

THE RELATIONSHIP BETWEEN PRINCIPAL RESPONSE TO ADVERSTIY  
AND STUDENT ACHIEVEMENT

By

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As members of the dissertation committee for Mark W. Williams, and on behalf of the Doctoral Program at Cardinal Stritch University, we affirm that this report meets the expectation, and academic requirements of the Ed.D. program in Leadership for the Advancement of Learning and Service.

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## Dedications

First and foremost, I wish to express my gratitude and love to my three wonderful children, Ian, Mallery, and Lindsay. You were the motivation to keep me striving ever forward, and you make the world a better place in which to live.

I wish to thank Lisa, the mother of my children and my friend. In the beginning, your push started me down this path.

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My sisters, Leigh and Erica, and my mom for putting up with me;

My friends at Burlington High School who never questioned but that I would accomplish this, though my sanity was always suspect;

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All good things I do, are God working in me and through me.

## Abstract

### The Relationship Between Principal Response to Adversity and Student Achievement

This study examines the relationship between a principal's response to adversity and student achievement, the relationship between principal and teacher's response to adversity, and principals' perceptions of adversity in education.

Research emphasizes the importance of the principal in influencing student achievement through the management of meaning within school culture, the nurturing of a collaborative work environment with teachers, and the fostering of a resilient school culture (Deal, 1987; Sergiovanni & Moore, 1989; Horne, 1997). A principal's adversity response plays a crucial role in the development of successful school climates and student achievement (Rosenholtz, 1989; Stoltz, 2000).

Using an ex post facto non-experimental research design, principals (n = 17) and teachers (n = 79) from the Flagstaff Unified School District of Arizona were asked to complete an Adversity Quotient (AQ) measure (Stoltz, 1997). AQ scores were compared to standardized student achievement data from the past two years. Additional qualitative data were gathered through five principal interviews.

The results of this study showed that students attained higher achievement scores in schools with higher AQ principals. The study also found that teachers' perceived control over their work environment may influence principal/teacher relationships and student achievement.

These findings suggest that principal response to adversity may influence school climate, teacher self-efficacy, and student achievement. The interview data supports the quantitative findings, and adds a rich description of the manner in which principals view educational adversity and their response to it.

These findings are important because individual adversity response is learned, and therefore can be changed and improved (Stoltz, 1997). By increasing educators' knowledge and understanding of educational adversity and AQ, school culture, teacher self-efficacy, and student achievement can be positively influenced, ultimately resulting in a more successful school.

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## CHAPTER 1

Paul Stoltz, the author of *The Adversity Quotient* (1997), compares leadership to mountain climbing. It is often up-hill against what at times may seem insurmountable odds. Leadership is hard work requiring diligence, knowledge, and commitment to the task. Educational leaders today have a daunting task. As a new generation of baby boomers fill the nation's classrooms, a record breaking 51.7 million children this year and climbing, schools are facing issues unheard of to previous generations of children (Gutherie and Reed, 1991). Protecting students from violence and drugs, lowering the teen pregnancy rates, and offering HIV/AIDS education are but a small sample of the emergent adversities with which educational leaders must contend. The content and the curriculum are no longer the sole emphasis in the classroom. How a leader responds to this adversity not only affects the leader's success, but the success of those he/she leads as well.

Principals typically are the educational leaders of their schools. They influence the conditions under which teachers teach and students learn. The manner in which principals respond to the adversities of their context and position, both internal and external, will likely influence the local educational culture, which in turn will likely influence student achievement. Principals that are able to create and maintain a learning climate that is resilient to the adversities inherent in modern education and society will provide students with increased opportunities to achieve. America must teach its children, alongside reading lessons or writing assignments, how to face and overcome the challenges they meet along the road to success.

This dissertation examines principals' self-perceptions of how they respond to adversity, and the causal influence a principal's response to adversity has on student achievement. This study transfers the ideas and concepts of Adversity Response to the educational realm and provides leaders with information and support to assist in making changes to the current educational system.

### General Background of Study

Education is a focus of both public and political debate and discussion. Reports and examinations of K-12 education over the past two decades have been critical of its ability to meet the needs of children in today's society (*A Nation at Risk*, 1983; *A Nation Prepared*, 1986; *Breaking Ranks: Changing an American Institution*, 1996).

A wealth of information has been written that points to the failures of public education. The charge for education to reinvent itself was generated by a push for reform from researchers, politicians, and the public. The process of bringing about this reinvention affects the very core of the structure and function of the education system. In 1971, Sarason wrote on the failed curriculum innovation known as "new math" that would propel American school children ahead of the Russians in the space race:

... the stimulus for change came primarily from outside the school culture; there was little or no attention to the characteristic regularities of the institutional culture and their possible social and psychological correlates; and there seemed to be the un verbalized assumption that the goals of change could be achieved independent of any change in these regularities. (Sarason, 1971, p. 36)

Continuing the call for reform, the current administration under President George W. Bush signed into law on January 8, 2001 the *No Child Left Behind Act* of 2001. This

current endeavor contains four basic education reform principles: stronger accountability for results, increased flexibility and local control, expanded options for parents, and an emphasis on teaching methods that have been proven to work.

Public anxiety about education continues to test the coping skills of school leaders. On the one hand, principals are expected to run a “tight ship”, coaxing every bit of performance out of institutions that must cope with limited resources and a rapidly changing society. At the same time, critics call for ‘reinventing’ schools to meet the challenges of the 21<sup>st</sup> century (Lashway, 1996, p. 1).

Education in America continues to change and evolve. Its constituency is better educated and demands a more thorough accounting of the educational process and its outcomes, especially in the area of student achievement. The paradigm is shifting from “teacher knows best” to a more collaborative community incorporating parents, students, educators, and research. In *Dance of Change* (1999), Peter Senge discusses the shifting of current “Mental Models” in both education and society. With any new alignment, comes adversity.

Although education has attempted to keep pace with our changing society, society’s unrealistic expectations and plans have not influenced the core of our educational system (Schlechty, 1992). The continued pressure for educational reform places ever-increasing demands on both resources and personnel. This increased emphasis on accountability and achievement places additional pressure on teachers to perform, students to learn, and principals to lead. The education community’s attempts at reinventing itself encompass a level of adversity with which school personnel must effectively handle. How principals, as educational leaders, respond to this adversity will

likely be mirrored in local educational settings by teachers and students. Thus, a principal responding positively to modern educational adversity lessens the negative impact it may have on student achievement.

Looking into the future of education, the next 20-30 years will likely be as or more turbulent than the past 20-30 years (Stoltz, 1997). The advances and changes in technology, biology, medicine, social values, demographics, the environment, and international relations hold a varied assortment of challenges and adversities for education (Senge, 1999). How education responds to these challenges and adversities will define its continued reformation and role in American society.

#### Statement of the Problem

A review of the literature and published articles reveal that the educational issues of today are dissimilar to those of decades past. In 1940, the top problems reported by teachers were as follows: talking out of turn, excess noise, running in the halls, cutting in line, dress code violations, lingering, and chewing gum. By the 1990's, the list had changed dramatically. It now includes: drug abuse, alcohol abuse, pregnancy, suicide, rape, robbery, and assault (Stoltz, 1997). With these changes, the world—including that of education—has become an increasingly adverse environment within which to work, play, live, and thrive (Stoltz, 1997).

During the past decade, a strong emphasis was placed on educational reform for economic and societal reasons. School districts have fallen under increasing pressure to increase student achievement and job readiness. Much of the recent focus has shifted to test scores as a measure of success. Conley (1997) suggested that this may help explain why there is such conflict between the business community and education with respect to

the value each places on the kinds of reform that have been proposed. This may also explain why measures of student outcome, other than test scores, may not be germane to policy makers' perceptions of whether or not reforms have been successful. He adds, "the most powerful and sustained calls for reform in education will likely come from outside the education profession" (p. 29). The lack of clarity and unity in the call for educational reform only adds to the frustration many educators feel.

The frustration over the ambiguity in the call for educational reform was echoed in a closing comment from a Canadian study on principal and teacher perceptions of reform, which concluded,

In the current context of adversarial relationships and mistrust, valuable resources are being wasted in the pursuit of goals of dubious value and in the defense of principles and positions, the preservation of which does nothing to improve the quality of education...New relationships must be formed, new goals must be agreed upon and a new spirit of cooperation must come to characterize the work of all those who believe that a healthy and effective public education system is fundamental. (Townsend, 1998, p. 40)

In overcoming adversity, the challenge exists not only of learning to cope with adversity, but also to make constructive use of it. Adversity establishes a climate, which encourages change, helps identify opportunities, generates immediate responses, and stimulates needed change in vision and purpose (Culbertson, 1974).

#### Purpose of Study

The purpose of this study was to look in a quantifiable manner at leadership response to adversity and the influence that response has on student achievement, teacher

response to adversity, and a principal's perceptions of adversities' effect on school climate. The two quantitative research questions and supporting qualitative research question of this study are:

- What is the relationship between a principal's response to adversity and student achievement as measured by standardized tests? Further, what are principals' perceptions of their ability to effectively deal with adversity?
- What is the relationship between a principal's response to adversity and the classroom teacher's response to adversity?

Response to adversity was measured using an instrument developed by Stoltz called the Adversity Response Profile, (ARP). Data from this questionnaire were numerically coded to arrive at an Adversity Quotient (AQ). Stoltz claims that the AQ measure will strengthen the effectiveness of leaders and, in turn enhance the effectiveness of those lead. This premise is based on the evidence that once an individual or organization sees how it responds to adversity, it can improve those responses and thereby improve overall effectiveness.

This study gathered additional quantitative and qualitative information on how principals respond to and deal with adversity. To further this purpose, this study also examined evidence obtained through interviews focused on principal's self-perception of their response to adversity.

Although significant research has been conducted in the areas of student achievement and leadership effectiveness, little research has attempted to link specific attributes of leadership effectiveness, such as response to adversity, to student achievement. The purpose of this study was to examine behavior, and to see if



relationships may exist between response to adversity and student achievement that suggest causality. The ultimate end of this research seeks to assist students in achieving academic success by examining one component of school climate, principal's response to adversity.

### Definitions of Terms

The definition of terms is critical to the understanding of any research. It is vital that the researcher and the reader have a clear understanding of the variable or variables being tested and their interrelatedness. Several terms used in this research are difficult to define. As language changes, so do the meanings of the terms used in public conversation and in research. Additionally, some terms have wide and varying accepted usage in general language. Terms such as honor, courage, leadership, and research fall into this area. The definitions provided are to aid in the clarity and understanding of the terms used and their importance in the research.

#### *Adversity*

The American Heritage Dictionary, Second College Edition (1976) defines adversity as a "state of hardship or affliction, misfortune." Stress, conflict, hardship, misfortune, danger, and challenge are but a few synonyms of adversity. Adversity can be both a general condition and a specific situation. In this dissertation, and from the sample examined, the functional definition of adversity is the strain, hardship, challenge, and emotional stress caused by the general need for education to reinvent itself in the 21<sup>st</sup> century, and the specific situation of the increased demands placed on principals and teachers by the governing board to raise or maintain standardized test scores.

The schools where this research was conducted were mandated to develop three goals that would assist in reaching the district's goal of raised test scores. A mitigating factor in this situation was the passage of proposition 301 by the people of the state of Arizona. Proposition 301 directs millions of dollars from the state budget to local school district budgets to be allocated to teachers in schools that successfully meet their academic improvement goals. Thus, the specific adversity was the pressure to meet stated goals including the increase or maintenance of standardized test scores. In passing Proposition 301, the State of Arizona allowed teachers to receive merit pay based on a schools ability to meet specific achievement and participation goals.

Additionally, the Flagstaff Unified School District (FUSD), the specific context of this research, gave teachers and administrators a 7-8 percent pay increase to diminish the existing disparity between current FUSD salaries and those of the larger metropolitan areas such as Phoenix and Tucson. Though this raise was well deserved, it would necessitate the reduction of the teaching force by about 31 teachers. The above-discussed context constitutes the specific adversity facing the FUSD principals, teachers, and students. Thus, adversity, for the purposes of this research, was both a general state and a specific situation.

Adversity affects individuals and institution on a regular basis both globally and specifically. Principal response to adversity is the central component of this research. The literature review discusses in detail the prevalence, impact, factors, and responses to adversity.

### *Resilience*

Resilience is the successful adaptational response to high risk or adversity. Conceptually, it is the outcome of both individual attributes and environmental effects (Fraser & Richman, 1999). The importance of resilience to this study lies in its relationship to adversity. Whereas adversity is usually thought of in terms of external influences or events and circumstances occurring outside the individual, resiliency is viewed in terms of internal personal responses to these outside or external influences and events.

For the purposes of this study, resilience was the ability of principals to influence school conditions that allowed for the maintenance of stated student achievement goals given the general state of adversity within education, plus the additional specific adversity caused by the demand to increase or maintain test scores coupled with a reduction in the work force. The literature review in Chapter 2 highlights the current research relevant to resiliency and its relationship to adversity response.

### *Leadership*

Rost (1993) writes of leadership that it "...is an influential relationship among leaders and followers who intend real changes that reflect their mutual purposes" (p. 102). Principals are often referred to as instructional leaders. In this dissertation, leadership was defined as the attributes, behaviors, and actions that aid a principal in influencing others to reach stated goals and objectives. The role of the principal as leader is also critical in influencing adversity response, both individually and institutionally. Culbertson (1974) maintains that, "An immediate leadership challenge is the attainment of better understanding of the sources of education's adversity and of their implications

for change” (p. 253). A detailed analysis in the Literature Review examined the influential relationship of the principal, as the educational leader within an institution, on teachers, school climate, and student achievement.

One of the more challenging tasks in educational leadership is to come to an understanding of what is or is not important within the educational climate that positively influences student achievement. “The quest to understand leadership is endless. We persist in our search because it goes to the heart of the human condition: our dual human nature, as symbolic and physical beings...Leaders help us to link these twin dialectics, one deeply individual, the other broadly societal...” (Lipman-Blumen, 1996, p. 343). Leadership assists students and faculty in understanding the importance and role of education within the broader societal context.

#### *School Culture and Climate*

In this study, the terms “culture” and “climate” were used as synonyms to refer to the pervasive patterns, beliefs, attitudes, and expectations that exist within an educational setting. The educational setting may refer to an individual school building, a school district or in a broader sense the entire nation. Culture is a learned process of expectations and norms that includes the assumptions, beliefs, and perceptions that the school community and community at large hold about their work (Sergiovanni, 1996). These norms and beliefs are often unconscious, yet they are critical in shaping the school environment (Peterson & Deal, 1998). School culture is one the foremost mediums through which influence is shared and disseminated. The role of school culture or climate in influencing student achievement is discussed at length in the next chapter.

### *Adversity Response Profile (ARP) and Adversity Quotient (AQ)*

The Adversity Response Profile (ARP) is a quantitative measure of a person's reaction to adversity (Stoltz, 1997). The adversity may be general or specific, internal or external, but is defined primarily by individual interpretation. It is composed of 30 Lickert scale scenarios assessing a respondent's attitudes and beliefs regarding adversity and their reaction to such. A resulting numerical score, called an Adversity Quotient (AQ), was given to each respondent based upon reported answers. There are also four sub-components: C, O, R, and E. C is the amount of perceived *control* one has over an adverse event or situation. O is the degree to which an individual is willing to *own* the outcome of adversity, the origin of the adversity. Owning the outcome reflects accountability. R is a reflection of how far the adversity *reaches* into other aspects of an individual's life. E is the measure of *endurance*, which assesses how long the adversity and the causes of the adversity will last in one's life.

ARP and AQ are copyrighted measures developed by Stoltz in his work on adversity. The ability to manage adversity is learned and thus our potential to increase our ability to handle adversity in a non-debilitating fashion exists. A copy of this measure, along with validity and reliability indices for this measure can be found in Appendices A and B.

### *Standardized Test Scores*

The standardized tests scores used for this study were implemented by the state of Arizona. The Stanford-9, a norm-referenced test, and the Arizona Instrument to Measure Standards (AIMS), a criterion-referenced test, are currently used. A norm referenced test compares a student's achievement with a representative national sample of other public

school students of the same age and grade. In contrast, the AIMS test is an effort to receive statewide evidence of the success with which the state developed standards have been incorporated into curriculum and instructional practices at the local level.

#### Importance of study

Response to adversity is a crucial element of emotional climate. One of the many roles of the principal is in shaping a positive school climate. School climate, especially emotional climate, cannot be divorced from learning (Tran, 1994). Thus, student learning is linked to climate and to principal and teacher perception of such. Stephan Stolp (1994) of the University of Oregon notes that increased student achievement and motivation correlate strongly with a healthy and sound school. Furthermore, the most effective changes in school culture occur when principals, teachers, and students model the values and beliefs important to the institution (Stolp, 1994). It is the responsibility of principals to nurture the traditions, ceremonies, rituals, and symbols that express and reinforce a positive school climate, and thereby offset the negative influences of adversity.

