building an awareness of what the knowledge base in educational administration should be. Murphy (2005) indicates that there are entire areas of preparation that have yet to be explored. Even in those that have been explored, the findings are not based on empirical data. In addition, the changing nature of the profession over the past few decades has changed the preparation needs of practitioners. Murphy (2005) indicates that there is a need to investigate and research this new preparation landscape. Through such an assessment, the profession may better meet the needs of practitioners today, as well as for the future.
8. An analysis of the findings of the ADUS in the context of the theory of planned behavior should be conducted. The ADUS was developed to examine administrators' perceptions of the importance of data, the importance of data to positions in educational administration, and the degree to which administrator feel that their graduate preparation in educational administration prepared them for the data demands of their position. While connections have been identified through research in other areas, there has been no proven

connection between administrators' perceptions and their practice in regards to data analysis. Through the an inquiry along the lines of theory of planned behavior, a connection to the factors that promote administrators' intention to use data, their actual use of data, and the fruits that may be bore of changes brought about by this data use may be established.

Recommendations for Policy

In addition to the aforementioned research implications for the ADUS, an administration of the instrument may highlight significant policy implications.

1. The ADUS, in its present form, should be administered to practicing administrators in New York State to ascertain their perceptions of the graduate preparation for the data use requirements of their position as well as their perception of the skills needed for the current educational milieu. Based on the findings from this administration, recommendations to the New York State Board of Regents as to changes in certification may be formulated as well as supported.
2. If the data indicate that there is a gap between the certification requirements of administrators and the needs of practitioners, then it would be incumbent for policy makers, namely the New York State Board of Regents, to change certification requirements so as to ensure the adequate preparation of school leaders for the current educational climate as well as to prepare them to meet the challenges of the future. As Hess (2003) indicates, the benchmarks that evidence a concrete and adequate body of knowledge do not exist in the

current environment of educational leadership. Data analytical skills must be taught to practicing administrators in the context of their educational administration preparation programs.

3. At the micro-level, the ADUS has value for identifying the beliefs of administrators regarding the importance of data as well as the level of data analytical competency that they profess to possess. Accordingly, districts should consider utilizing the ADUS as part of an administrative applicant screening process.

Conclusion

The connection between data use and school improvement has been shown repeatedly over the past 20 years. Assessments are intended as diagnostic tools. They provide evidence that shows individual student as well as curricular deficiencies. Attention to these deficiencies and program or instructional modification to meet the needs of students can guide educators towards improving instruction and can lead to student mastery of subject matter.

Though data by itself cannot accomplish anything in the way of improving America's schools, and the educational system in general, there is strong evidence that data use is a key to improving schools. Educational leaders must possess the requisite skills and competencies to meet the challenges of an increasingly complex, yet evermore competitive world. Those who are tasked with leading the nation's schools must be able to analyze and interpret data from a variety of sources for a multitude of purposes. They must be able to communicate this data effectively to teachers, fellow administrators,

community members and families, media, and, of course, students. They must be able to present this data in formats that each constituent group can consume. Lacking the these skills, educational leaders will be unable to tap into a powerful tool that has such promise for educational improvement.

The success of our schools determines the strength of our entire democracy and our economy. The U.S. cannot outsource its education. We must improve it to create participative and productive citizens. The entire educational system must answer the call to become data driven as a means of improving student achievement and performance and the quality of instruction in our schools. School leaders must possess the skills to use data in order to foster achievement at the student, school, district, state, and national level. Effective educational leadership in the current environment depends on it.

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Appendix A

Construct Validity Assessment Part I

Final Version

Dear Construct Validity Juror,				

Thank you for agreeing to assist me with this research. Enclosed you will find the first of two means of construct validity assessment for this instrument.

The items in attached represent a bank of questions developed to assess practicing school administrators' perceptions along three areas: 1) the importance of data use to improving student achievement; 2) the importance of data to current position; 3) the degree to which graduate preparation in educational administration prepared them for the data use demands of their position.

These items are ordered alphabetically based on the first word of the question. Please place a check mark (√) in the appropriate construct box for each item under the construct heading where you feel it is most appropriate. If an item is appropriate to more than one construct, check each appropriate box.

When the construct validity for these items has been ascertained, individual items will be retained and others discarded. A draft of the instrument containing these retained items, organized by construct, will be sent to you to for content validity assessment. Specific directions for that validity testing will accompany the draft of the instrument. Criterion validity and face validity will be assessed by two separate juries.

The validated instrument will be sent to ~400 practicing administrators throughout New York State for reliability testing. The responses will be organized around a five point Likert Scale with ascending affirmative responses as below:

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1	2	3	4	5

For the purpose of this instrument, the term data use implies analysis, interpretation, and communication.

Please return all materials to me in the preaddressed stamped envelope as soon as possible but preferably by Wednesday, October 5, 2005 so that I may proceed to the next phase of validity testing.

Thank you, again, for your assistance with this research.

1.	Additional graduate preparation for data use would have benefi
2.	As a result of changes in education brought about by the standa legislation, the importance of data use to my current position ha
3.	As a result of my graduate preparation in educational administra explain the impact of multiple variables on student achievement
4.	As a result of my graduate preparation, I was well prepared for position.
5.	As a result of my graduate program in educational administratio analyze data.
6.	As a result of my graduate program in educational administratio present interpretations of data to community members or media
7.	As part of my graduate administration preparation program, I to and/or data analysis.
8.	As part of my professional responsibilities, I work with teachers prescriptive plans for improvement.
9.	As part of my professional responsibility, I meet with media and assessment results.
10.	As part of my professional responsibility, I meet with other adm results.
11.	Data analysis is important to my current position.

12. Data interpretation is important to my current position.
13. Data use has become more important for addressing student ach
14. Data use is a daily component of my current position.
15. Data use is important to closing achievement gaps.
16. Data use is important to helping all students achieve.
17. Data use is increasing in importance to my current position
18. Following my graduate preparation in Educational Administrati or seminars in data analysis in order to be prepared for the data
19. Graduate preparation programs adequately prepare school admi of the current educational environment.
20. Graduate programs in educational administration should prepare promote student achievement.
21. High performing schools/districts effectively use data to improv
22. I feel that my graduate preparation in educational administration analysis to multiple constituencies at their own level of compete
23. I feel that others who work in my position frequently use data in
24. I have made recommendations to teachers about programmatic c
25. I learned more about data use for my position from colleagues than in educational administration.

	Importance to Current
26. In my current position, I have made recommendations to the sc	
27. In my school district, data use is solely the responsibility of otl	
28. In my school district, data use is viewed as crucial to improvin	
29. In order to meet the data use (analysis, interpretation, and com position, I had to learn on the job.	
30. My administrator preparation on the graduate level prepared m	
31. My current position requires me to analyze data frequently.	
32. My current position requires me to analyze data from a variety	
33. My current position requires me to communicate with media a assessment results.	
. My current position requires me to communicate with other ad	
. My current position requires me to communicate with teachers	
. My current position requires me to interpret data frequently	
. My current position requires me to interpret data from a variety	
. My current position requires me to present statistical analysis c	
My current position requires me to present statistical analysis c	
. My current position requires me to present to media and comm	
. My district has increased its data use for the purpose of improv the standards movement and the NCLB legislation.	
42. My graduate education in educational administration prepared	

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35
36
37
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39.
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41

	Importance to Current
	and communication challenges in education brought about by t legislation.
43.	My graduate preparation in educational administration prepare responsibilities of my current position.
44.	My graduate preparation in educational administration prepare of sources.
45.	My graduate preparation program in educational administratio statistics and/or data analysis.
46.	My school district emphasizes data use.
47.	My school/district utilizes data for planning and preparation.
48.	My school/district utilizes data for problem solving.
49.	My school/district utilizes data to improve student achievement
50.	One of the most important tools for improving student achiever
51.	The graduate preparation I received prepared me well to meet t on by the standards movement and the NCLB legislation.

Appendix B

Construct Validity Assessment

Part II

Dear Construct Validity Juror,

Again, I thank you for agreeing to assist me with this research. Enclosed you will find the second of two means of construct validity assessment for this instrument.

This assessment asks you to examine a draft of the items organized by construct. On the Construct Comments form, please comment on the degree to which these items reflect the intended construct.

When the construct validity for these items has been ascertained, individual items will be retained and others discarded. A draft of the instrument containing these retained items, organized by construct, will be sent to you to for content validity assessment. Specific directions for that validity testing will accompany the draft of the instrument. Criterion validity and face validity will be assessed by two separate juries.

The validated instrument will be sent to ~400 practicing administrators throughout New York State for reliability testing. The responses will be organized around a five point Likert Scale with ascending affirmative responses as below:

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1	2	3	4	5

For the purpose of this instrument, the term data use implies analysis, interpretation, and communication.

Please return all materials to me in the preaddressed stamped envelope as soon as possible but preferably by Wednesday, October 19, 2005 so that I may proceed to the next phase of validity testing.

Thank you, again, for your assistance with this research.

Construct	
Importance to Improving Student Achievement	**Importance to C**

Appendix C

Content Validity Assessment

Content Validity Assessment

Please use the attached form to comment on the degree to which, based on your expertise, you believe that the original instrument, the Administrator Data Use Survey, measures the perceptions of practicing school administrators along the three themes identified.

For ease of completion, a space for comment on each of the three themes has been provided. Feel free to use the back of this form or additional pages as needed. Please return only your Content Validity Assessment Form to me in the preaddressed stamped envelope.

I thank you, in advance, for your assistance with this research.