In developing and disseminating this study, the importance and relevance of a principal's adversity response to educational adversity, and the influence that response has on school culture, teacher efficacy, and student success may be better understood. Based on the accounts previously discussed, educators are facing increasing adversity in their workplace environment. It is the belief of the researcher that as educational leaders learn to handle adversity more effectively, teachers and students will have increased achievement. Behavior can change. Individuals can learn to respond more positively to adversity, thus minimizing its impact (Stoltz, 1997).

This study set out to see if there were statistically significant differences in student achievement as influenced by principal adversity response. The specific areas that may benefit from the completion of this study are as follows:

- (1) This study may provide valuable information to the Arizona School Administrators, Inc. related to how principals face adversity in their positions.
- (2) This study may initiate dialog between groups of educators on the influence of adversity on student success.
- (3) This study may extend the use of the ARP and the AQ phenomenon to school leaders and others in education, thus providing a greater depth of knowledge to the existing theory.
- (4) This study may create a body of knowledge that school leaders may use to improve adversity responses of individuals in their organizations.
- (5) This study may contribute to the ongoing discussion of how educators in our society face the challenges and adversity of modern education.

### Conclusion

Education is under increasing pressure, both internal and external, to reinvent itself. The call for accountability is echoed by business, government, and the populace at large. Educational leadership, including the building principal, is held increasingly accountable and responsible for student success. The call for education to reinvent itself has established a condition of adversity to which educators must respond. This adversity was both general, the need for increased accountability nationwide, and specific, the circumstances particular to Flagstaff Unified School District.

The purpose of this research is to examine the influential relationship between principals' response to adversity and student achievement, as well as, principals' perceptions of the affect adversity has on student achievement and school climate. Additionally, this study examines the influential relationship between principal response to adversity and teacher response to adversity.

Chapter 2, the Literature Review, reviews the current literature and research on resiliency, adversity, the role of the principal, teacher effectiveness, and school climate. This literature review explores the importance of the principal in establishing school culture and subsequent impact school culture has on student achievement.

Response to adversity is one component of school culture over which the principal exercises control as the educational leader of the school. Resiliency is the final area of investigation in this research. Resiliency, like adversity, is applicable to both individuals and institutions. The literature review examines the interrelatedness of a principal's response to adversity in the development of school culture and the subsequent influence that response has on teachers and student performance.

Chapter 3 reviews the methodology, instrumentation, data collection, and data analysis. In Chapter 4, the data are analyzed and results presented. Chapter 5 reviews the findings and presents conclusions, implications for practice, and recommendation for future research.



## CHAPTER 2

### Literature Review

This review examines research pertaining to adversity, and resiliency and their relationship to the principal. Additionally, this literature review focuses on the related aspects of the principal's role in education, leadership, teacher effectiveness, and school culture. The literature review is presented in two sections. The first section demonstrates that school principals are educational leaders, and as such influence both the development of school climate, and teacher effectiveness, which in turn influence student achievement. The second section is a review of the research on adversity and resiliency, which includes an examination of the negative factors that impact and influence daily life, and the means by which individuals overcome or succumb to such circumstances. The linkage between these two sections is the main focus of this study, namely the assertion that the principal's response to adversity influences, and is a part of, school culture, and this in turn influences student achievement.

#### Principals, Teacher Effectiveness, and Climate in Education

Educational leaders provide a key element in student success as measured by student achievement. The principal is responsible for leadership in a school. It is, in part, the principal's role to inspire the educational community to action, serve as an instructional leader for teachers, build rapport with students, respond effectively to the demands of district offices, and somehow still manage to react to a multitude of unrelated interruptions during a typical workday (Moller, Pankake, Huffman, Hipp, Cowan, and Olivier, 2000). Unfortunately, by the year 2020, the majority of America's public

school students will be living under conditions that place them at risk of educational failure (Irmsher, 1997). In education, principals are expected to manage such chaos, and to help the students and teachers be successful amid this turmoil.

### *The Role of the Principal as Leader*

The definition of leadership is changing (Rost, 1991, Lipman-Blumen, 1996, Senge, 1994). For years, we have held to the myth of the hero-leader. That special person blessed with the gifts of command and influence. These rare individuals who, “become leaders precisely because of their unique mix of skills, ambition, vision, charisma, and no small amount of hubris” (Senge, 1999, p. 11). The idea of school leadership being the heroic change agent in education is giving way to an alternate concept of leadership. This new leadership is “...a complex interaction among the members of an organization, in which context rather than position usually determines who will take the lead” (Deal, 1992, p. 3). Influence and vision are replacing directives and management.

During the past fifteen years, principals have been asked to switch from an instructional leader model with its firm control of goal setting, discipline, and evaluation of results to a facilitative model that emphasizes team building, network creation, and governance from the center (Lashway, 1996). These changes in the structure of educational leadership constitute a part of the educational adversity that affects principals, teachers, and students.

The arena in which these events are occurring is the local schoolhouse and climate creation is a major avenue through which principals effect change and exert influence. Goldman (1998) asserts that, “In a learning environment, leadership style says everything about the leader’s deeply held educational beliefs—and these are mirrored in

the culture of the school” (p. 20). Therefore, a school reflects in its culture the values or the lack of values of its leadership. By looking at the tone and educational climate of a school, one is in fact viewing the essence of a leader’s values and beliefs about how people learn. The actions of the principal are noticed and interpreted as what is important (Stolp, 1994). Goldman (1998) states, “Good kindergarten practice is good leadership practice. It’s about acknowledging that each person has different gifts, strengths, and concerns and then finding a way to utilize them. It’s about giving teachers a sense of understanding, empathy, partnership, and belonging” (p. 22). Furthermore, Goldman concludes, “Sensitivity to the role of leader means both examining practice and examining the values that determine practice. Leaders who look to the school to be a reflection of their educational beliefs must recognize the consequences—intended and unintended—and use them in rethinking their leadership” (Goldman, 1998, p. 22).

The role of the principal in influencing student achievement was further supported by Maehr’s (1990) work for the *National Center for School Leadership*, which linked principals’ leadership to students’ motivation. Using path analysis, he constructed a causal model linking school climate to teacher and student motivation, which in turn linked teacher and student motivation to student achievement. This was supported by the findings of Hallinger, Bickman, and Davis (1990) in analyzing data from the Tennessee School Improvement Project who concluded that a causal relationship could be found between principal leadership and student learning. Similarly, in an earlier study, researchers at the Far West Laboratory for Educational Research and Development (Bossert, Dwyer, Rowan, & Lee, 1982) indicated that principals influence student learning by influencing two key variables: instructional climate and instructional

organization. In expanding this view, Heck, Larsen, & Marcoulides (1990) concluded that principal leadership variables influence school governance, instructional organization, and school climate, which in turn directly affect student achievement

Another area of principal influence affecting schools and student achievement is that of educational reform. Researchers have documented that principals play a critical role in influencing reform initiatives and were recognized as instrumental in the complex process of affecting school improvement and organizational change (Hall & Hord, 1987; Hallinger & Murphy, 1985; Leithwood & Montgomery, 1982). Their role is best defined as “change agents” who facilitate the process of reform. Reform movements often have a direct bearing on the resources available to educators and their dissemination.

Although the role of principal as educational leader continues to be analyzed and refined, research has verified the fact that school culture is reflective of the cooperation and mutual respect for the total school population (Goodlad, 1984). This culture creates a positiveness, which in turn leads to an effective learning environment for faculty and students. Principals are ultimately responsible for the instructional effectiveness of schools. All members of the school must feel comfortable sharing, delegating, and assuming aspects of responsibility. Effective principals realize that adversity and change are both a personal and a social phenomenon. As they develop an awareness and knowledge base about the change process, they will become more effective at managing staff conflict and resistance (Chamley, Caprio, & Young, 1994).

Principals shape, facilitate, and foster the development of norms, values, and beliefs. These elements intimately shape the school’s culture, ethos, and climate (Purkey & Smith, 1983). Vandenberghe (1988) found that the essential element in change

implementation is the meaning given to the change. Unless principals put forth an extra effort to give meaning to change for both teachers and students—by relating it to an overall vision for the school and by constantly reinforcing that vision through frequent interactions with teachers and students—then the motivation to implement change will not last.

### *Teacher Effectiveness*

An equally important influence in student achievement is teacher effectiveness, which is influenced by both school climate and the principal. The intense pressure on school leadership for change and reinvention is mirrored in the classroom by teachers. In some cases, teachers are expected to respond to new initiatives or reforms by changing their deeply held beliefs about pedagogy, learning new content and skills, and then applying this new knowledge to move students to higher levels of achievement (Newmann & Wehlage, 1995; Sykes, 1999). These complex demands on educators, both administrators and teachers, are situated in a unique culture shaped by limited time and resources, inflexible structures, and unrealistic expectations (Coyle, 1997; Donaldson, in press). This adversity may explain why teachers often leave their profession when they feel unchallenged, out of control of their lives, and do not have a sense of belonging (Hill, 1995).

Teachers' response to change and its inherent adversity have often been characterized as resistant. The advent of reforms such as new technology, block scheduling, and shared decision-making lend support to the concept of adversity caused by educational reform. Chauvin (1992) found that teacher hesitation stems from a

perception of differing organizational roles. Teachers are grounded in how adversity affects their daily lives and the lives of students.

Martin (1990) concluded that from earlier reform movements emerged the notion of principal as instructional leader. In this model, it was presumed that much of the achievement score decline was the result of poor teacher performance. Therefore, to help teachers meet performance standards, principals were placed in charge of teacher performance. Principals were given the power to influence teacher performance and determine decisions about pay, retention, and promotion. This, in part, may explain why teachers often view principals as adversaries.

Andrews, Soder, & Jacoby (1986) concluded that teachers' perceptions of the principal as instructional leader are critical to the reading and mathematics achievement of students, particularly among historically low-achieving groups of students. In an interview with Brandt (1987), Andrews stated:

Frankly, I never anticipated that we would find such a powerful relationship between leadership of the principal and student outcomes. After all, the principal is one step removed from the direct instructional process. But, what we found is that the teachers' perceptions of their work environment is so important, the power of the principal's leadership so pervasive, that it has a measurable impact on student learning. (p. 16)

To assist in overcoming this perceived adversarial relationship, Lyman, Morehead, and Foiled (1988) identified three qualities necessary for the establishment of trust in a collaborative team environment: the teacher must believe that the information gathered by colleagues will not somehow be used evaluatively; sufficient time for

building trust must be provided so that the anxiety about the process can be reduced and ultimately eliminated, and the individuals must have the patience for building a trusting team relationship. This points to the importance of mutually influential and collaborative relationships between principals and teachers. A vital component of building a collaborative educator team is self-efficacy.

Self-efficacy is related to the control individuals perceive they have over events and circumstances. Bandura (1995) defines perceived self-efficacy as, “beliefs in one’s capabilities to organize and execute the course of action required to manage prospective situations” (p. 3). As stated in the aforementioned paragraphs, teachers have often viewed their relationship with leadership as adversarial because of their perceived loss of control over their teaching environment. This perceived loss of control was brought about, in part, by the call for reform and the instructional leadership model. People strive to exercise control over their lives and the events that affect them (Bandura, 1995). The inability to affect events that adversely affect one’s life can lead to apprehension, apathy, and a feeling of “us against them.”

Teacher self-efficacy, as argued by Bandura (1977) and Gidson and Dembo (1984), is based on two distinct beliefs: (a) that a particular behavior will lead to desired outcomes, and (b) that one has the requisite skills to bring about the desired outcome. The importance of teacher self-efficacy in influencing student achievement is exemplified in the following statement of (Gibson and Dembo, 1984), “Teachers who believe that student learning can be influenced by effective teaching, and who also have confidence in their own teaching abilities would persist longer, provide a greater academic focus in the

classroom, and exhibit different types of feedback than teachers who have lower expectations concerning their ability to influence student learning” (p. 570).

Equally essential to the building of a collaborative educational environment is trust. The results of a study by da Costa and Riordan (1996) on teacher self-efficacy and the capacity to trust found that the degree of trust established seems to greatly impact the issues that become the focus of a collaborative process. Furthermore, they found that time was a critical factor in the ease of sharing sensitive topics. Teachers who have high levels of teaching efficacy are more likely to allow other teachers or administrators into trusting professional relationships more readily than teachers with lower teaching efficacy (da Costa & Riordan, 1996). This indicates that increasing trust in professional relationships is linked to self-efficacy. These two factors appear to be mutually influential. An additional component of increasing teacher self-efficacy is a unified vision within the school culture.

All schools have norms and values, a principle or authoritative standard by which behavior and expectations are measured, yet what sets high achieving schools apart from those which are less effective is not simply the presence of particular norms and values, but the fact that most faculty members support them (Firestone & Corbett, 1988). In high achieving schools, teachers have a common sense of purpose, high expectations for students, and available resources and opportunities to plan their own solutions to problems (Rosenholtz, 1989; Sergiovanni & Moore, 1989). Teachers in high achieving schools have both a sense of autonomy and collaboration.

Teacher effectiveness is in no small part related to self-efficacy. Teacher self-efficacy was influenced by the principal and the sense of control teachers perceived they



had over their environment. There exists a mutually influential relationship between principals and teachers that affects student achievement.

Thus far, this literature review has examined the influence of the principal and teacher effectiveness on student achievement. A final element influencing student achievement, in this study, is that of school culture.

### *School Culture and Climate*

School culture or climate is the usual setting within which the principal-teacher-student relationship occurs and exchanges influence. Culture is a learned process of expectations and norms, and it is an important factor relative to improving schools and student achievement. Culture is defined by Gibson, Ivancevich, & Donnelly (1985) as a unique system of values, beliefs, and norms that members of an organization share. While Deal & Kennedy (1982) define culture as an abstraction that ties to the unconscious side of the organization. Culture consists partially of recurrent and predictable behavior patterns known to members of a community (Firestone & Corbett, 1988). Core values of school culture are beliefs, assumptions, and perceptions that school community members hold about their work. These factors together comprise a theory of organizational acceptability that guides how people behave and operate (Sergiovanni, 1996). Culture provides a set of given expectations that both influences and is influenced by its constituents.

Peterson and Deal (1998) in addressing the vital role of school culture state, “School leaders—principals, teachers, and parents—are the key to eliminating toxic culture and building positive culture” (p. 28). Peterson and Deal discuss the role of school environment in shaping the unconscious norms and beliefs held and acted upon by

teachers and their students. Though difficult to define, school culture is one of the most ignored and yet significant features of any school enterprise. Norms influence beliefs and attitudes, which in turn direct behavior. The result of this behavior is often expressed in student achievement.

The key components of setting school climate are administrators, teachers, and parents. Critical to a student-affirming school culture is recognition of student achievement and teacher creativity (Peterson & Deal, 1998). The attitudes of teachers, students, parents, and the community at large toward education is linked inextricably to the influence of school leaders on instructional climate (Renchler, 1992). A further aspect of school culture, motivation, is linked to goal attainability and goal importance. Students are more motivated to learn in schools with strong cultures (Fyans and Maehr, 1990). High academic expectations within a school norm would lead to higher student motivation, which in turn would lead to higher student achievement. This is explained in part by psychological concept of the self-fulfilling prophecy. Students in higher achieving schools achieve higher, partly because it is the cultural expectation.

In achieving a culture of high expectation, Leithwood and Montgomery (1982) maintained that at their highest level of effectiveness, school administrators come to understand that people are normally motivated to engage in behaviors, which they believe will contribute to goal achievement. Summarily, goal achievement as an aspect of school culture represents the historically transmitted pattern of meaning (Geertz, 1973).