Content Validity Assessment Form

To what extent do these items, and does this instrument in general, measure administrator perceptions of the following theme/concept?

The importance of data use to improving student achievement:

The importance of data use to administrators' current position:

The degree to which graduate preparation in educational administration adequately prepared practicing school administrators for the data use responsibilities of their position:

Appendix D

Second Content Validity Assessment Form

November 7, 2005

Dear Content Validity Jury Members,

Once again, I thank your for your assistance with this research. The attached represents the revised Administrator Data Use Survey. Your comments and suggestions guided the revision, and I appreciate your assistance to this point.

There was consensus that Section II was reasonably content valid. There was concern by panel members that Section I and Section III required additional items in order to have that same content validity. Accordingly, there were additions to these sections in order to better cover the range of topics in the field of data use.

Several individuals indicated that particular questions were more apropos to certain positions than others. For your information as you examine this draft, this instrument will be sent, following criterion and face validation, to a norming sample of school administrators in New York State. This sample will be randomly drawn from a list maintained by the New York State Education Department. While there are a number of directors and assistant superintendents on this list, the majority of individuals on the list are principals (elementary, middle and high school) or superintendents.

Once again, I ask that you examine this revision and provide me with information on this instrument so that I may assess the content validity of the instrument. I have attached a Content Validity Assessment Form to facilitate this process.

When the content validity for this instrument has been ascertained, the revised instrument will be sent to two separate juries. A jury of practicing superintendents from regions throughout the United States will analyze the instrument to assess its criterion validity. A jury of practicing school administrators from regions throughout the US will analyze the instrument for face validity.

Once the validity assessment has been completed, the validated instrument will be sent to ~400 practicing administrators for reliability testing.

Please return only the Content Validity Assessment Form to me in the preaddressed stamped envelope as soon as possible, but preferably by Wednesday, November 16, 2005 so that I may proceed to the next phase of validity testing.

Thank you, again, for your assistance with this research.

Frank Sheboy

Content Validity Assessment Form

To what extent do these items, and does this instrument in general, measure administrator perceptions of the following theme/concept?

The importance of data use to improving student achievement:

The importance of data use to administrators' current position:

The degree to which graduate preparation in educational administration adequately prepared practicing school administrators for the data use responsibilities of their position:

Appendix E

Criterion Validity Assessment

Dear Criterion Validity Jury Member,

Thank you for your willingness to assist me in the criterion validity assessment of this original instrument, the Administrator Data Use Survey. This instrument has gone through a number of revisions prior to it being sent to you. It has had construct validity assessed by a jury of experts in the field of administrator preparation, the subject of data use in school, and administrator preparation for data use. Several individuals whose positions are tied integrally to data analysis were also asked to participate in this jury. Following an informed revision, the same jury was asked to assess the content validity of the entire instrument. The instrument attached is the culmination of revisions based on that additional feedback.

The next phase of this research is to assess the criterion validity of the instrument. I ask that you examine the instrument and provide me with information to ascertain the degree to which the instrument measures variables that other instruments measure. As there is no existing instrument that measures the three themes that this instrument was designed to measure, criterion validity must be assessed via alternate means.

As practicing superintendent of schools, you are tasked with hiring and evaluating school administrators, building and district level. I ask that you examine the instrument attached. Based on your position I ask that you complete the Criterion Validity Assessment Form. The form has three questions. If you have any additional comments, please write place them on the reverse side of the form.

When the criterion validity for this instrument has been ascertained, the revised instrument will be sent to one final jury. This jury of practicing school administrators from regions throughout the US will analyze the instrument for face validity.

Once the validity assessment has been completed, the validated instrument will be sent to ~400 practicing administrators from New York State for reliability testing.

Please return only the Criterion Validity Assessment Form to me in the preaddressed stamped envelope as soon as possible, but preferably by Tuesday, November 30, 2005 so that I may proceed to the final phase of validity testing.

Thank you, again, for your assistance with this research.

Frank Sheboy

Criterion Validity Assessment Form

1. To what extent do the items in this instrument reflect the criteria against which you evaluate your staff as well as the areas of data analysis that are important to the field?

2. To what extent do the items in this instrument match the professional requirements of your staff in terms of data use?

3. To what extent do the items in this instrument reflect the standards of professional competency in terms of data use in the field of educational administration?

Appendix F

Face Validity Assessment

Please use the form below to comment on the face validity of the attached original instrument, the Administrator Data Use Survey. Kindly return only this form in the pre-addressed stamped envelope ASAP.

Section I – Importance of Data

1. The items in this section are clear.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
2. The items in this section have a logical flow and sequencing.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
3. The items in this section make sense in the context of research on the importance of data use in education.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
4. The items in this section appear to be a good measure of administrator perceptions of the importance of data to improving student performance.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
5. The items in this section appear to be useful for collecting information on administrator perception of the importance of data to improving student performance.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree

Section II – Importance of Data to Current Position

1. The items in this section are clear.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
2. The items in this section have a logical flow and sequencing.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
3. The items in this section make sense in the context of research on the importance of data use to positions in school administration.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
4. The items in this section appear to be a good measure of administrator perceptions of the importance of data to their current position.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
5. the items in this section appear to be useful for collecting information on administrator perception of the importance of data to their current position
   _____strongly disagree _____ disagree _____ agree _____ strongly agree

Section III – Preparation for Data Use

1. The items in this section are clear.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
2. The items in this section have a logical flow and sequencing.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
3. The items in this section make sense in the context ofresearch on the preparation of school administrators for data use.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
4. The items in this section appear to be a good measure of the degree to which administrators perceive their graduate preparation adequately prepared them for data use.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree
5. The items in this section appear to be useful for collecting information on the degree to which administrators perceive their graduate preparation adequately prepared them for data use.
   _____strongly disagree _____ disagree _____ agree _____ strongly agree

The Administrator Data Use Survey took approximately minutes to complete.

Appendix G

Construct Validity Jury

Assessment Results – Part I

	Importance to Improving Student Achievement	Importance to Current Position	Graduate Preparation
1. Additional graduate preparation for data use would have benefited me professionally.	1	1	[4]
2. As a result of changes in education brought about by the standards movement and the NCLB legislation, the importance of data use to my current position has increased.		[4]	
3. As a result of my graduate preparation in educational administration, I feel confident in my ability to explain the impact of multiple variables on student achievement as measured by standardized tests.	2	1	[3]
4. As a result of my graduate preparation, I was well prepared for my current educational administrative position.		2	[3]
5. As a result of my graduate program in educational administration, I feel confident in my abilities to analyze data.		1	[4]
6. As a result of my graduate program in educational administration, I feel confident in my abilities to present interpretations of data to community members or media.		1	[3]
7. As part of my graduate administration preparation program, I took one or more courses in statistics and/or data analysis.		1	[4]
8. As part of my professional responsibilities, I work with teachers to analyze assessment data to develop prescriptive plans for improvement.	1	[4]	
9. As part of my professional responsibility, I meet with media and community members to discuss assessment results.	1	[4]	
10. As part of my professional responsibility, I meet with other administrators to discuss assessment results.	1	[4]	
11. Data analysis is important to my current position.		[4]	
12. Data interpretation is important to my current position.		[4]	
13. Data use has become more important for addressing student achievement over the past decade.	[4]	1	
14. Data use is a daily component of my current position.		[4]	

	Importance to Improving Student Achievement	Importance to Current Position	Graduate Preparation
15. Data use is important to closing achievement gaps.	[4]	1	
16. Data use is important to helping all students achieve.	[4]		
17. Data use is increasing in importance to my current position		[4]	
18. Following my graduate preparation in Educational Administration, I had to take additional coursework or seminars in data analysis in order to be prepared for the data use responsibilities of my position.		3	[4]
19. Graduate preparation programs adequately prepare school administrators for the data use requirements of the current educational environment.			[4]
20. Graduate programs in educational administration should prepare administrator candidates to use data to promote student achievement.	2	1	[4]
21. High performing schools/districts effectively use data to improve student achievement.	[3]	1	1
22. I feel that my graduate preparation in educational administration prepared me to communicate data analysis to multiple constituencies at their own level of competence.		1	[4]
23. I feel that others who work in my position frequently use data in their position.		1	1
24. I have made recommendations to teachers about programmatic change based on data use.	2	[3]	
25. I learned more about data use for my position from colleagues than from my graduate program in educational administration.	1	1	[3]
26. In my current position, I have made recommendations to the school board based on data use.	1	[4]	
27. In my school district, data use is solely the responsibility of other individuals.		[3]	1
28. In my school district, data use is viewed as crucial to improving student achievement.	[4]	1	
29. In order to meet the data use (analysis, interpretation, and communication) requirements of my current position, I had to		1	[3]

	Importance to Improving Student Achievement	Importance to Current Position	Graduate Preparation
learn on the job.			
30. My administrator preparation on the graduate level prepared me well for my current position.			[4]
31. My current position requires me to analyze data frequently.		[4]	
32. My current position requires me to analyze data from a variety of sources.		[4]	
33. My current position requires me to communicate with media and community members about assessment results.	1	[4]	
34. My current position requires me to communicate with other administrators about assessment results.		[4]	
35. My current position requires me to communicate with teachers about assessment results.	2	[4]	
36. My current position requires me to interpret data frequently		[4]	
37. My current position requires me to interpret data from a variety of sources.		[4]	
38. My current position requires me to present statistical analysis or data analysis to other administrators.		[4]	
39. My current position requires me to present statistical analysis or data analysis to teachers.	1	[4]	
40. My current position requires me to present to media and community members about assessment results.	1	[4]	
41. My district has increased its data use for the purpose of improving student achievement as a result of the standards movement and the NCLB legislation.	[4]	1	
42. My graduate education in educational administration prepared me for the data analysis, interpretation, and communication challenges in education brought about by the standards movement and the NCLB legislation.	1	1	[4]
43. My graduate preparation in educational administration prepared me well for the data use responsibilities of my current position.	1	2	[4]
44. My graduate preparation in educational administration prepared me for analysis of data from a variety of sources.	1	1	[4]