Meyer and Rowan (1983) explain why culture is so vital to the understanding of education:

Culture as a construct helps explain why classrooms and schools exhibit common and stable patterns across variable conditions. Internally, culture gives meaning to instructional activity and provides a symbolic bridge between action and results. It fuses individual identity with collective destiny. Externally, culture provides the symbolic facade that evokes faith and confidence among outsiders with a stake in education. (p. 505)

In furthering the explanation of the importance of meaning in culture and its relevance to educational change (Deal, 1987) states:

People develop attachments to values, heroes, rituals, ceremonies, stories, gossips, storytellers, priests, and other cultural players. When change alters or breaks the attachment, meaning is questioned. Often, the change deeply affects those inside the culture as well as those outside . . . The existential explanation identifies the basic problems of change in educational organizations as cultural transitions. (p. 6)

A demonstration of the importance of school culture and the interrelatedness of the influential relationships among principal leadership, teacher effectiveness, and school culture on student achievement was found in a major study undertaken in West Virginia. This study sought to determine why similar types of elementary schools are achieving at very differing rates of success for students. Some high achieving schools are producing successful students despite extreme poverty and dysfunctional home environments. In phase one of this study, a comparison between 33 high and 33 low achieving schools was conducted. In a second phase, the study narrowed its focus to three pairs of elementary schools with similar demographic and socioeconomic characteristics. In this study, both

the state highest and lowest achieving schools were included. The results showed a marked dissimilarity between high and low achieving schools in the opportunities provided students for success and achievement. An analysis of survey and interview data identified the following characteristics, which were shared by effective elementary schools in this study: (a) high student achievement irrespective of parent SES, educational background, or involvement; (b) low teacher turnover, combined with goal setting and teamwork; (c) high staff morale and strong teacher accountability; (d) a strong and determined attitude among teachers that students can and will achieve; (e) the ability of student services to offset the deterrents of poverty through music programs, field trips, and accelerated classes; (f) an identified instructional leader, be they teacher, principal, or superintendent; (g) and a principal with an open communication style who is supportive of teachers and academic programs (Hughes, 1995). The crucial findings in this study for the purposes of this research is the interplay among the three factors, principal leadership, teacher effectiveness, and school culture, that allowed for increased student achievement. These findings support the arguments provided earlier in this chapter that principal leadership, teacher effectiveness and school culture do influence student success.

In a subsequent study by Hansen and Childs (1998) overall school effectiveness was examined by looking at one school in particular and dissecting the components that made that school work well. Hansen and Childs viewed the facility of Orem School, Orem, UT. Key to the schools effectiveness, as defined by the authors, is treating students with respect. Orem has a climate of support and encouragement, where students and teachers alike were treated with warmth and acceptance. This atmosphere starts at the

highest administrative levels, which in this case is the principal. Reflection time and a risk-free environment are conducive to the learning climate maintained at Orem. The faculty and administration have initiated efforts to ensure that participation, cooperation, and collaboration characterizes decision-making (Hansen & Childs, 1998).

The results of the West Virginia study and the examination of Orem show that schools make a difference. Murnane (1983) asserts that the most important lesson learned from quantitative research on determinants of school effectiveness is that schools make a difference, teachers are a critical resource, that the composition of the student body matters, and that secondary resources such as physical facilities, class sizes, curricula, and instructional strategies may be seen as affecting student learning through their influence on the behavior of teachers and students.

#### *Conclusion to Section One*

Increased student achievement is not determined by any one factor, but rather by several factors working in concert. The focus of this research was principal influence and as such, there existed a significant relationship between principal behavior (such as adversity response, management of change, professional treatment of teachers, or articulating a clear school mission) and student achievement.

The values and beliefs of the principal as educational leader are reflected in the school climate, and the school climate influences student behavior and achievement. New strands of leadership are forming between principals and teachers that are based on mutual trust and communication. Self-determination and goal attainment are a vital part of teacher efficacy and student achievement. These themes are echoed in the research on adversity and resiliency that follow.

Effective leadership is linked to effective schooling and teaching. The principal's role and function in diverse organizational settings make it difficult to reach a consensus on effective leadership styles. However, it is clear that for educational leaders to meet the call to reinvent American education they will need to respond more effectively to ongoing societal and educational changes.

### Adversity and Resiliency

The topics of adversity and resiliency abound in philosophy and common clichés. Following are three examples that demonstrate the pervasiveness of adversity in common thought: “That which does not kill me makes me stronger” (Nietzsche) and “In the depth of winter, I finally learned that within me there lay an invisible summer” (Albert Camus). “I’ve never believed adversity is a harbinger of failure. On the contrary, (it) can provide a wellspring of strength” (Diane Feinstein, U.S. Senator).

Society is changing; adversity is on the rise. How individuals respond to adversity will be representative of how well that individual may handle the continuing challenges of life. Albert Bandura (1995) states in his text, *Self-Efficacy in Changing Societies*, “Life in societies of today is undergoing accelerated social and technological changes as well as growing global interdependence. These challenging new realities place heavy pressure on people’s capabilities to exercise some control over the course their lives take” (p. ix).

The focus of this research was to examine the influential relationship between principals response to adversity and student achievement. There is little research in the social sciences on the interrelatedness of adversity and leadership response. Adversity was often studied through its relationship to resiliency or analyzed by one of its synonym or components such as hardiness, risk, or stress inoculation.

The remainder of this literature review examines the research and literature in the areas of adversity and resiliency, and extrapolates their connectedness to student achievement through leadership adversity response. The following section discusses the research on adversity including its definition and influence, related factors, and the means and importance of overcoming adversity.

### *Adversity*

The world is changing in many powerful and significant ways. In his 1997 book, *The Adversity Quotient*, Stoltz asserts that, “today we face a crisis of hope...we are living in the Age of Adversity” (p. 38). Stoltz identifies three levels of adversity: societal, workplace, and individual. Societal adversity encompasses the continued shift in wealth, uncertainty about economic security, fear of violence and crime, environmental concerns, new definitions of family, and a loss of faith in institutions and leaders, including education. Workplace adversity results from the increases demands of getting ahead in the world of work coupled with a loss of trust and control. As people work harder and harder to get ahead, they are receiving less and less in return. Stoltz (1997) points out that the median net worth of the 35-44 year-olds dropped 33% since 1980. The accumulated burdens of societal and workplace adversities merge into individuals striving to be “all you can be.” These stressors lead to individual adversity (Stoltz, 1997). As these changes catch up to the individual, they can be overwhelming. The accumulated effects of the many levels of adversity faced by individuals can cause a loss of hope.

School leaders must adjust and respond to the adversity that exists on all three levels: from personal family, to events occurring outside the community’s boundaries, to

the stress placed on education both nationally and locally for increased accountability and student achievement.

### *Factors Related to Adversity*

The factors related to adversity are numerous, complex, and multidirectional. Adversity research draws heavily from studies in the area of cognitive psychology. One of the most important components of adversity is the theory of learned helplessness.

Learned helplessness attempts to explain why some individuals succeed in the face of adverse conditions while others stop or even retreat. Martin Seligman (1975) developed this landmark theory through experiments with dogs receiving electric shock. The experiment involves three groups of dogs and two phases. In Phase One, the dogs of Group A were harnessed and administered a mild shock. They could stop the shock by pressing a bar with their nose. The dogs of Group B were placed in the same harnesses and administered the same shock, however there was no way for the dogs of Group B to stop the shock. Group C was the control group; these dogs were placed in harnesses, but given no shock. Phase Two began the following day, when one at a time the dogs were placed in a device called a shutter box, a box with a low barrier down the middle. The dogs of Groups A and C quickly learned how to jump the barrier and get away from the shock. However, the dogs of Group B, who could not control the shock in Phase One, had a completely different response. These dogs just lay down and whimpered. They did not try to escape.

What Seligman and others have since discovered is that people are capable of acquiring this trait. Learned helplessness is internalizing the belief that what you do does not matter, it is about the loss of perceived control over adverse events.



Stoltz in his book *The Adversity Quotient* (1997) provides a summary of conclusions taken from the works of Martin Seligman, Christopher Peterson, Steven Maier, Carol Dweck and others on learned helplessness: (a) learned helplessness explains why people give up, (b) learned helplessness is a definitive barrier to empowerment, (c) once learned, it is easy to justify one's helplessness, (d) people can be immunized against helplessness, (e) the immunized against helplessness never give up, (f) the upsurge in depression is caused by an epidemic of learned helplessness, (g) optimists respond differently to adversity than do pessimists, (h) males and females are taught differently and, as a result, tend to respond differently to adversity, (i) learned helplessness can be taught to others and reinforced later in life.

One final study on learned helplessness with special relevance to education was conducted by Diener and Dweck (1978) and studied measures of learned helplessness in children. What they discovered was that helpless children attributed their failure at a task to a lack of ability, where as mastery-oriented children engaged in self-monitoring and self-instruction. Restated, helpless children focused on the cause of failure, while mastery-oriented children focused on remedies from failure. Additionally, it was found that helpless children do not view present success as a predictor of future success. This tendency of helpless children to discount success cannot help but have adverse effects on their persistence on a task in the face of obstacles.

Learned helplessness has special application to the field of education. With the call for education to reinvent itself and thereby provide increased student achievement and success, learned helplessness becomes a barrier to this empowerment. The ability of

principals to positively response to adversity will likely assist in overcoming the barrier of learned helplessness.

A factor strongly related to and emerging from learned helplessness theory is attribution theory. "Attribution theory concerns the process by which an individual interprets events as being caused by a particular part of a relatively stable environment" (Weiner, 1986, p. 135). Humans are motivated to try to understand the world and why an event has occurred. Attribution theory is concerned with perceptions of causality, or the perceived reasons for a particular event's occurrence. Weiner suggests that attributions for success or failure vary along the dimensions of stability, locus of causality (internal/external), and controllability. Relatively enduring causes indicated that past outcomes would be repeated, whereas variable causes indicated that the future might differ from the past. Locus of causality relates to self-esteem and pride in accomplishment following success and failure. Controllability relates to self-directed affects of guilt and shame. How individuals perceive adverse events influence their reaction to it.

The degree to which people view adversities as stable or temporary will affect their perception of their ability to control their environment and destiny (Stoltz, 1997). The attributes of the adversity determine the reaction to it. According to Seligman (1990) explanatory or attribution style is a strong predictor of success in many areas. Stoltz (1997) restates this by asserting that individuals who explain adversity as permanent, pervasive, and personal have pessimistic explanatory styles, where as those who explain adversity as temporary, limited, and external have optimistic explanatory styles.

Martin Seligman in reorienting his focus toward Learned Optimism insisted that the way in which people explain their life and its setbacks was learned in childhood. This modeling dictates, in part, whether an individual rises above circumstance or succumbs to them. Seligman explains that the fundamentals of optimism do not lie in positive phrases or images of victory, but instead in the way individuals describe why a particular event, whether good or bad, happened to him/her. Additionally, a crucial point was Seligman's insistence that a negative explanatory style can be changed to a positive one (Seligman, 1990). This translates into the ability of people to learn new responses to adversity. The optimistic individual perseveres, in the face of both routine setbacks and major failures. Optimistic leaders set the tone for the individuals that work for them and learn from them.

The idea of Learned Optimism was strongly reflected in Bandura's (1982) ideas about self-efficacy, discussed early concerning teacher self-efficacy, and Kobasa's (1979) concept of hardiness. Bandura proposed that no other kind of thought is more central to people's behavior than the judgment of their capacities to exercise control over events in their lives. Bandura stated that ordinary social realities are scattered with difficulties, impediments, adversities, frustrations, setbacks, inequalities, and unfair conditions. Bandura asserts that self-efficacy determines the amount of effort an individual will expend, and how long he/she will persist in the face of obstacles or adverse experiences. When confronted with adversity, people with self-doubt about their abilities will loosen the efforts, or even give up altogether. Individual with a strong sense of self-efficacy will persevere in the face of adversity and attempt to master the challenge presented. High perseverance was positively correlated with high performance levels (Bandura, 1982).

Bandura (1995) sums up the importance of self-efficacy in overcoming adversity by stating that, “the sociable, the nonanxious, the nondepressed, the social reformers, and the innovators take an optimistic view of their personal capabilities to exercise influence over the events that affect their lives. If not unrealistically exaggerated, such personal beliefs foster positive well-being and human accomplishments” (p. 38). Perceived control has a direct affect on how individuals react to adverse conditions that arise in their lives.

Similar to self-efficacy and learned optimism, hardiness is directly related to an individual’s ability to withstand the adversities inherent in today’s society. Hardiness, like optimism, is a strong predictor of physical and mental health in the face of adversity. Hardiness, an agricultural term used to describe a plant's ability to withstand the cold of winter, in humans refers to an individual's ability to withstand the harsh conditions of life. Kobasa (1979) lists three characteristics of hardy individuals: (a) the belief that they can control or influence the events they experience, (b) an ability to feel deeply involved in or committed to the activities on their lives, and (c) the anticipation of changes as an exciting challenge to further develop. According to Maddi and Kobasa (1984), a hardy person views potentially adverse situations as meaningful and interesting (commitment), sees stressors as changeable (control), and sees change as a normal aspect of life rather than a threat and views change as an opportunity for growth (challenge) (p. 50).

Stoltz further argues that hardiness is a predictor of health and overall quality of life because hardy people tend to suffer less and for a shorter period of time. Morris Okum, a psychologist at Arizona State University, found that women who were evaluated as hardier actually had a significantly higher number of T-cells, meaning their immune systems were stronger (Stoltz, 1997). An enhanced sense of self-confidence or self-

efficacy based on past adversities is used to help cope with new difficulties. Stoltz reiterates that hardiness, like optimism, is a strong predictor of an individual's physical and mental well being in the face of adversity.

Hardiness, attribution or explanatory style, self-efficacy, and learned optimism all play a significant role in an individual's ability to withstand and overcome adversity. Perceived control must begin with leaders, principals, and then disseminated through the faculty. Environmental factors influence adversity and its response. However, those who respond to adversity as an opportunity, with a sense of purpose and control, will succeed (Stoltz, 1997).

### *Overcoming Adversity*

Adversity exists and is on the rise. It is present in society, the workplace, and individual lives. This portion of the literature review explores another side of adversity, its perceived benefits and the use of AQ to assist in overcoming adversity. The idea that people can benefit from adversity is not new. Religious writings often discuss the role of adversity and/or suffering, in becoming a better practitioner of faith. The stories of lives changed and rebounding character after trauma are a staple of the popular press and personal conversation.

A study by Caplan (1964) suggests that in "stress inoculation" the struggle to cope with an adverse event can lead to increased coping skills, an enhanced sense of self-efficacy and hence an increased ability to prevent and cope with future stressors; as exemplified in the expression, "what doesn't kill me makes me stronger." Furthermore, according to McMillen (1999) people commonly perceive that they have benefited from extreme difficult life experiences, including natural, technological, criminal, sexual, and

health. These adversities manifest as a change in life structure, views of self and others, and in interpretations about the meaning and purpose of life.

Meaning is lost during a crisis, as the sudden or unlikely change in events challenges one's understanding of reality. Crisis and adversity as a universal human condition provide an interesting correlation to Eastern thought in that the Chinese symbol for crisis is a combination of the symbol for danger and the symbol for opportunity.

In the case of a severely adverse event, it may serve some people by signaling that it is time to re-evaluate life and perhaps make changes. Adversity may trigger increased self-awareness and examination of what is important in life. McMillen (1999) argues that for this type of life priority re-evaluation to occur an individual must be actively engaged in their environment and thoughtfully structure their lives to increase benefits and decrease costs. Overcoming adversity requires active participation. It cannot be done as a spectator, only as a participant.

Frankl (1962), a Nazi concentration camp survivor, wrote, "Suffering ceases to be suffering in some way at the moment it finds a meaning" (p. 115). The general proposition is that an adverse event, once perceived as meaningful or understandable, seems less harsh to the person who has experienced it. Perceived benefit from adversity is one way to help explain meaning in an event. Likewise, Janoff-Bulman, (1992) has suggested that victims of traumatic events cognitively restructure how they think about negative events to maintain previously held views of themselves and their world. The search to find meaning in adverse situations or occurrences relates to attribution theory in that people attempt to explain or attribute a cause, or come to an understanding of "why" an event or situation has happened.

Adversity, though usually perceived as negative or harmful, is not without beneficial effect. It is often an individual's reaction to adversity, not the adversity itself, which determines whether the outcome is positive or negative. Given the understanding of the cognitive psychology underlying adversity and its potential for benefit, the critical issues become the development of an effective means with which to respond to adversity, for both self and others. Adversity Quotient (AQ), a theory developed by Stoltz, was built upon the cognitive psychology discussed earlier in this section and provides a means with which to overcome or benefit from adversity.

The three elements of AQ are as follows: (a) AQ is a new conceptual framework for understanding and enhancing all facets of success, (b) AQ is a measure of how an individual responds to adversity, and (c) AQ is a scientifically-grounded set of tools for improving response to adversity. Stoltz's findings on adversity were built on the theories that have emerged from cognitive psychology in conjunction with 25 years of personal research and 16 years of application of the theory in the field. Together with AQ, Stoltz developed the Adversity Response Profile (ARP) to measure adversity response. AQ and ARP are defined in Chapter 1 and their implementation in this research is further elaborated upon in Chapter 3. A copy of the ARP measurement instrument along with validity and reliability indices is in Appendix A.

The importance of AQ for this research is the information it reveals about the manner with which principals respond to adversity in their educational settings. According to Stoltz AQ: (a) tells how well you understand adversity and your ability to surmount it, (b) predicts who will overcome adversity and who will be crushed, (c) predicts

who will exceed expectations of their performance and potential and who will fall short, and (d) predicts who will give up and who prevails (Stoltz, 1997).