	o Importance to Improving Student Achievement	o Importance to Current Position	Graduate Preparation
45. My graduate preparation program in educational administration required that I take coursework in statistics and/or data analysis.	1	1	**[4]**
46. My school district emphasizes data use.	**[3]**	2	
47. My school/district utilizes data for planning and preparation.	**[3]**	2	
48. My school/district utilizes data for problem solving.	**[4]**	2	
49. My school/district utilizes data to improve student achievement.	**[4]**	1	
50. One of the most important tools for improving student achievement is data use.	**[4]**	1	
51. The graduate preparation I received prepared me well to meet the challenges of accountability brought on by the standards movement and the NCLB legislation.	1	1	**[4]**

Appendix H

Construct Validity Jury

Assessment Results – Part II

Construct I – Importance to Improving Student Achievement

- There are repetitive items present here. These items were also repetitive on the item mapping sheet.

There is a practical problem with "translating" data analytical results for student improvement. This is an institutional (school/district) cultural issue. Pertinent to this study, it may be useful to get the perceptions of "administrators" on the level of school's district's use of data analytical results (the degree to which) for instructional practice.
The wording of question 11 is awkward.
Data use cannot improve student achievement.
The items paid attention to the process involved that school data is valid and that the information reflects reality.

Construct II – Importance to Current Position

There are repetitive items present here. These items were also repetitive on the item mapping sheet.
Consider an item on such as "From the current position their perception of degree of barriers to implement data analytical results for student academic improvement".
Many people do funny things to keep a job.
The items center around my belief that good data are an integral part of teaching and learning.

Construct III – Graduate Preparation

There are repetitive items present here. These items were also repetitive on the item mapping sheet.
Consider an item such as "Has/did "the graduate program" prepare individuals on how to translate data analytical results into instructional practice".
Graduate preparation should introduce an educational administrator to data (types, etc.) and value/limitations of data an how to understand the data.

Appendix I

Rotated Component Matrix

	Component														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
I believe that my graduate preparation in educational administration prepared me for analysis of data from a variety of sources	.835				.346										
As part of my graduate preparation in educational administration, I learned to use a statistics software program to analyze data	.822														
I believe that my graduate preparation in educational administration prepared me to effectively use data for program evaluation	.821				.300										
As part of my graduate preparation in educational administration, I learned to interpret data reports from a variety of sources	.819														
I believe that my graduate education in educational administration prepared me for the data analysis, interpretation, and communication challenges in education brought about by the standards movement and/or the NCLB legislation	.765								.319						

I believe that my graduate preparation in educational administration prepared me to effectively use data for planning	.756				.352													
I believe that my graduate preparation in educational administration prepared me to communicate data analysis to multiple constituencies	.730								.392									
I believe that in order to meet the data use (analysis, interpretation, and communication) requirements of my current position, I had to learn on the job	.697										.401							
I believe that my graduate preparation in educational administration required that I take coursework in statistics and/or data analysis	.614																	
As part of my graduate preparation in educational administration, I took one or more courses in statistics and/or data analysis	.594				.337													
The following skills should be taught in administrator preparation programs - communication of data analysis		.933																
The following skills should be taught in administrator preparation programs - presentation of data analysis in multiple formats (e.g. written reports, graphs)		.832	.334															

The following skills should be taught in administrator preparation programs - data analysis	.827		
The following skills should be taught in administrator preparation programs - data use for program evaluation	.821		
The following skills should be taught in administrator preparation programs- statistical analysis	.791		
The following skills should be taught in administrator preparation programs - data use for program planning	.790	.301	
I believe that data use is important to closing achievement gaps		.816	
I believe that data use is important to helping all students achieve		.809	
I believe that data use has become more important for addressing student achievement over the past decade		.683	
In my current position, I have made recommendations to teachers about programmatic changes based on data use		.647	.412
I believe that Schools/Districts which effectively use data to improve student achievement are better able to become high performing schools/districts		.614	