The means through which AQ improves adversity response was built on the work of Albert Ellis and his ABC model (Stoltz, 1997). “This rational-emotive model of behavior is based on the notion that it is one’s belief about an event rather than the events themselves that generate reactions and feelings” (p. 149-150). Expanding on the work of Ellis, Aaron Beck formulated a model of cognitive psychology that emphasized the need to challenge or dispute negative beliefs about oneself, the present event or situation, and the future. Additionally, this model helps people recognize, assess, and dispute their reactions to life’s events. According to Stoltz (1997), the importance of these models in cognitive psychology is that unlike “most training which loses its impact over time, one of the most powerful findings from these studies has been that the effect of cognitive disputation skills seems to take on a life of its own, expanding and growing long after the training” (p. 150). AQ alters how individuals view adversity and their response to it, both in current circumstances and in the future.

AQ applies to institutions as well as individuals. The ability of individuals within an educational setting to withstand and effectively manage adversity will greatly influence its success. AQ affects an organization’s agility, resilience, persistence, creativity, productivity, longevity, motivation, risk-taking, stamina, health, and success (Stoltz, 1997). The characteristics of an organizational setting that allow for its successful or unsuccessful response to adversity are in educational terms called school culture. As an educational leader, the principal is responsible for guiding and directing faculty and students through challenging events and times. A leaders understanding of adversity



(both current and emerging), its aspects and influences, and an effective means with which to overcome adversity (both personally and as a leader) will influence teachers and students toward success.

#### *Adversity: Conclusion*

The manner in which an individual responds to adversity is based on the interrelatedness of several factors: their sense of learned helplessness or learned optimism, their stress inoculation, their degree of self-efficacy and hardiness, and finally their sense of meaning and purpose. The evidence provided by Stoltz and others leads inextricably to the conclusion that people can be shown how to improve their response to adversity. The principal's role as educational leader and climate influencer requires that he/she effectively respond to the adversities effecting individuals within the school setting and the institution itself. This response, like that of any individual, is determined by several factors and can be changed and improved. As the principal's response to adversity improves, so increases the likelihood of a school climate conducive to higher student achievement.

#### *Resiliency*

In today's educational literature, it is not uncommon to see the term resilience used when describing the characteristics needed by students to be successful. At the heart of this idea is the notion that resilient children have a greater potential to develop into healthy, productive, and competent adults despite experiences of severe stress and adversity. Education is under increasing pressure to produce more successful students. The research on resilience, like that of adversity, points to the individual and institutional characteristics and conditions that influence success when faced with challenges.

According to Carver (1998), there exists four possible consequences of adversity: continued downward slide, survival but in a diminished or impaired state, a return to pre-adversity levels of functioning, or surpassing previous levels of function in some manner. To be resilient, one must be exposed to adversity or risk and respond successfully by either returning to or surpassing previous levels of function. Fraser and Richman (1999) view resilience as the transactional product of individual attributes and environmental contingencies. Meaning, a resilient person incorporates a degree of self-efficacy, optimism, hardiness, and an external event and limited reach attribution style within a supportive setting or culture.

People are malleable; therefore, resilience must be distinguished from simple survival. Whereas, survivors were characterized by immobilization from anger and absorption in victimization, resilience was reserved for unpredicted or markedly successful adaptations to negative life events, trauma, stress, or other forms of risk (Wolin & Wolin, 1993). Understanding what helps some people function well in adversity will enable incorporation of that knowledge into practical strategies for educational leadership and student achievement through the principal's response to adversity.

### *Creating Resiliency*

Highly stressful circumstances are usually characterized by the possibility of harm. Sometimes there is also an opportunity for gain. These conditions often occur together, although based on our perception, we label them differently (Lazarus, 1996; Lazarus and Folkman, 1984). Risk is the term often used in resiliency research to convey

the notion of possible harm or negative outcome associated with an experience or event. At-risk applies to people, families, groups, and institutions (Fraser & Richman, 1999).

The opposite of risk factors may be thought of as protective factors. In a study by Werner (1996), five clusters of protective factors were identified as (a) personality traits that influence benefit in social situations such as being easy going and deliberate; (b) skills and values that lead to maximizing opportunities in context of personal limitations such as tenacity, responsibility, and positivism; (c) family support and structure that includes self-efficacy; (d) adults and extended family members that might assist in solving problems or in providing guidance at points of transition; and (e) opportunity structure that opened chances for supplemental education and training through the military, community colleges, job training, or agency programs.

The above mentioned key protective factors found in families, schools, and communities were also summarized by Bernard (1991) as a caring and supportive relationship with at least one person, consistently clear, high expectations communicated to the child, and ample opportunities to participate in and contribute meaningfully to one's social environment.

Child resilience studies have established that children can thrive in adversity and achieve competence in the presence of certain protective or stress-resistant factors and within a supportive environment. In establishing the importance of this research, O'Leary (1998) asserts that the concept of resilience has the potential to inform our understanding of any individual, organization, or society confronted with profound challenge.

A supportive school environment and faculty may explain why according to Bernard (1993), teachers, often unbeknownst, have the power to tip the scales from risk

to resilience. This successful development and transformation occurs between pupil and teacher from a deeper level of relationship, beliefs, and expectations, and a willingness to share power (Bernard, 1993).

### *Thriving*

Inherent in any profound challenge is the potential for crisis or opportunity. Crisis and opportunity exist on multiple levels: individual, organizational, and national.

O’Leary examined and explored a variety of individual and social resources hypothesized to promote thriving. The world abounds with men, women, and children who, with strength and courage, grace and humor, resolve and hard work, rise above their circumstance of adversity. We see these modern-day heroes all around. “Occasionally someone comes along who uses personal experience to inspire others in a more public way” (O’Leary, 1998, p. 123).

Individuals that thrive may reflect decreased reactivity to subsequent adversity, faster recovery from such, and/or consistently higher level functioning. Thriving may reflect gains in skill, knowledge, confidence, or a sense of security in personal relationships. Carver attributes these gains to the notion of confidence and mastery as being self-perpetuating (1998). Furthermore, Carver believes that work in this field is important because it helps to understand the human condition, “Thriving reflects the noble side of the human experience, making something good out of something bad” (p. 245).

Krovetz and Speck (1994, 1995) have applied the notion of thriving to school systems and its students. Caring environment, lower student-teacher ratios, personal mentors, high expectations, and high involvement are necessary for a thriving school

community. In brainstorming about an ideal educational community, teachers and administrators generated an idea of what this community would look like. A caring environment would be expressed through lower student-teacher ratios, and assignment of personal mentors to all students. High expectations would exist for everyone, as well as expectations of high involvement in school decisions including community service. Additionally, the school community would operate as a cooperative learning environment with movement from a remediation model to an achievement oriented model (Krovetz and Speck, 1994, 1995).

### *Organizational Resiliency*

Adversity and resiliency apply to organizations, as well as individuals.

Organizational resilience is the ability of a system to withstand the stress of environmental “loading” based on the combination/composition of the system pieces, their structure and interlinkages, and the way environmental change is transmitted and spread in the organization (Horne, 1997). The adversarial relationship between principals and teachers, as based on the instructional leader model, is an example of organizational adversity. Organizational resilience relies on a number of strands: communication, commitment, consideration, connections, and community. Relationships and information appear to be key in the development of resilient organizations (Horne, 1997). Such is exemplified in the principal as facilitator model of educational leadership. “All organizations are merely embodiments of a very old, very basic idea—the community...An organization’s success has enormously more to do with clarity of common purpose, common principles, and strength of belief in them than to assets, operating ability, or management competence, important as they may be”, (Waldrop,

1996, p. 84). Terrance Deal's (1996-97) work in organizational culture endorses the significance of leaders as managers of meaning. Though many unknown aspects of school culture still exist, the management of meaning plays a "critical role in organizational effectiveness" (p. 5).

#### *Resiliency: Conclusion*

Resilient research shows that supportive environments are essential to the resiliency of the school culture. Principals must make the commitment to foster resiliency in their faculty and staff before students can be expected to adopt resiliency as an essential personality for success. Resiliency is both a set of personal characteristics as well as a supportive environment, and as such makes it possible to overcome adversity. The role of the principal as educational leader is to utilize personal resiliency characteristics, and as a climate creator to assist in the development and implementation of a supportive environment.

Educational leadership must come to "the proud awareness" that their work in schools is "the most worthy of societal enterprises...the enhancement of competence in their children and their tailoring, in part, of a protective shield to help children withstand the multiple vicissitudes that they can expect of a stressful world", (Garmezy, 1991, p. 427).

"The starting point for building our student's capacity is the belief by all adults in their lives, particularly their school, that every youth has innate resiliency. To develop his belief, educators and administrators need to recognize the source of their own resilience" (Bernard, 1997, p. 1).

### Conclusion to the Literature Review

The literature review confirms the importance of the principal in influencing student achievement through response to adversity, the modeling of resiliency and the fostering of a resilient school climate. School climate affects both teacher efficacy and student achievement. The establishment of this school climate is based in no small part on the principal's ability to foster an atmosphere resilient to the adversities of modern day education. The importance of creating meaning, effective communication, and expression of belief are themes that run throughout the literature.

Adversity is a part of educational life for students, teachers, and principals. An individual's response to adversity is determined by personal characteristics and environmental setting. These responses can be measured and altered. If educational leaders realize that they do not respond to adversity in the most effective way, improvements can be made that will help not only the individual but also the institution as a whole. Principals, through the development of personal resilient behaviors and attitudes coupled with the development and implementation of resilient environment setting, can increase personal and professional response to adversity and thereby student achievement.

The focus of this research was to examine the influence principal response to adversity has on student achievement and teacher response to adversity. Chapter 3 discusses the methodology and design used to collect data using the ARP instrument and principal interviews to answer the questions first posed in Chapter 1.

## CHAPTER 3

### Research Design & Methodology

#### Theoretical Framework and Design

This research focused on the relationship between a principal's response to educational adversity and its impact on student achievement. The researcher implemented an ex post facto non-experimental research design, which was characterized by careful description of observable phenomenon and the exploration of possible relationships. Description is central to non-experimental research design (Leedy, 1997). According to Leedy, descriptive researchers tend to convert their data into numerical indices and employ statistical analysis techniques to reveal findings. Descriptive designs are used to examine a specific situation or phenomenon as it is occurs, without any attempt to manipulate variables in the situation. Thus, the framework of this dissertation describes and explores the relationship between a principal's response to adversity and student achievement. In the words of Leedy (1997), non-experimental research is an attempt to

...look beyond the fact; to observe, to go beyond the observation. Look at the world of men and women, and you are overwhelmed by what you see. Select from that mass of humanity a well chosen few, and observe with insight, and they will tell you more than all the multitudes together. This is the way we must learn: by sampling judiciously, by looking intently with the inward eye. Then, from these few you behold, tell us what you see to be true. (p. 189)



The type of non-experimental research used for this study is ex post facto. This type of design describes relationships that have occurred in the past. The intent of ex post facto design is the uncovering of possible cause and effect relationships among previously observed phenomenon (Leedy, 1997).

Ex post facto design allows the researcher to examine how a specific independent variable (principal's response to adversity) affects the dependent variables (student achievement and teacher response to adversity). It is not possible, or ethical, for the researcher to manipulate the variables in all situations. Because true experimentation is not possible, the researcher looks at conditions that have already occurred or are occurring, collects data, and investigates the relationships of the varying conditions on behavior. Like experimental designs, ex post facto research seeks to determine cause-and-effect relationships and to compare groups on dependant variables. The intent of this research is to determine cause-and-effect relationships that have occurred in the past. As such, the generalizability of the research findings outside its specific setting is limited. Additionally, the establishment of one causal link does not preclude the existence of another. Numerous variables outside the researcher's control, such as attitudes, previous experiences, or education, may have influenced the results. The research findings of this study were specific to the unique situations, events, and setting in which they occurred.

#### Research questions

The research question was divided into three parts with two-associated hypotheses. The first question asked, what is the relationship between a principal's response to adversity and student achievement as measured by standardized tests. From this questions the following hypothesis asserts: Hypothesis (1) Students in a school with a

higher Adversity Quotient (AQ) principal will have higher standardized test scores than students in a school with a lower AQ principal, and Null Hypotheses (1) There is no difference in student achievement as measured by standardized test scores between schools based on principal AQ.

The second question asked, what was the relationship between a principal's response to adversity and the respective teachers' response to adversity. From this question, the following hypothesis asserts: Hypothesis (2) Principal response to adversity (AQ) will be positively correlated with teacher response to adversity (AQ), and Null Hypothesis (2) Principal response to adversity (AQ) will not correlate to teacher response to adversity (AQ).

In addition to the above stated quantitative hypotheses, this study searched for further understanding through qualitative endeavors. Thus, one additional research question was forwarded, what are principals' perceptions of their ability to handle educational adversity.

#### Location

The research site was the Flagstaff Unified School District (FUSD), located in Flagstaff, Arizona. Flagstaff is the largest community in Northern Arizona, and is the home of Northern Arizona University (NAU). Flagstaff has a population of between 50,000-60,000 residents, including NAU students. Flagstaff has a mix of Anglo, Hispanic, Black, Asian, and Native America residents, and is adjacent to the largest Indian reservation in America, the Navajo Nation.

FUSD had three high schools, two middle schools and eleven elementary schools. Based on the October 2001 census report, FUSD had 11,621 students. The ethnic

composition of the FUSD was 57% white, 2% black, 17% Hispanic, 23% Native American, and 1% Asian during the 2001-2002 school year. The ethnic composition varies greatly within specific schools.

### Participants

Participants in this study included all 17 of the district's principals and 79 of the district's 859 teachers. Participants were selected by availability and willingness to volunteer. Thus, the sample was a sample of convenience. Teachers in nine schools volunteered to participate in this study. All principals and teachers willing to participate in this study were asked to complete the Adversity Response Profile (ARP) questionnaire. Additionally, five principals who completed the ARP were interviewed.

Fourteen of the schools participating in this research are of the traditional one principal per school configuration, however, two schools had unique configurations. One magnet elementary school has co-principals. Additionally, one of the secondary schools has an additional magnet school located on its campus; there is one principal for these two schools. All three of these principals participated in this research. In an effort to control outside variables, such as parent choice, and to aid in the manageability of this study, private schools, charter schools, and schools with specific enrollment criteria were omitted from this study.

No participant received remuneration of any type for his or her participation in this study. All participants signed an informed consent release. The researcher lived in Flagstaff and was employed by FUSD, thus providing the accessibility to the schools. The researcher conducted the interviews and administered the ARP instrument.

The names and locations of individual schools were omitted from this published work. The researcher coded schools and participants so that data may be related to schools and principals without personal information being revealed, thus ensuring anonymity and confidentiality. The results of this research were made available to the FUSD upon request.

### Measures

The data of this research consisted of primary data collected through interviews and questionnaires and secondary data taken from published standardized test scores. The primary data were composed of principal and teacher responses to the ARP, as well as, five principal responses to five interview questions. The secondary data were the yearly AIMS and SAT 9 standardized tests administered by the district.

#### *Adversity Response Profile*

The ARP questionnaire was used to measure individual response to adversity. This is a self-report questionnaire consisting of 60 questions to 30 scenarios with a five point Lickert scale response (Stoltz, 1997). This questionnaire was developed, tested, and validated by Peak Learning with over 7,500 participants from diverse organizations such as Kaibab National Forest, W. L. Gore & Associates (makers of Gore-Tex), Minnesota Power, ADC Telecommunications, and US West. A copy of this instrument is located in Appendix A.

A numerical score calculated from respondent's answers is referred to as a person's Adversity Quotient (AQ) (Stoltz, 1997). AQ is a composite of the four sub-sections, CORE. These four sub-sections are *Control*, *Ownership*, *Reach*, and *Effect*. C is the control one has over a given situation. O is the origin and/or ownership of the

situation. R is a measure of reach that a particular event has into other areas of life. E is the measure of endurance, which assesses length of time any given adversity will last. A resulting numerical score, called Adversity Quotient (AQ), is given to each respondent based upon reported answers. Scores are also generated for each of the four sub-components. These four scales are intercorrelated, but also stand on their own as separate measures within AQ. Scores can range from 10-50 on the four sub-scales and can range from 40 to 200 in AQ. The higher the overall score, the more effective an individual is in response to adverse conditions.

According to Gay (1992), the most important quality of any standardized instrument is validity. Validity is defined by Best and Kahn (1998) as “that quality of a data-gathering instrument or procedure that enables it to measure what it is suppose to measure” (p. 276). According to Stoltz (1997), the Adversity Response Profile has been completed by more than 7,500 people around the world of varying ages, races, cultures, and occupations. “Formal analysis of the results reveals that the instrument is a valid measure of how people respond to adversity and a powerful predictor of success” (p. 88).

Validity consists of two components, congruent validity and discriminate validity. Congruent validity is when a questionnaire or survey measures what it is designed, intended, and used to measure. Discriminate validity is the degree to which an instrument measures skills, traits, or knowledge other than the ones it is intended to measure. A validity study was conducted for the ARP on a sample of 124 account managers. Supervisors were asked to rate each account manager’s productivity on a four point scale (four being an excellent producer who is consistently near the top of his/her group, three being a good producer who performs well and has long term potential, two being an

individual who has difficulty meeting goals and though may exhibit potential has difficulty demonstrating drive and discipline necessary to succeed, and one being an individual who rarely meets goals and has a problem attitude and work ethic). The results of this scale were correlated with the ARP. All correlations were found to be positive and statistically significant. According to Stoltz (2000), this study finds evidence for congruent validity of the ARP, and suggests that AQ may be a valid indicator of successful job performance.

Reliability refers to “the degree of consistency that the instrument or procedure demonstrates” (Best and Kahn, 1998, p. 276). According to Stoltz (1997), the ARP has proven to be highly reliable in that “Professionals, students, executives, and athletes who have complete the tool more than once over a number of months, without participating in the AQ training program, demonstrate strong consistency in their results” (p. 88). In using the ARP, internal consistency may refer to the consistency of answers to all questions within a scale, or it may refer to the consistency of answers at two different points in time when no change in AQ has occurred during the time interval. Reliability coefficients may range from zero to one, with zero meaning that the answers to the questions are unrelated to one another, usually because they measure different traits. A coefficient of one indicates that all answers are perfectly intercorrelated, a condition that occurs if all questions were identical or nearly identical. Generally, a test is considered to have “good” reliability if its reliability coefficient is greater than 0.8, and a subscore of 0.7 would be considered high. When tested, the AQ score and all four subscores were found to have high reliabilities. Stoltz (1999) using the Cronbach’s coefficient found the following values for reliability: control = 0.77, ownership = 0.78, reach = 0.83, endurance

= 0.86, and AQ = 0.86. A detailed analysis of validity and reliability indices for the ARP are in Appendix B.

The ARP questionnaire was administered to all building principals and participating teachers. Participants were asked to complete this questionnaire under the supervision of the researcher. Only completed questionnaires were used. The researcher was present to help assure proper and valid completion of questionnaires. Once completed, the questionnaires were coded to insure anonymity in publication of results.

#### *Interviews*

Five principals were interviewed regarding perceptions of their ability to manage educational adversity. These interviews were used to verify quantitative results and add a richer, thicker description of principal response to adversity. This additional qualitative data contributes to triangulation, which increases the validity of the conclusions. The interviews were conducted after the ARP questionnaire had been administered and coded.

#### *Standardized test data*

Like most school districts, FUSD administers and publishes standardized test scores on a yearly basis. This school district uses two types of standardized tests, Stanford-9 (SAT 9) and Arizona Instrument to Measure Standards (AIMS). This research will use both the SAT 9 scores and the AIM scores from the most recent years, 2001 and 2002. These tests were discussed in detail in Chapter 1 (see the State of Arizona, Department of Education Website for more information on the utilization of these tests within the state).

## Procedures

Data collection occurred in three phases. The first phase was the collection of the Adversity Response Profile (ARP) from the principals. Phase two was the interviewing of five principals to obtain qualitative data on principals' response to adversity, and phase three was the collection of the ARP from volunteer teachers.

During phase one, the ARP was administered to all 17 school principals by the researcher during the summer of 2002. The researcher explained the purpose of the research and obtained a signed *Consent to Participate in Research* form from each principal. The ARP was administered to principals at their respective schools. The researcher was present during the completion of each ARP. During this initial data collection, the principals were made aware that the researcher would contact schools for additional data, teacher response to the ARP and principal interviews. Upon completion of the principals' ARP, the researcher scored the surveys and the data was entered into an Excel spreadsheet to arrive at an Adversity Quotient (AQ).

In phase two, the researcher contacted several principals in early fall of 2002 and requested an interview. Five interviews (one high school principal, one middle school principal, and three elementary school principals) were conducted based on availability, convenience, and willingness to participate. The researcher met with each principal separately at their respective schools and tape-recorded the interviews. Five leading questions were used with follow-up questions as merited by principals' responses. The five leading questions were: (1) how would you define adversity within education, (2) what specific adversities have affected this institution, (3) what techniques have you used to try to either increase resiliency or diminish adversity, (4) how does adversity affect



student achievement, and (5) do you have any closing comments on adversity in education.

The final phase of data collection was conducted during the fall of the 2002-2003 school year. Teachers from nine schools volunteered to take the ARP. The teachers were informed of the intent of the research and a signed *Consent to Participate in Research* form was obtained from each participating teacher. The researcher administered the ARP to the teachers at the nine schools throughout the fall of 2002 at mutually agreed upon times and locations. Availability and willingness to participate in research were the determining factors in the selection of teachers from these nine schools.

#### Data analysis

Principal's AQ scores (independent variable) were correlated with building SAT 9 and AIM test scores (dependant variable) using Pearson's correlation to examine the possible relationship. Upon scoring the questionnaire, the principals' scores were divided into groups based on their AQ scores. Analysis of variance (ANOVA) and t-Test statistical measures were used to check for significant difference between the averages of the principals' AQ by groups and their respective students' standardized test scores.

The AQ of the teachers was also generated. ANOVA was used on the averaged scores of teachers in the nine different building to see if a significant difference exists. Additionally, for those nine sites where both principals and teachers participated in this research, a t-Test was used on the averaged teacher's scores and the principal's score to see if a significant difference exists. Principle's AQ scores (independent variable) were correlated with the building averaged teacher's AQ scores (dependant variable) using Pearson's correlation to examine the possible relationship.

T-Test and Wilcoxon were used to determine if there was a difference on the average scores of one or more variables between two groups that were independent of each other. In this research study, the two independent groups were the principals and the teachers of their respective schools. The variable being analyzed was their AQ score. A t-Test was used to analysis the means between principals' AQ score and teachers' AQ scores.

Pearson's correlation examines the degree to which one variable influences another. The researcher investigated for possible correlations between principals' AQ scores and teachers' AQ scores, as well as, the possible correlations between principals' AQ scores and respective student achievement scores.

A simple analysis of variance (ANOVA) is a test used to determine significant differences between two or more means. ANOVA was used to examine the difference between groupings of principals based on AQ score, building level averaged teacher AQ, and building level standardized test scores.

The insight gained from the principal interviews was dissected by themes and question response. This information was related to the relevant findings from both the literature review and the quantitative data. Much of the knowledge revealed in Chapter 2 on the principal's role as educational leader, with the struggles of adversity response, climate creation and maintenance, and increased student achievement, was echoed in these interviews.

The researcher presents the results of the study after systematically analyzing and synthesizing all the data gathered through interviews and questionnaires. The results include patterns, relationships, correlations, consistencies and inconsistencies. The data

also reveals personal interpretations, observations, judgments, assertion, insights, and intuitions.

#### Limitations of study

Trochim (1982) maintains that much of social research examines, “whether a program, treatment or manipulation causes some outcome or result” (p. 1). A focus of this research was to establish that those principals with high AQ do, in fact, influence increased student achievement and/or increased teacher AQ. To establish a cause-and-effect relationship, Cook and Campbell (1979) argue that three conditions must be met: covariation, temporal precedence, and no plausible alternative explanation. Covariation is the assumption that a change in cause is in fact related to a change in effect. A significant difference between student test scores based on high and low principal AQ scores will establish covariation. However, because this study uses an ex post facto research design, causality can only be suggested.

Temporal precedence presumes that the cause occurred prior to the effect. All of the principals in this study have been at their locations for a minimum of one year prior to the administration of the standardized testing. Thirteen of the 17 principals have been at their respective locations for three years or more.

No plausible alternative explanation presumes that the only reasonable explanation for the outcome in the dependant variable is the effect of the independent variable. Of the three, the third condition is the most difficult to meet. The variables that affect student achievement are numerous. The conditions, climate, demographics, and staff of each school are unique. This was non-experimental ex post facto research using

human subjects. It did not attempt to manipulate variables, but rather identify possible pre-existing cause and effect relationships.

The focus of this research was to show a relationship between principal AQ and student achievement. To achieve this end, the ARP was used, an instrument developed expressly to determine adversity response. If such a relationship was shown to exist, using statistical measures and anecdotal interview information, it establishes the importance of adversity response on student achievement. This specific aspect of school culture will likely influence student outcomes, for as argued by Peterson and Deal (1998), principals are key to building positive school culture. It is a positive school culture (which is influenced by adversity response) that gives meaning and importance to instructional activity and provides a symbolic bridge between action and results (Meyer & Rowan, 1983).

The scope of this non-experimental research did not allow for the exclusion of all other possible variables that influence student achievement, given the time, circumstances, and unique setting of each school. It is not the hope of the researcher to establish that AQ is the only probable variable that influences student achievement, but rather a new and previously unmeasured variable that affects such.

Related to above-mentioned limitations is the issue of bias. Although bias is inherent in all research, non-experimental descriptive research is more easily influenced because it is difficult for the researcher to detect. "Data in descriptive survey research are particularly susceptible to distortion through the introduction of bias into the research design. Particular attention should be given, therefore, to safeguarding the data from the influence of bias" (Leedy, 1997, p. 218-219). Leedy defines bias as "any influence,

condition, or set of conditions that singularly or together distort the data from what may have been obtained under conditions of pure chance” (Leedy, 1997, p. 219). Bias, though frequently minute and imperceptible, attacks the integrity of the observations and the data. However, awareness is a first step in limiting the impact of bias. The researcher acknowledges that by virtue of topic selection, the researcher is looking for relationships to support the hypotheses.

A major limitation of this study was the unknown variables that influence the manner in which teachers and principals respond to adversity. In Chapter 2, the factors relating to individual resiliency and adversity were discussed in detail. Basic worldview, which incorporates attitudes and beliefs about how individuals interact with others and the world at large, is one example of an uncontrollable variable. Additionally, the factors influencing each group may differ according to each group’s perception. For example, this study did not attempt to address the differing manners with which teachers and principals perceive, define, and resolve adversity.

An additional limitation of this study was its non-random design. A source of invalidity was the researcher’s inability to control the multiplicity of variables that influence school climate and student achievement. There is more to school culture than the manner in which principals and teachers handle adversity. An example of such variables is the interpersonal relationship between principal and students, as well as between teachers and students.

Adversity affects all individuals and the ARP is the only known standardized instrument that measures an individual’s ability to respond to adverse conditions, either as general state or as a specific situation. The development and early use of the ARP

occurred primarily within the entrepreneurial business world. The business world and the world of education do overlap and intertwine, and there are similar leadership characteristics required for both. Adversity response is an important element for all leaders, however there may exist differences in the manner with which business leaders and educational leaders respond to adversity. A limitation to this study may be its use of an instrument developed outside of an educational context.

This research was specific to the location and circumstances found by the researcher during the 2001-2002 school year. As all communities and school districts are unique, and this research is qualitative non-experimental in nature, there are limitations to generalizing the findings of this research to other locales and times. The researcher chose the location for this study by its availability and access. The events that occurred during the school year were unique, and the researcher had no control over their occurrence.

### Conclusion

Although the specifics of the adversity that occurs within varying schools districts may differ, it is the belief of the researcher that how leaders handle adversity is generalizable. It is in real world experiences that leaders must exercise their responses to adversity. Through careful and thoughtful analysis, the researcher uncovered the shared responses of leaders who have positively dealt with adversity.

Chapter 4 will present the results of this study and the degree to which the principal response to adversity influences both student achievement and teacher response to adversity. The underlying impetus for this study is to aid students in academic endeavors. The knowledge gained from this research will help educational leaders determine the role and impact adversity may play in student achievement. If the results

support the hypothesis, the means currently exist to aid principals and others in education in a more positive and productive management of educational adversity. If, on the other hand, the results do not support the hypothesis, this information may still prove useful in eliminating extraneous variables from future investigation. Regardless of the statistical results, the interviews add a wealth of knowledge about principal perceptions of adversity in education and the overcoming or management of such.





## CHAPTER 4

### Quantitative and Qualitative Analysis

This research posed three main questions: (1) What is the relationship between a principal's response to adversity and student achievement as measured by standardized tests, (2) What is the relationship between a principal's response to adversity and the classroom teacher's response to adversity, and (3) What are principals' perceptions of their ability to effectively deal with adversity.

This chapter examined the data collected to answer these questions and was divided into three main sections: data collection procedures, quantitative analysis, and qualitative analysis. The first section reviews the data collection procedures to provide descriptive statistics of the sample in this study. The quantitative data section was divided into two parts, primary data analysis and secondary data analysis, and examined the quantitative data collected from the ARP questionnaires and the published standardized test results used to test the first two hypotheses. These hypotheses state:

Hypothesis (1): Students in a school with a higher Adversity Quotient (AQ) principal will have higher standardized test scores than students in a school with a lower AQ principal.

Null Hypotheses (1): There is no difference in student achievement as measured by standardized test scores between schools based on principal AQ.

Hypotheses (2): Principal response to adversity (AQ) will be positively correlated with teacher response to adversity (AQ).

Null Hypotheses (2): Principal response to adversity (AQ) will not correlate to teacher response to adversity (AQ).

Section three examined the qualitative data obtained from interviews regarding principals' perceptions of educational adversity, adversity's impact on school climate and student achievement, and their ability to handle adversity. As a form of triangulation, this additional information will add support to the conclusions drawn from the quantitative data.

#### Data Collection Procedures

The researcher received signed permission to conduct data collection from the superintendent of the Flagstaff Unified School District (FUSD) in April of 2002 and Cardinal Stritch University's IRB granted permission to conduct human research in May of 2002. The researcher collected data in three phases during the summer and early fall of 2002. The first phase was the collection of the Adversity Response Profile (ARP) from the principals. Phase two was the interviewing of five principals to obtain additional evidence regarding principals' response to adversity. Phase three was the collection of the ARP from volunteer teachers.

During phase one, the ARP was administered to all 17 school principals within the district. As stated in Chapter 3, to control for variables and to limit the scope of this study to a more manageable level, principals of non-traditional schools or schools with specific enrollment criteria were omitted. The researcher explained the purpose of the research and obtained a signed *Consent to Participate in Research* form from each principal. The ARP was administered to principals at their respective schools. The researcher was present during the completion of each ARP. During this initial data

collection, the principals were made aware that the researcher would contact schools for additional data, teacher response to the ARP, and principal interviews. Upon completion of the principals ARP, the surveys were scored and the data was entered into an Excel spreadsheet to arrive at an Adversity Quotient (AQ) (Stoltz, 1997).

In phase two, the researcher contacted several principals and requested an interview. Five interviews were conducted based on availability and convenience.

The final phase of data collection was conducted during the fall of the 2002-2003 school year. The researcher asked school principals for volunteer teachers from within their respective buildings that would be willing to participate in this research. Teachers from nine schools volunteered. The teachers were informed of the intent of the research and a signed *Consent to Participate in Research* form was obtained from each participating teacher. The researcher administered the ARP to the teachers at the nine schools throughout the fall of 2002 at mutually agreed upon times and locations. The data were scored, and an AQ was determined for each teacher. Availability and willingness to participate in research were the determining factors in the selection of these nine schools.

#### *Descriptive Statistics*

Seventy-nine teachers from nine schools and 17 principals from 16 schools participated in this study by taking and completing the ARP. One teacher survey was only partially completed and thus was omitted from this study. Before taking the ARP, participants were asked to give their age, ethnicity, and years in education. Teachers were additionally asked their current position, and administrators were asked their years in administration. Fourteen teachers elected not to reveal some or all of the demographic data requested. One principal elected not to reveal his/her age.

### *Demographics*

The mean age for teachers was 42.4, (SD = 10.25), while the mean age for principals was 49.5, (SD = 6.5). The mean years in education for all respondents were 15.6, (SD = 8.19). The mean years in education for principals were significantly higher, 22.7, (SD = 6.15), with a range of 10 years to 32 years. The mean years in education for teachers were 14, (SD = 7.77), with a range of one year to 35 years. The principal's mean for years in administration was 12.3, (SD = 6.79), with a range of two years to 22 years. Of the participants reporting their gender, the breakout between principals and teachers is as follows: 59% of the principals were male while only 22% of the teachers were male, 41% of the principals were female and 78% of the teachers were female.

Sixty-seven teachers and all 17 principals reported their ethnicity. Thirteen of the principals were Anglo, three were Hispanic, and one was Native American. Sixty-one teachers were Anglo, four were Hispanic, one was Asian, and one was Mixed.