																			135		
I believe that one of the most important tools for improving student achievement is data use				.576						.350											
Additional graduate preparation for data use would have benefited me personally	.357			.572																	
I wish I had more opportunities to learn advanced data analysis techniques in my graduate educational administration preparation program	.463	.314		.505																	
I believe that I learned more about data use for my position from colleagues than from my graduate program in educational administration	.461			.490																	
Following my graduate preparation in Educational Administration, I had to take additional coursework or seminars in data analysis in order to be prepared for the data use responsibilities of my position				.408		.378												.326			
In my current position, I interpret data from a variety of sources					.826																
In my current position, I present the results of statistical or data analysis to other administrators					.756																
In my current position, I analyze data from a variety of sources					.704																
In my current position, I interpret data frequently					.672															.512	

													136
In my current position, I work with teachers to analyze assessment data to develop prescriptive plans for improvement				.646									
In my current position, I present the results of statistical or data analysis to teachers				.627						.342			
Data analysis is important to my current position			.301	.482									.309
In my current position, I have daily conversations with my colleagues regarding the results of data analysis	.321			.438				.373			.301		
As a result of my graduate preparation in educational administration, I feel confident in my abilities to train other administrators or teachers in data use	.310				.825								
As a result of my graduate preparation in educational administration, I feel confident in my abilities to analyze data	.374				.820								
As a result of my graduate preparation in educational administration, I feel confident in my ability to explain the impact of multiple variables on student achievement which are measured by standardized tests.	.383				.797								

														137	
As a result of my graduate preparation in educational administration, I feel confident in my abilities to present interpretations of data to community members or media	.366				.780										
As a result of my graduate preparation in educational administration, I was well prepared for my current educational administrative position	.423				.739										
My school district has increased its data use for the purpose of improving student achievement as a result of the standards movement and/or the NCLB legislation					.766										
In my district, data use is viewed as crucial to improving student performance					.765										
My school district engages administrators and teachers in results meetings to examine assessment data to identify programmatic strengths, weaknesses,and areas of development					.622										.375
My school district emphasizes data use					.609						.405			.363	
My school/district utilizes data for problem identification/solving					.538	.488									
My school/district utilizes data for planning and preparation			.389		.474	.443									

My school/district utilizes data to improve student achievement			.418			.465	.435											
My school/district utilizes data to track improvement in individual students							.823											
My school/district utilizes data to identify individual students' weaknesses							.814											
I believe that graduate preparation programs in educational administration should prepare administrator candidates to use data to promote student achievement		.360						.703										
I believe that data analysis can be effectively used to meet programmatic requirements of the state and/or federal government			.300					.678										
In my current position, I communicate with other administrators about assessment results								.644										
I believe that data analysis can be used to identify programmatic weaknesses			.401					.561										
Data use is increasing in importance to my current position		.337						.430										
I believe that graduate preparation programs adequately prepare school administrators for the data use requirements of the current educational environment	.349								.733									

I believe that graduate preparation programs in educational administration prepare administrators well for the data use requirements of their position	.479			.306			.681					
My school district analyzes data primarily from standardized tests								.769				
I believe that one major purpose of data analysis is to identify individual student needs so as to be able to meet them					.354			.642				
In my current position, I communicate with media and community members about assessment results									.715			
The following skills should be taught in administrator preparation programs - use of data warehouse software		.446								.707		
The following skills should be taught in administrator preparation programs - use of statistical analysis software		.511								.684		
In my current position, I use data analysis tools, including statistical or data analysis software			.402								.628	
My school district has adopted a formal data warehouse program		.398				.384					.500	
In my current position, I have made recommendations to the school board based on data.			.311						.363		.378	

As a result of changes in education brought about by the standards movement and/or the NCLB legislation, the importance of data use to my current position has increased.	.459	.513

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 16 iterations.

Appendix J

Content Validity Jury Responses

Assessment One

General Comments:

- Expressed some confusion as to whether I was assessing content or construct validity through this examination.
- This looks good. Consider the comments on the next page."
- "In general, your survey looks good and should provide some interesting responses.

Theme I - The importance of data use to improving student achievement:

- The language is weak. The items do not cover the range of meaning in the concepts of data use and student achievement well."
- Include an item or two on "in what ways data cab be used to improve student achievement." "One major purpose of data analysis is for diagnostic purposes"
- "Data analysis can be effectively used for programmatic (state, federal) requirements.
- Five items "are those that assess the respondents' beliefs about the importance of data use. All other items appear to be more factual, i.e. my district uses ..."
- Include an item such as "my district has adopted a formal data warehouse program."

Quality data allows administrators to make sound educational decisions about their students.

Student performance gains will result from decisions based on quality data.

Administrator will be able to improve students' educational experience because the instructional program will be based on accurate data.

This section incorporates two aspects: attitudes of data use and factual reporting. Suggest separating these aspects. Also, 'data use' is a very general term. Instrument does not ask about frequency of data use or types of data use. thus this instrument cannot distinguish between administrators who use standardized test data once a year and those who use data more frequently.

Theme II – The importance of data use to administrators' current position.

"this set of items seems reasonably content valid, given the restricted concept of an administrator's position."