### *Adversity Response*

The Adversity Response Profile is a scenario based survey instrument that measures an individual's response to adversity including four sub-components represented by the letters C, O, R, and E. C is the perceived *control* one has over a given situation. O is the *origin* and/or *ownership* of the adverse event or situation. R is a measure of *reach* that a particular event has into other areas of life. E is the measure of *endurance*, which assesses length of time a respondent believes any given adversity will last. A resulting numerical score called Adversity Quotient (AQ) was given to each respondent based upon reported answers. Scores are also generated for each of the four sub-components.

Table 1 shows the mean AQ and CORE data generated for the principals. The AQ score is a composite of the four sub scores. The relevance of these scores indicates an individual's response to adverse situations as presented in the questionnaire. Higher scores indicate a more successful adaptational response. The mean AQ score for principals was 130.65 within a range of 113 to 160. As Stoltz (2000) notes, "AQ is the precise, measurable, unconscious pattern of how you respond to adversity" (p. 23). It should be noted that the AQ scores in this research were lower than those previously obtained using this instrument with other samples. This is due, in part, to a rewording of the instrument by the copyright holder.

*Table 1*

*Principal AQ and CORE Data*

|         | <u>Yrs in</u><br><u>Admin</u> | <u>C</u><br><u>value</u> | <u>O</u><br><u>value</u> | <u>R</u><br><u>value</u> | <u>E</u><br><u>value</u> | <u>AQ</u><br><u>Score</u> |
|---------|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|
| Mean    | 12.29                         | 31.47                    | 33.82                    | 35.53                    | 29.82                    | 130.65                    |
| STD     | 6.80                          | 3.78                     | 2.35                     | 6.94                     | 5.25                     | 13.51                     |
| Minimum | 2.00                          | 24.00                    | 29.00                    | 24.00                    | 22.00                    | 113.00                    |
| Maximum | 22.00                         | 38.00                    | 38.00                    | 45.00                    | 42.00                    | 160.00                    |

Note. n = 17

Table 2 is a comparison of AQ data between principals and teachers indicates a similar level of overall average adversity response. The principals mean AQ score was 130.65, and the teachers mean AQ score was 132.41. The difference between the principal and teacher means was not significant ( $t = 0.61$ ,  $p = 0.27$ ).

Table 2

*Summary Comparison of AQ Data Between Principals and Teachers*

|         | Teachers | Principals |
|---------|----------|------------|
| Mean    | 132.41   | 130.65     |
| S. D.   | 10.17    | 13.51      |
| Minimum | 110      | 113        |
| Maximum | 155      | 160        |
| Note.   | n=79     | n=17       |

*Student Achievement*

Student achievement was measured via standardized tests regularly administered by the district. The standardized test information was gathered from the district office of the Flagstaff Unified School District (FUSD). Both the SAT 9, a norm referenced test, and AIMS, a criterion referenced test, are administered on a yearly basis. Neighborhood school scores and district scores are available to the public. Generally, only selected grades from the district and schools were published in the local newspaper. For convenience, the same grades selected for newspaper publication were used in this research. The SAT 9 scores used in this research were the Partial Battery scores taken from grades three, six, eight, and nine for the school years ending 2001 and 2002. The AIMS scores used in the research were the averaged reading, math, and language scores per grade taken from grades three, five, eight, and ten for the school year ending 2002.

The SAT 9 test currently used by FUSD was normed in 1995. Two years of data were collected to broaden the scope of student achievement scores and minimize the possibility of a one-year spike in data being unrepresentative of student achievement. The AIMS test, still relatively new and experimental, was recalibrated in 2001. Only the most recent data were used, 2002.

Schools are coded to correspond with principals, for example, school A corresponds to principal A, the exception being co-principals N and O for school N. Thus, there is no school O. The scores of co-principals N and O were averaged to represent school N. See Appendix C for tables showing the SAT 9 standardized test scores for 2001 and 2002 and the AIMS standardized test scores for 2002.

There was a very high correlation for all students between 2001 and 2002 SAT 9 scores ( $r = .87$ ). The correlation for all students between AIMS scores and SAT 9 scores is also high (2001 SAT 9 and 2002 AIMS,  $r = .81$ , and 2002 SAT 9 and AIMS,  $r = .78$ ). The importance of these correlations lies in the consistency with which students at each school scored on standardized tests.

#### Primary Quantitative Analysis

Quantitative measures were used to investigate the relationship between student achievement scores, teachers' AQ scores, and principals' AQ scores. In further analysis, elementary schools and principals were analyzed separately from secondary schools and principals. For elementary schools, student standardized test scores were obtained for two separate grades within each elementary school. These scores were averaged to provide a more representative look at student achievement within the building. For secondary schools, student standardized test scores were obtained for only one grade.

These measures were also used to examine the relationship between principal AQ and teacher AQ, and between teacher AQ and student achievement scores. Analysis and conclusions are provided in the following sections.

### *Hypothesis One Data*

Hypothesis one states: Students in a school with a higher Adversity Quotient (AQ) principal will have higher standardized test scores than students in a school with a lower AQ principal.

Pearson's Correlation Coefficient was used to examine the strength of the relationship between principal AQ and student achievement. The correlations that exist between all principals and all schools, and between elementary principals and elementary schools are weak. A very weak positive relationship exists for all schools between the SAT 9 scores for the school years 2001, 2002, and principal AQ,  $r = 0.171$  and  $r = 0.112$ . Within the elementary schools, one moderate strong positive relationship exists between principals AQ and the third grade SAT 9 scores from 2001,  $r = 0.412$ . Two very weak positive relationships are evident for the 2002 third grade SAT 9 and 2002 third grade AIMS,  $r = 0.132$  and  $r = 0.161$ . Though very weak, these correlations do not preclude a possible influential relationship.

Table 3 displays the relationship between principal AQ and the five secondary schools. The information provided in Table 3 establishes a very strong relationship between principal AQ and student achievement at the secondary level. The correlation is strongest between principal AQ and SAT 9 for the 2001 school year ( $r = 0.897$ ,  $t = 0.039$ ).



Table 3

*Correlation Between Students' Achievement Scores and Principals' AQ for the Secondary Schools for the Years 2001 and 2002*

| School                                | Principal AQ | SAT 9 '01 | SAT 9 '02 | AIMS '02 |
|---------------------------------------|--------------|-----------|-----------|----------|
| School A                              | 113          | 48        | 47        | 54       |
| School I                              | 128          | 56        | 61        | 50       |
| School M                              | 136          | 54        | 61        | 58       |
| School P                              | 153          | 57        | 56        | 62       |
| School R                              | 160          | 65        | 64        | 51       |
| Notes. Correlation Coefficients n = 5 |              | r = .897  | r = .672  | r = .252 |

To further clarify this relationship, differences between student achievement scores were examined based on their relationship to high and low AQ principals. Paul Stoltz in *Adversity Quotient @ Work* (2000, p. 48-49) divides AQ scores into five groups: high AQ, moderately high AQ, moderate AQ, moderately low AQ, and low AQ. As mentioned earlier in this chapter, the APR instrument has been reworded by Stoltz, and because of such, the AQ scores in this research are lower than those previously obtained with this instrument for other samples. Adjustments (grouping parameter scores were modified) were made to the grouping criteria as defined by Stoltz in *Adversity Quotient @ Work*. The AQ scores obtained in this study were placed into the new groupings without alteration as follows: high AQ (161-200), moderately high AQ (144-160), moderate AQ (118-143), moderately low AQ (103-117), and low AQ (102 and below). Three principal's AQ scores placed them in the moderately high AQ group, and three principals AQ scores placed them in the moderately low AQ group. No principal scored in the highest or lowest AQ grouping. The majority of principals scored in the moderate AQ group, which is consistent with the descriptive statistics.

The scores from the three standardized tests used in this study (SAT 9 2001, SAT 2002, and AIMS 2002) were merged. Although variations between specific tests may reveal interesting information, the intent of this research views standardized tests as a general measure of student achievement. The data from all three tests were merged and used to represent student achievement. A schools' data from more than one test may be present if that school consistently scored low in more than one student achievement test. Viewing the three standardized test scores of each school as three separate entities and merging the data provides for a larger sample size, which increases the validity of the statistical measures. The principal AQ scores were similarly merged to provide a larger sample size with increased statistical validity.

A comparison was made between the student achievement scores of schools whose principals placed in the moderately high AQ group with the student achievement scores of schools whose principals placed in the moderately low AQ group. A significant difference existed in student achievement between students at schools with moderately high AQ principals and students at schools with moderately low AQ principals ( $t = -3.35$ ,  $p = .01$ , Wilcoxon  $p = .009$ ). Comparing moderately high AQ principals with moderately low AQ principals, establishes that principal response to adversity is an influencing factor in student achievement.

In reversing this procedure, an analysis was made of principals' AQ scores when schools were ranked by student achievement. Analysis revealed that higher scoring AQ principals have higher scoring student achievement, when compared with lower scoring AQ principals. Further, the data also revealed that schools with higher student achievement scores have principals with higher AQ scores, when compared with schools

that have lower student achievement scores. A significant difference ( $t = -2.80$  with  $p = .026$ , and a Wilcoxon  $p = .014$ ) was found to exist between the AQ scores of principals at higher student achievement schools versus lower student achievement schools.

#### *Hypothesis One Conclusions*

A strong correlation exists between test scores and principal AQ at the secondary education level. The correlations found to exist between all schools and all principals and between elementary schools and elementary principals did not preclude the existence of an influential relationship. Pearson's Correlation does not establish causality, however, it does show the relationship between dependant (student achievement) and independent (principal AQ) variables.

Causality was more firmly established through the additional analysis, which indicated a significant difference in student achievement between higher AQ principal schools and lower AQ principal schools. The higher achieving students, as measured by standardized tests, tend to have higher AQ principals, and likewise higher AQ principals have higher achieving students, when measured by standardized tests. Thus, the effectiveness with which principals deal with adversity appears to have an impact on student achievement.

The principal's response to adversity may have a measurable affect on student achievement. A preponderance of the statistical evidence leads the researcher to reject the null for hypothesis one: students in a school with a high AQ principal will have higher standardized test scores than students in a school with a low AQ principal.

*Hypothesis Two Data*

Hypotheses two states: principal response to adversity (AQ) will be positively correlated with teacher response to adversity (AQ).

Table 4 shows the correlation between principal AQ and the averaged teacher AQ for a given school. Teachers in nine schools volunteered to participate in this study. The following table indicates a strong negative relationship exists between principal AQ and teachers AQ ( $r = -0.574$ ), though not at a significant level ( $t = -1.86$ ,  $p = 0.10$ ).

*Table 4*

*Correlation Between Principals' AQ and Averaged Teachers' AQ*

| School   | Principal AQ | Averaged teacher AQ | # of Teachers |
|----------|--------------|---------------------|---------------|
| School B | 114          | 138                 | 9             |
| School D | 118          | 133                 | 10            |
| School G | 125          | 132                 | 6             |
| School I | 128          | 136                 | 13            |
| School J | 131          | 128                 | 10            |
| School K | 133          | 133                 | 6             |
| School N | 144          | 136                 | 6             |
| School P | 153          | 131                 | 11            |
| School R | 160          | 127                 | 8             |

$r = -0.574$

Not all schools with their respective teachers and principal were represented in the above table; rather, only those schools where both principal and teachers volunteered to participate in this study. One plausible explanation for the negative relationship found in Table 4 lies in the perceived adversarial relationship between teachers and principals under the instructional leadership model, as mentioned in Chapter 2. Under this model, principals make decisions about class size, the expenditure of allocated funds, performance evaluation based in part on student achievement, and the direction and vision of the school. Teacher perception of control is related to their ability to have

influence in matters that concern the classroom, its operation, and teacher evaluation criteria.

This correlation also indicated the possibility that a compensatory relationship may exist between principals and teachers. In other words, the inability on the part of the principal to effectively manage adversity may require teachers to compensate in that area, and vice versa.

### *Hypothesis Two Conclusions*

The evidence relative to hypothesis two is clear. Table 4 shows that a negative correlation exists between principals and those teachers that participated in this study. Thus, the evidence failed to reject the Null for hypothesis two. Principal's AQ scores negatively correlate with teacher AQ scores. Further analysis of teacher and principals AQ data are presented in the next section.

### *Secondary Quantitative Analysis*

This section is a further analysis of the data to reveal meaningful and useful information about adversity response and the role it plays in student achievement. Investigation was made into the relationships between principal and teacher AQ and CORE data, the relationships between principals by gender and ethnicity, the relationships between elementary and secondary principals, the relationships between teacher AQ and student achievement, and the relationships between principal AQ and student achievement.

### *Teacher AQ and Student Achievement*

In further analysis, teacher AQ was correlated with student achievement scores from the nine schools for which this information was available. The results of this

correlation were unexpected by the researcher. A moderately weak negative relationship existed between teachers' AQ and SAT 9 student achievement scores (2001,  $r = -0.457$ , and 2002,  $r = -0.400$ ). The results of the correlation between the AIMS test and teacher AQ were neutral ( $r = .08$ ). The results suggest that teacher response to adversity may have had a negative effect on student performance as measured by standardized tests.

One possible explanation for these results could lie in the perceived lack of control teachers have over their work environment. According to this study, teachers perceive that they have significantly less control over adversity than do principals. This perceived lack of control could result in apathy or an increased feeling of helplessness over events and situations that influence classroom performance. There may also be differences between the manner with which veteran and novice teachers respond to adversity. Veteran teachers may tend to be aware of how to “work” the system, whereas novice teachers may tend to be “overwhelmed” by the system.

Another factor that may help explain the negative relationship between teacher AQ and student achievement is perceived influence. Principal influence is felt school wide. What the principal believes and values is disseminated throughout the entire school, whereas teacher influence is usually delegated to the individual classroom. Further investigation into teacher AQ and student achievement is merited and will be discussed in Chapter 5 under recommendations for further study.

#### *Principal and Teacher AQ and CORE Data*

In analyzing teacher and principal AQ and CORE scores, only slight variance was found and there existed no statistically significant differences. Teachers scored higher both in mean AQ score and in individual CORE scores with the exception of Control.

Principals scored higher on Control than did teachers, though not at a significant level. The difference between principal and teacher Control scores supports the findings mentioned earlier in this chapter. Both principals and teachers had high correlations between their respective AQ scores and their individual CORE scores, (which reflects the internal validity of the instrument) with one exception. The one exception was teacher AQ and teacher control (C),  $r = -0.044$ .

The negative correlation found to exist between principal AQ and teacher AQ as shown in Table 4, may well be reflective of the lack of Control teachers' perceive they have over their work environment under a high AQ principal. These data support the findings of prior research reported in Chapter 2; namely, that teacher self-efficacy was influenced by perceived teacher control. The lack of control perceived by teachers, due to the instructional leadership model, call for reform, and continued increased pressure of student achievement may also explain the negative correlation between teacher AQ and student achievement.

#### *Principal AQ Data*

Although a very weak negative correlation, an interesting and surprising relationship was found between years in administration and AQ scores for principals,  $r = -0.141$ . This indicates a possible "wearing down" of adversity response over the years as principals meet the challenges and struggles inherent in modern education. As would be anticipated, there is a strong correlation between years in education and years in administration,  $r = 0.77$ , as well as, between age and years in administration,  $r = 0.81$ . This suggests that longer time in service provides greater possibility for advancement.

The majority of principals in FUSD are of non-minority ethnicity (13 of 17). In comparing the four minority principals with the 13 non-minority principals there were no significant or meaningful differences. The mean minority AQ score (130.25) was less than one point below that of the mean non-minority AQ score (130.77), which was not a significant difference. CORE scores also indicated no substantial differences.

A significant difference in principal AQ between genders was found. The three highest AQ scores were female. Women (7 of 17 principals) scored higher in all four of the CORE areas as well as AQ scores. The mean AQ score for men was 125.9 as compared to a mean of 137.4 for women. The difference in these means was significant ( $t = 1.860, p = .04$ ). Additionally, three of the five secondary principals are female. The two highest scoring principals on the ARP were secondary female principals.

Men and women are different emotionally (Goleman, 1995), and as such, tend to respond differently to adversity (Stoltz, 1997). The differences that were found to exist between AQ scores by gender may well be reflective of the differences with which men and women manage emotion and understand its value in relationship management. Women tend to be more adept at these tasks, whereas men view this task as less important.

#### *Further Analysis of Principal AQ and Student Achievement*

Principals' ARP scores were divided into three groups, moderately high AQ, moderate AQ, and moderately low AQ. The principals' AQ range was 113 to 160. ANOVA was used to identify differences in the student achievement scores between the three principal groups. Statistically significant differences existed between these groups in student achievement tests, (ANOVA  $f = 10.46, p = 0.000$ ). In post hoc analysis, no



significant difference was found to exist in student achievement scores between schools with moderate AQ principals and schools with moderately high AQ principals ( $t = 1.42, p = .16$ ). However, a significant difference was found to exist in student achievement scores between schools with moderately low AQ principals and schools with moderate AQ principals ( $t = -4.27, p = 0.0002$ ).

The data analysis presented earlier in this chapter revealed a significant difference in student achievement scores between moderately high AQ principals and moderately low AQ principals. The data revealed that students at schools with both moderate and moderately high AQ principals achieve equally well on standardized tests. These findings suggest a possible threshold at which student achievement as measured by standardized tests was diminished. That threshold for diminished student achievement comes at the moderately low AQ level. The implications from these findings are further articulated in Chapter 5.

Dividing the data by principals' AQ score into moderately high, moderate, and moderately low groupings showed significant differences and suggest a threshold at which student achievement was diminished. In further analyzing the data, student achievement scores were divided into quartiles based on principal AQ with equally significant results. A significant difference existed between test scores when analyzed by quartile. What is surprising is that it is the second quartile that consistently outperforms the other three in mean student achievement scores. Additionally, significant differences exist between quartile one and the remaining three as shown in Table 5, (\* represents a  $p < .01$ ). This further supports the notion of a threshold level of principal AQ at which student achievement was diminished.

Table 5

*Analysis of Student Achievement Means by Quartiles*

|            | Quartile 1 | Quartile 2 | Quartile 3 | Quartile 4 |
|------------|------------|------------|------------|------------|
| Quartile 1 | 1.000      | 0.000*     | 0.015*     | 0.012*     |
| Quartile 2 |            | 1.000      | 0.000*     | 0.000*     |
| Quartile 3 |            |            | 1.000      | 0.909      |
| Quartile 4 |            |            |            | 1.000      |

\* =  $p < 0.01$

One important difference in the make up of these quartiles is that the second quartile is the only all elementary school quartile. At least one secondary school is present in each other quartile. The elementary schools have a higher mean student achievement score than do the secondary schools (64.2 vs. 56.2), and it is significant ( $t = 2.25, p = .014$ ).

*Conclusion to Quantitative Data*

This section of Chapter 4 analyzed the quantitative data collected to answer two of the research questions and their related hypotheses on principal adversity response and its influence. The correlations between principal AQ and student achievement suggest variable influence, from very strong correlations between secondary schools and principal AQ to weak or non-existence correlations between elementary schools and principal AQ.

The most conclusive evidence of the influence principals' response to adversity has on student achievement is in the difference between moderately high AQ principal schools and moderately low AQ principal schools. The overall consistency with which students at schools with moderately high AQ principals outperformed students at schools with moderate low AQ principals was both statistically significant and meaningful.

The secondary quantitative analysis corroborated these findings, and suggests a threshold level at which student achievement is positively influenced by principal AQ. There was no significant difference in student achievement between moderate and moderately high AQ principal schools. Differences in student achievement performance occurred at the moderately low AQ level. Further, the secondary quantitative analysis also revealed significant differences between gender responses to adversity, and between principal and teacher response to adversity.

The relationship between principal AQ and student achievement is complex. The following section of qualitative data adds the additional insight of five principals, and their perspectives on the role adversity plays in student achievement.

#### Qualitative Data Analysis

Perceptions influence how an individual internalizes and reacts to situations. Perceived control over events and situations determines individual response. How principals perceive adversity will influence the manner in which they respond to it. The purpose of this qualitative analysis was to investigate principal perceptions of adversity, its affect on student achievement, and their manner of response. Subsequently, these findings were related to those of the Literature Review and the quantitative analysis.

Five principals were interviewed about their perceptions of adversity in education and its impact on student achievement. These principals are identified as: F, G, L, P and R. Their AQ scores ranged from 117 to 160. Of the five principals interviewed, three were male and two were female. Three individuals were principals at elementary schools and two were secondary principals. All five principals had been administrators for at least five years and at more than one location. The interviews took place at each principal's

individual school during the early fall of the 2002-2003 school year. Principal interview selection was based on availability and willingness to participate in this study.

The interviewer asked five questions relating to adversity. Additionally, the interviewer asked each participant for a short biography to help establish the background and experience of each principal. The backgrounds and schools of these five principals were unique, as were their responses, however several themes emerged. A summary of the principals' responses to the interview questions is provided below.

All five principals were eager to discuss their ideas and thoughts on adversity and the role it plays in education. The interviewees related their interpretations of educational adversity, its affect on student achievement, school climate and teacher effectiveness, and finally methods of minimizing the impact of adversity on students and faculty. There was consensus that adversity plays a significant role in education, though the specifics were unique for each principal. Several of the themes that emerged from the interviews correspond well with the data provided in the literature review: perceived control or lack thereof, learned optimism and hardiness, communication, approachability, openness, vision, collaboration, and building a sense of community.

*Question One: How Would You Define Adversity Within Education?*

The first question attempted to obtain a principals' working definition of adversity and the manner in which principals felt adversity affects schools. Though principals identified specific situations, there were also concerns equally shared by all the principals.

Adversity can take many forms, but central to all five respondents was the effect adversity has on students. Unfortunately, principals are often unable to change what they

perceive as the underlying causes of many of the adversities affecting education. A dramatic example given by principal P was the death of two students by suicide two years ago, the effect of which was still felt this year among high school seniors and faculty. Principal P stated, “(Adversity is) anything that impacts a large number of people in the building: student, faculty, staff or all the above...an example would be a suicide.” Much of what affects education and student achievement was perceived by principals as beyond their control or immediate influence.

The concern over perceived control was echoed in the comments of the following Principal (L) who stated, “I really believe that our greatest adversity is our philosophical pride.” Concern over perceived control is reinforced by the statement of Principal R, “To me the biggest adversity is our society today ... adversity is something that blocks what you believe is the best thing to do (for kids).” Principal L stated that adversity in education occurred, “When we in this business (education) do things that aren’t carefully thought out ... and put it into action as a philosophy that works” (F). Principal F was alluding to many of the earlier reform initiatives that have come and gone within education, such as open classrooms and “new math.”

Principal L summarized the importance of beliefs, attitudes and perceived control in education when he stated, “We develop the mindset of whom we are, what we are going to do and how we are going to do it, and then that becomes us. So, anytime there is educational reform ...if it is not within our philosophy, we have the habit of going back to the way we had always done things. So, I really believe that our greatest adversity is our philosophical pride.”

Adversity was also often specific and manageable as evidenced in the comments by Principals G, F, and R: “Adversities are unexpected challenges in regard to managing the interest of and working with, people... a problem or challenge” (Principal G), “I would say adversity in some people’s minds, not necessarily mine, is testing” (Principal F) responded, “So, adversity could be a group of parents that are confronting you about something that you want to implement” (R).

In summarizing, the five interviewed principals expressed belief that adversity was both general and specific and that it could be person-specific or context-specific. Additionally, adversity can range from the micro level (specific school) to the macro level (an entire school district or nation).

*Question Two: What specific adversities have affected this institution?*

This question attempted to see how principals view the specific challenges and struggles that occur on a day-to-day basis in modern education. Budgetary concerns and the impact of 301 (merit pay) were common themes. Principals were concerned about their faculties being overworked, unappreciated for a job well done under adverse conditions, and the impact monetary concerns have on morale and programs that help students. Additionally, principals are concerned about the public's perceptions of teachers, high stakes testing, and education in general.

Principal P stated, “Well, being familiar with 301 goals has been a source of stress. I think obviously not having achieved an academic goal, for whatever reason we didn’t achieve it, could have the potential for impacting student achievement later in the sense that teachers were down about it or it could have the opposite effect... it could motivate them to do better and make sure the students achieve better.” As related by

Principal R, “I think 301 has (had an adverse effect), but my staff made their goals to be sure they could reach them. So, in that way, 301 has worked against itself...I think there is a lot of concern over test scores. We’ve done really well, but I do think teachers feel that pressure.” Principal F said, “301, that’s important. Do you really want to do this because of 301 money or because it the best for kids? They’ve excelled here long before 301, so that’s not an incentive. 301 is a symptom. If we were to compensate people in this society for their worth, teachers would be at the top of the list.”

The impact of recent attempts to increase educational accountability through testing and 301 teacher merit pay was best summed up in the following words of Principal G

Probably the greatest adversity that I’m trying to deal with this year would be the policy changes in the Department of Education and legislation that supports that policy change; I guess the political stress placed on schools. The high stakes test and the results of those tests are an example, Sat 9 and AIMS. If your school isn’t doing well, the moral of the building is diminished by virtue of low-test scores. It puts teachers at risk in terms of their own perceptions of their own success...When your boss and the constituency you serve says your not reaching the level of expectation we expected you to reach, in term of morale not just in the school, but district wide, that’s probably one of the big adversities.

Principals were aware that what impacts teachers, affects school climate. Loss of prep time or a popular teacher “would impact everyone...it’s always a set back” (Principal P). Change in educational leadership, teachers, funding, and philosophical or legislative direction cause uncertainty and increased adversity in the workplace.

Principals must respond to ongoing change from student behavior to loss of funding to loss of faculty, but it was always apparent that principals take their responsibility seriously and do all that is possible to put “children first” (Principal F). “The adversity translates into their (teacher and student) morale” (Principal G).

*Question Three: What techniques have you used to try to either increase resiliency or diminish adversity?*

Adversity is a fact of modern education, how do principals deal with it?

Communication was the overwhelming manner given by the principals to help offset or manage adversity. There was an attempt on the part of all the interviewed principals to build a sense of community or togetherness along with a common vision. Respect for a job well done and establishing an honest trusting relationship with faculty were also emphasized. As one principal suggested, educators need to determine “...what’s the REAL problem” (Principal G).

“Well, the key in terms of a real tragedy...when we have two suicides within three weeks of each other, the main thing there was communication and support and making sure that in times of adversity that teachers were supported, had a chance to voice their opinions. I think its communication and support in times of adversity”, stated (Principal P).

Effective communication and approachability are vital in leadership and adversity response. Principal F stated, “The doors open, if you have something you want to talk to me about, come right on in here.” Similarly, “First of all, bottom line is, I have an open door policy. I strongly believe that people need to have access to me. We sit down and hold a dialogue; we talk”(Principal L) and “A lot of communication...the teachers know



I'm on their side when I morally, ethically, and professionally agree with them.

Communication is probably the biggest thing to do to address any problem, as well as morale" (Principal G).

Trust and the assurance of a job well done are elements used by principals in addressing adversity, "First of all, I've tried to earn trust, not demand it, and not mandate it because of my position... I want them to know that everything runs and operates in this school because of them (the teachers). Everything begins and ends with them, not with me" (Principal F). Principal R stated, "I think first of all, I really try to look for things that teachers are doing well. I wake up in the middle of the night and think I gotta tell ... they did a great job in class", and Principal G stated, "By reassuring my faculty that they are doing an exemplary job...continuing the share the mission of the school, and that they're meeting that mission."

The importance of creating a collaborative team was stated by principal L as, "We've got to all be a part of the solution and we've got to create that environment." Principal F argued that, "Educators are really very slow. We keep putting things on the pile, but we don't take anything off it. People keep doing the same thing over and over and expect different results. So let's focus on the things that we can change...what do we want to change and how do we want to change it? How well are we modeling the very things you're espousing? We need to do that." The importance of a supportive environment is further illustrated in the words of principal R, "Some of the mistakes they (teachers) make are big. But part of my job is to lessen the bigness of it, and let them go back and teach and think ...."

The principals interviewed in this study used several techniques to aid them in combating adversity. The most powerful tool reported by principals was communication. Communication was used to congratulate and correct, to build trust and assurance, and to build a common vision and a collaborative team. Through communication, principals expressed their values and ideas of what was important, which was the well-being and success of both students and teachers.

*Question Four: How Does Adversity Affect Student Achievement?*

The responses to this question were diverse. No principals maintained or asserted that adversity did not affect student achievement, yet there was little consensus on how adversity affects student achievement or its degree. The responses varied from very philosophical and personal introspection to isolated events and external variables. Principals hold both themselves and teachers responsible for providing an appropriate climate for student success.

In an example of a specific event (student suicide) that influenced student achievement school wide, Principal P stated, “In the case of a serious tragedy such as a suicide, or the death of a student, I think that it really does impact student achievement. I think that you have a large portion of your students dwelling on the issue, thinking about the issue. There was a noticeable change in school climate. The impact is still going on. It still has serious impact among the staff.”

Time also can be an adversity as expressed by principal F, “The most important thing is teachers. You have the right teachers but students are only in school 9% of the time...there is only so much we can do. The unstructured school day is as important in

many ways as is the structured school day” and Principal L asserted, “...there is no quick fix to anything because we’re dealing with human lives.”

Perception is vital in addressing the issue of adversity and student achievement. In answering the question of how adversity affects student achievement, Principal R stated, “...I think it’s the school climate, and teacher attitude. Attitude is everything. If a teacher walks in and believes my students will learn, they will.” Principal G maintained that, “Bottom line is you establish reasonable, reachable goals that have been identified as an interest on the part of the community, political interest, and you pursue it. It was professional pride that spurred them (teachers) on to meet the interest established collectively and individually.”

Adversity affects students, in part, as a reflection of the impact adversity has on school culture. Identification of an event or situation as adversity was important in enabling principals to address the adversity’s influence. Adversities are not all equally identifiable, which required principals to ascertain the various factors influencing school culture and their relative importance.

*Question Five: Do You Have Any Closing Comments on Adversity in Education?*

This was intentionally a more open-ended question than the previous four. Several of the principles used this opportunity to address issues important to them but overlooked in the previous questioning. The strongest theme was the manner in which adversity affects all in the educational setting. There was a passionate desire on the part of most principals to express their concerns about the challenges and struggles in current education. Concern was expressed about class size, job security, the role of education nationally, pay, status in society, funding, and the lack of male teachers in the lower

grades. One of the most poignant statements referred to individual perceptions. Fear can be a powerful adversity, fear of the unknown, fear of what may lie ahead “just the thought of them, the fear of them can affect student achievement” (P). In closing this section, the only minority principal interviewed summed up the thoughts of many regarding education and its struggle with accountability:

People are afraid of accountability. Our system is failing kids when you look at it philosophically. I think where the accountability piece comes in is that we want to sit there and blame the parents because the parents aren't being good parents. We want to blame the kids because the kids aren't doing the work at the level that he or she should be doing the work. We want to blame the superintendent because he wants us to create these goals and be held accountable for these kids. So instead of looking and identifying what the learning barriers are, and developing strategies to meet those learning barriers, we have found it easier to point the blame. What we need to do is internalize the fact that we are responsible for this child's education, whether the child has socks on or not, whether the child comes from a broken up home or not. (Principal L)

#### *Conclusion to Qualitative Analysis*

The purpose of this study was to analyze the relationship between principal response to adversity and student achievement. The qualitative portion of this study analyzed principals' perceptions about adversity, its effect on student achievement, and their response to adversity. Through interviews, the principals shared their experiences and thoughts regarding adversity in education.

Adversity can be a specific event, as in a student suicide, or it can be a general condition, as in the call for educational reform. Adversity affects school climate and teacher effectiveness. Principals often see their role as managers of stress and ambiguity and seek to either deflect and redirect adversity, or confront and resolve adversity.

The qualitative data in this study reinforces the findings and assertions of the Literature Review in Chapter 2. Principals influence school culture and student achievement through communication, and the values, attitudes, beliefs, and expectations they express as important (Goldman, 1998; Stolp; 1994, Beckman & Davis, 1990). Further, in agreement with Bossert, et al. (1982) and Purkey & Smith (1983), principals perceive their role, in part, as caretakers of the faculty and staff, student expectations, shared vision, and the collaborative educational learning community that develops at their building.

The role of the principal as leader and caretaker may explain the greater degree of control principals perceive they have over their workplace. This coincides with the quantitative data and literature review on differences in perceived control between principals and teachers (Chamley, Caprio, & Young, 1994). Teacher effectiveness is influenced by perceived control and as such, the negative correlations between teacher AQ and student achievement may be reflective of the diminished control teachers perceive they have over events and situations in the workplace (Chauvin, 1992; Bandura, 1995). The adversity caused by the reduction in force (RIF) of the past school year and increase pressure for accountability brought about by the 301 legislation may also be a factor in perceived loss of control.

In support of the research of Fyans & Maehr (1990), Meyer & Rowan (1983), and Deal (1987), the qualitative analysis in this study concluded that school climate as a reflection of attitudes, norms, beliefs, and expectations influences and was influenced by the principal and faculty. Further, this study suggested that principals influenced school culture by establishing trust, risk taking, open communication, and a collaborative work settings which in turn influenced student achievement, as well as, teacher morale and expectations.