This panelist commented on the fact that different administrators would respond to these items differently.

"Looks OK"

One item does not seem tied to respondent's current position due to being worded differently.

The item is worded "I have made recommendations to teachers..." rather than "In my current position, I have made recommendations...".

One question would be likely be answered a particular way by superintendents and another way, necessarily, by other administrators.

Every administrator has diverse responsibilities within their schools; among these is the responsibility to ensure that what is happening at your school is accurately reflected in the data.

Most of the questions look fine. However, there is no question that elicits the type of analysis that administrators perform and so cannot distinguish between those who present descriptive statistics once a year compared with more

sophisticated analysis, including longitudinal analysis. This is important in terms of preparation. Our research has shown that administrators lack the more sophisticated skills.

Suggest including a question about use of a data analysis tool. This will shed light on the importance of data.

Theme III – The degree to which graduate preparation in Ed. Admin. Adequately prepared practicing school administrators for the data use responsibilities of their position.

"because there are levels of preparation, these items are too general for the domain and for the wider range of potential uses of data."

Commenting on one item that asks for information on graduate preparation in general, this panelist recommends an additional item on "administrator's own" preparation.

Panelist also recommends an additional item on preparation.

"There is a difference between statistics and data analysis, you may wish to clarify this."

Commenting on one item, "I'm not certain they could speak about other programs without specific knowledge about them".

In regards to this item, the literature states that administrators tend to rate their own preparation very high, but rate other programs low. This is the reason Panelist II recommended an additional item, to separate those themes.

Graduate preparation in educational administration prepared me for the responsibility to enhance the educational program of students, to improve student achievement, and to see that district policies are implemented.

Looks good. I might also add a question about the level of confidence to train other administrators and teachers in data use.

Appendix K

Content Validity Jury

Assessment Two

General Comments:

- Try to connect these items with evidence from your literature review.

Theme I - The importance of data use to improving student achievement:

- The revised items show that process involves working collaboratively with staff and school community to identify discrepancies between current and desired outcomes.
- Clarify questions to include the standards movement and/or NCLB legislation.
- Add items that reflect identifying individual students' weaknesses' and to track improvement in individual students.
- This looks ok
- This looks good.

Theme II – The importance of data use to administrators' current position.

- The revised items show that administrators must lead their school through the goal setting process in which student achievement data is analyzed, improvement areas are identified, and actions for change initiated.
- No comments–looks good.
- This looks ok
- This looks good.

Theme III – The degree to which graduate preparation in Ed. Admin. Adequately prepared practicing school administrators for the data use responsibilities of their position.

- The revised items identify performance measures and indicators that link key instructional processes to instructional goals; align school improvement goals, classroom instruction, and classroom/school assessment.
- Several questions are repetitive.
- This looks ok.
- Some repetitions. Repetitive items are to be deleted.
- Other than repeated items, this looks good.

Appendix L

Criterion Validity Jury

Assessment Results

To what extent do the items in this instrument reflect the criteria against which you evaluate your staff as well as the areas of data analysis that are important to the field?

- Very much so in the areas of using data
- Effective data analysis and subsequent planning has been the focal point of much of the district's professional development for administrators and staff during this past academic year. The Tie-Net Student Information System was introduced to administrators and teachers as a process to examine student and staff performance more thoroughly. Specific workshops have been geared to establishing district wide protocols for the interpretation and use of student data.
  Section 1 clearly represents the necessity of effective data analysis for program planning and to enact any curricular or personnel changes.
- The items in the instrument strongly reflect the criteria against which I evaluate my staff as well as the areas of data analysis that are important in the field. Because I believe that high student achievement is strongly linked to student assessment tools, it is vital that teachers and administrators are familiar with and develop a strong understanding of the components of state and standardized tests. In this way, future in-class assessments are formatted in a way that will enable students to develop a comfort level with the format of state and standardized assessment.
- The instrument is actually much more comprehensive and detailed than I use. I found it to be beneficial and an excellent parallel of critical areas of performance.
- With the movement for even grater accountability, I believe that data analysis is critical. All school personnel must be able to evaluate student achievement data and identify areas on concerns and strengths. It is very important to use data to track student and school improvement. As an administrator, I look at data – especially from out state assessment system to identify areas of concern as well as strengths in my staff. This data helps formulate our school goals and gives us measurable benchmarks that we must reach.

To what extent do the items in this instrument match the professional requirements of your staff in terms of data use?

- We have high expectations in this area. Our administrators have had significant training.
- The items in the instrument match our district's emphasis on the use of data. More conversations are encouraged and taking place at both the district and school level. This dialogue will lead to implementing the necessary strategies to meet the specific needs of our students. More meetings are providing staff members with more time to examine data and discuss future educational initiatives.
- The items in this instrument strongly match the professional requirements of my staff in terms of data use. In order for my staff to design lessons and write curriculum based on student needs, they need to be able to analyze data and understand its meaning.

- It matches the components we use quite nicely. As aforementioned, it is most comprehensive.
- As mentioned above, all staff must be able to look at data and analyze it to help improve daily instruction, which in turn helps individual students. My district is currently preparing for our state's school improvement visit. The majority of our preparation has been looking at data and setting goals based off the data. The school improvement process as well as the state assessment process has forced us to have daily conversations about data analysis. I feel that these conversations regarding data have made us all better educators. As superintendent, my board is very interested in seeing data and they have become very educated in regards to what the numbers indicate. Data analysis plays an important in the way they evaluate my performance.

To what extent do the items in this instrument reflect the standards of professional competency in terms of data use in the field of educational administration?

- This is a very good instrument.
- Most educators would concur that the educational leadership programs do not place enough of an emphasis on analyzing data and its relationship to visionary leadership. It is up to individual district personnel to reinforce the importance of interpreting student data to assess their achievement. Effective data analysis also provides a substantial evaluative tool for administrators to assess instructional staff members. Too often, administrators will receive binders of student test results with no direction on how to use this data. Frequent use of new student information systems places the data in a user friendly format to facilitate discussion. After the data is analyzed and patterns are detected, it is equally critical to initiate dialog about addressing any noted deficiencies.
- The items in the instrument strongly reflect the standards of professional competency in terms of data use in the field of educational administration.
- Data has become increasingly important. Although few may be at the level this survey measures, there is little doubt it is quickly becoming the standard.
- I feel like I have a lot to learn about data and data analysis through actual application. All educational preparation programs should include some requirement of statistics/data analysis. The importance of an individual's knowledge in regards to data analysis will play a major role in his/her success as an educator. It is paramount that educators based their decisions off of sound data. That is the only way we will see continued improvement in education.

AppendixM

Administrator Data Use Survey

Final Version

assessment data to develop prescriptive plans for improvement.					
8. In my current position, I present the results of statistical analysis or data analysis to teachers.	☐	☐	☐	☐	☐
10. In my current position, I interpret data from a variety of sources.	☐	☐	☐	☐	☐
12. I believe that my graduate preparation in educational administration prepared me for analysis of data from a variety of sources.	☐	☐	☐	☐	☐
14. I believe that my graduate preparation in educational administration prepared me to effectively use data for program evaluation.	☐	☐	☐	☐	☐
1. I believe that schools/districts which effectively use data to improve student achievement are better able to become high performing schools/districts.	☐	☐	☐	☐	☐
3. I believe that data use is important to helping all students achieve.	☐	☐	☐	☐	☐
4. I believe that data use is important to closing achievement gaps.	☐	☐	☐	☐	☐
5. I believe that data use has become more important for addressing student achievement over the past decade.	☐	☐	☐	☐	☐
7. In my current position, I present the results of statistical analysis or data analysis to other administrators.	☐	☐	☐	☐	☐
9. In my current position, I interpret data frequently	☐	☐	☐	☐	☐
11. In my current position, I analyze data from a variety of sources.	☐	☐	☐	☐	☐
13. As part of my graduate preparation in educational administration, I learned to use a statistics software program to analyze data.	☐	☐	☐	☐	☐
15. As part of my graduate preparation in educational administration, I learned to interpret data reports from a variety of sources.	☐	☐	☐	☐	☐

24. The following skill should be taught in administrator preparation programs - data use for program evaluation	☐	☐	☐	☐	☐
26. The following skill should be taught in administrator preparation programs - presentation of data analysis in multiple formats (e.g. written reports, graphs)	☐	☐	☐	☐	☐
17. I believe that my graduate preparation in educational administration prepared me to effectively use data for planning	☐	☐	☐	☐	☐
19. I believe that in order to meet the data use (analysis, interpretation, and communication) requirements of my current position, I had to learn on the job.	☐	☐	☐	☐	☐
21. As part of my graduate preparation in educational administration, I took one or more courses in statistics and/or data analysis.	☐	☐	☐	☐	☐
23. The following skill should be taught in administrator preparation programs - data analysis	☐	☐	☐	☐	☐
25. The following skill should be taught in administrator preparation programs - communication of data analysis	☐	☐	☐	☐	☐
27. The following skill should be taught in administrator preparation programs - data use for program planning	☐	☐	☐	☐	☐

Demographic Information:

1. Indicate the term that best describes your job title
   _____ Department Level (Coordinator)
   _____ Building Level (Principal/Assistant Principal)
   _____ District Level (Assistant Superintendent / Deputy Superintendent / Director / Superintendent)
   _____ Other, please specify_____

2. Years of experience in educational administration, including the present year _____?

3. Highest degree attained
   Baccalaureate
   Masters
   Certificate of Advanced Study, Second Masters, or Educational Specialist Degree
   Doctorate
   Other, please specify