### Conclusion

Chapter 4 contains the data collected to answer the two stated hypotheses, and it offered the insight of five principals on adversity in education. The researcher has accepted hypothesis one: (1) Students in a school with a higher Adversity Quotient (AQ) principal will have higher standardized test scores than students in a school with a lower AQ principal, and rejected hypothesis two: (2) Principal response to adversity (AQ) will be positively correlated with teacher response to adversity (AQ). Chapter 5 provides a synthesis of all the data collected for this study, and draws conclusions based on the provided evidence. It also suggests the need for further investigation into the role adversity plays in education, and suggestions to help principals and teacher more effectively respond to adversity.

## CHAPTER 5

The purpose of this study was to investigate the role adversity plays in modern education, with a specific look at the relationship and influence between principal's response to adversity and student achievement. This chapter is divided into four sections: summary, conclusions, implications, and recommendations. The first section, summary, briefly outlines the purpose of this research and its methodology. Section two, conclusions, ties together the data analysis of Chapter Four with the literature review and the current knowledge base. The third section, implications, addresses the use of the results from this study for education. It contains both pragmatic and philosophical arguments for educational reform. The final section, recommendations, urges the further study of adversity in education with specific suggestions for research.

### Summary

This study analyzed three specific areas of principal response to adversity: the relationship between principal response to adversity and student achievement as measured by standardized test scores, the relationship between principal response to adversity and teacher response to adversity, and finally, principals' perceptions of educational adversity and its impact on school climate and student achievement. The two hypotheses related to the research questions were: (1) Students in a school with a higher Adversity Quotient (AQ) principal will have higher standardized test scores than students in a school with a lower AQ principal, and (2) Principal response to adversity (AQ) will be positively correlated with teacher response to adversity (AQ).

In this Ex-Post Facto non-experimental research, the Adversity Response Profile (ARP) was administered to 96 educators in the Flagstaff Unified School District, and was used to arrive at their Adversity Quotient (AQ). The AQ score is a composite of four sub-scores: *control, ownership, reach, and endurance* (CORE). Principal and teacher AQ scores were analyzed using quantitative measures and correlated with student achievement scores. Principal scores were subsequently divided into three groups, moderately high, moderate, and moderately low. These principal AQ groupings were further analyzed for differences between and within principal groupings based on AQ scores and student achievement scores. The qualitative data obtained from five principal interviews was analyzed for emerging and congruent themes about the role adversity plays in education, student achievement, and school climate.

### Conclusions

The broader purpose of this study was to explore the impact adversity has on student achievement. In refining this intent, three questions were posed with two related hypotheses, as stated in the opening paragraph. This section will provide a synopsis of the quantitative and qualitative analysis and their relationship to the literature review.

### *Relationship to the Data*

The results of this research study support the concept that principal adversity response (AQ) may be an important factor in student success as determined by standardized test scores. The first hypothesis states: students in a school with a higher Adversity Quotient (AQ) principal will have higher standardized test scores than students in a school with a lower AQ principal. The research findings support hypothesis one. There was a statistically significant, strong correlation between student achievement and



principal AQ scores at the secondary level ( $r = 0.897$ ,  $t = 0.039$ ). The correlation between principal AQ and student achievement weakens at the elementary level, but does not disappear completely. These data indicates the possibility of an influential relationship between principal adversity response and student achievement that strengthens as students progress through school.

These results are further supported by the analysis between student achievement scores and principals' AQ scores by grouping (moderately high, moderate, and moderately low). The resulting analysis revealed significant differences in student achievement between the three groups of principals. Students of schools with principals in either the moderately high or moderate AQ grouping significantly outperformed students at schools with principals in the moderately lower AQ group in student achievement as measured by standardized tests. Students at schools with moderate or moderately high AQ principals fared equally well on standardized tests. The significant difference occurred when comparing student achievement scores from schools with moderately low AQ principals to that of schools with either moderate or moderately high AQ principals ( $t = -3.35$ ,  $p = .01$ ).

Equally significant was the comparison of principal AQ scores based on student achievement rankings. Student achievement was grouped into three categories: moderately high, moderate, and moderately low. The analysis revealed a statistically significant difference in principal AQ exists between the moderately low student achievement group and moderate or moderately high student achievement groups ( $t = -2.80$ ,  $p = .026$ ). The upper limit of the moderately low principal AQ grouping is 117.

Thus, the point at which principal AQ scores fell below the moderate AQ grouping level (under 118) was also the point at which student achievement was statistically diminished.

These findings were corroborated by the quartile analysis, which showed that the lowest quartile was statistically different from the other three with diminished student achievement scores. The importance of the analysis by quartile was to determine the existence of other significant differences within student achievement or AQ scores, of which none were found.

The additional approaches used to analyze the results provided a more detailed view of the relationship between principal adversity response and student achievement. Principals may influence student achievement through adversity response.

This analysis suggests that the key issue is ensuring that principals make it to the moderate AQ level. At moderate AQ and above there is no indication of significant or meaningful difference in student achievement. The threshold for diminished student performance appears at the moderately low AQ level. These findings are supported by the work of Stoltz (2000) who maintains that AQ predicts performance. Principals influence school climate and student achievement through expression of values, attitudes, and expectations (Hughes, 1995). At lower levels of AQ, there may be an absence of the supportive relationships and self-efficacy necessary for building resiliency within a school culture (Bernard, 1991; Fraser & Richman, 1999).

Hypothesis two states: Principal response to adversity (AQ) will be positively correlated with teacher response to adversity (AQ). The analysis of the data relative to this hypothesis was surprising. The correlation between principal AQ and teacher AQ showed a moderately strong negative correlation ( $r = -.574$ ). Schools with a higher AQ

principal tend to have lower average teacher AQ scores. Two possible explanations for this inverse relationship were discussed in detail in Chapter 4 (instructional leadership model and compensatory principal/teacher relationships). Another reason may lie in a limitation to this study, namely the inability of all teachers to participate in the ARP survey. There may exist differences between those teachers who participated and those who did not, time and availability being two examples. The study failed to reject null hypothesis two; principals AQ does not positively correlate with teacher AQ. Principals do influence teacher adversity response, though not in the manner anticipated. The data and conclusions relative to hypothesis two indicate the need for further research and will be addressed in the recommendations portion of this chapter.

An additional correlation was conducted between student achievement scores and teacher AQ. This analysis was related to the second hypothesis, though in an unstated fashion. It was reasoned by the researcher that if principal AQ influenced student achievement, so was the likelihood that teacher AQ would do likewise, especially when considering that it was the teacher in the classroom instructing students on a daily basis. The correlation between teacher AQ and student achievement was moderately negative for SAT 9 scores (2001,  $r = -0.457$ , and 2002,  $r = -0.400$ ).

The qualitative analysis on principal perceptions regarding their response to adversity revealed a wealth of information. The idea of adversity as an obstacle to education was not a familiar concept among the interviewed principals. However, once addressed, it became readily identifiable. All five interviewed principals agreed that adversity was becoming more prevalent and affected student achievement. A consensus among principals was the lack of control they perceived they had over adverse events and

situations. The principals also expressed concern over their ability to adequately respond to adversity and its causes. Some adversities (loss of teacher prep time or parent concerns) were easier to manage with observably positive results, while others (legislative action on state educational standards or student suicide) were more cumbersome to manage, and often were not perceived to be within the range of principal influence. Three principals expressed concern over societal issues (breakup of the family, poverty, and lack of moral development) they believe influence much of the adversity in current education. Additionally, these three principals expressed the opinion that society expected education to “solve” social issues, for which educators are not trained. All five principals expressed enthusiasm over this study and the helpful knowledge it may reveal upon completion

Though unstated directly, principals may see their role as managers of adversity, challenge, and ambiguity. They perceive themselves as caretakers of faculty, students, and parents, while at the same time building a collaborative learning community through shared vision, beliefs, attitudes, and expectations (Principal G). A sense of frustration was articulated among the principals over the ability of education (as a national system and a local enterprise) to respond adequately and in a timely fashion to the changes inherent in a call for education reform and a modern society.

#### *Relationship to the Literature*

Figure 1 is a graphical representation of the interrelated factors influencing student achievement. This model has been adapted from the Far West Lab Instructional Leadership Model (Bossert, Dwyer, Rowan, & Lee, 1982). Leadership is influenced by community values, norms, and expectations, as well as, individual values, beliefs, and

attitudes. These factors occur within a context, or institutional setting which has its own norms, beliefs, expectations, and manner within which education is conducted.

The literature reviewed suggests a relationship between principal leadership and teacher effectiveness, school climate, and student achievement. These relationships are two-way, interactive, and mutually influential. The focus of this research was the influence of one particular factor, principal adversity response. This model gives graphical expression to the role and position adversity response plays in the educational environment. Namely, adversity response is one of the conduits through which principal leadership is expressed and influences school climate, teacher effectiveness, and ultimately student achievement.

The results of this study support the literature review in finding that principal adversity response may influence school culture and ultimately student achievement. As the expression of a principal's values, attitudes, and expectations influence school culture, that culture may develop a greater degree of resiliency to the events and challenges that occur in education and everyday life (Werner, 1995; Deal, 1996; Horne, 1997). A resilient school culture in turn influences student success (Krovetz & Speck, 1994, 1995).

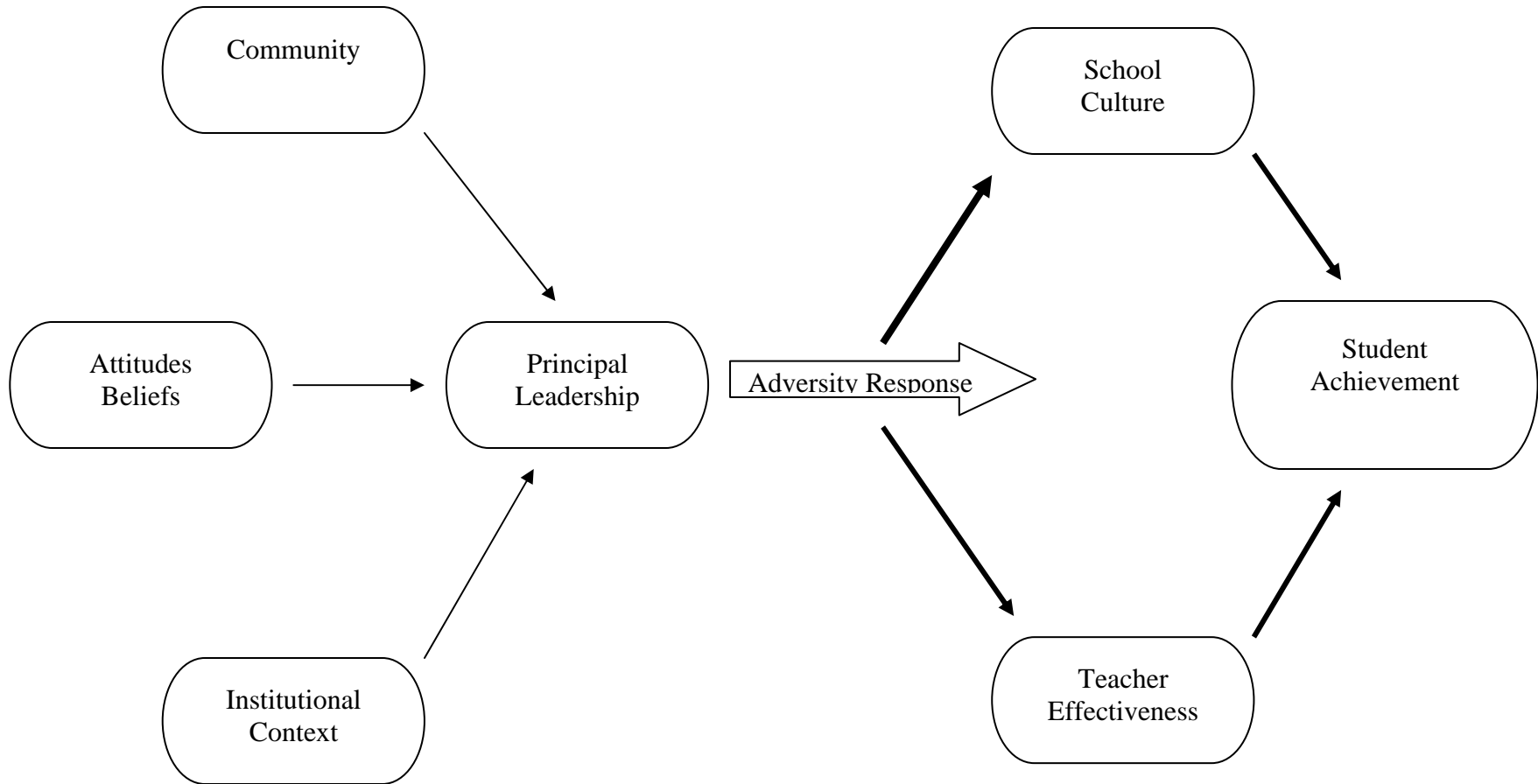


Figure 1.

*Influencing Student Achievement*

Adapted from the Far West Lab Instructional Leadership Model

*The Role of Adversity Response in Student Achievement*

There is a trend toward increased adversity within society and the educational community. Student suicide, increased dropout among minority students, and changes in educational policy at the state and national level are but a few examples of the continuing adversity facing today's educators. Educational leaders face challenging conditions every day in which the results of the decisions made may have long-term effects on the life of a child. There is no greater reason than this to train our nation's educators on how to develop resilient school cultures and foster the traits of high AQ.

Each individual has a unique explanatory style, or pattern of responding to life's events, and as such, this pattern determines an individual's reaction to adversity, manner and degree of influence with others, and all that follows (Weiner, 1986). These explanatory patterns are learned and can be changed and improved. The scientific research on cognitive psychology leads to the conclusion that perception of, and the manner in which individuals respond to adverse situations, is often more important than the adversity itself. The researcher is concurring with Stoltz (2000) who argues that an increased understanding of AQ has a profound role to play in the patterns of thought, emotion, and action that determine who we are as individuals, how we respond to adversity, and the influence we exert. Nowhere is this more important than in the role of principal, because as this study indicates, principal adversity response may be a critical element in student and teacher success.

The factors influencing student success via academic achievement are numerous and interrelated. This study focused on the role principal response to adversity plays in the larger dynamic of student success. The conclusions from this study support the notion

that principal adversity response was an influencing factor in student achievement. There appears to be three possible strands of influence between principal AQ and student achievement: influence through school culture, influence on teacher self-efficacy, and direct person-to-person influence.

The least influential strand appears to be direct influence between principals and students. This assessment was derived from the principal interviews and the literature review. Principals' visibility and interpersonal relationships with students may influence student success. The principal interviews revealed a feeling of direct principal to student relationship and influence. Principal communication and influence occur within a culture. There is significant evidence that school culture influences student achievement, however a difficulty may lie in distinguishing personal principal influence from principal influence through school culture. Much of influence principals have on students may be indirect.

The strongest area of principal influence appears to be in the creation of school culture. The results of this study and the literature review strongly support the idea that principals affect student achievement via school culture (Goldman, 1998; Hughes, 1995). Students at schools with moderate or moderately high AQ principals consistently and significantly outperformed those students at schools with moderately low AQ principals. The principal influences what is held to be important through his/her expression of attitudes, beliefs, expectations, and modeling within the school culture. The measure of a principal's adversity response as determined by AQ sets the tone for both interpersonal interaction and the sphere of principal influence.



School culture can be compared to a computer operating system, because it is the spoken and unspoken code of conduct that determines how things really get done. Culture is the interlocking system of attitudes, beliefs, norms, rules, values, and expectations (implied and expressed) that guide language, behavior, and decisions. Principals determine what others in the organization view as important by the dissemination of culture through communication. High AQ leaders express attitudes and use language that persuades people to ascend to levels they might otherwise never reach (Stoltz, 2000), thereby increasing the resiliency within school culture and positively influencing others toward success. The exchange of symbols or language throughout a workplace environment regarding challenges is particularly important to understanding how that culture operates and its ability to effectively respond to adversity and thereby positively influence student achievement. Principals, as indicated by the results of this study, may affect student achievement and teacher self-efficacy as a determinant of the AQ level of the principal.

The last area of principal influence is teacher self-efficacy, and the results of this study reveal a possibly troubling relationship between principals and teachers. Teacher self-efficacy is related to perceived control over events that affect one's life, the ability to attain desired outcomes, and a belief that one has the necessary skills (Bandura, 1995; Gibson & Dembo, 1984). Additionally, perceived control and self-efficacy are determining factors in establishing trusting professional relationships (da Costa & Riordan, 1996). The teachers in this study perceived they had significantly less control (as measured by AQ) than did the principals, which may have adversely influenced self-efficacy. This finding (lower teacher perceived control) may help explain the negative

correlations that were found to exist between teacher AQ scores and both principal AQ scores and student achievement. The importance of this finding implies the need for principals to increase their awareness of the factors influencing teacher self-efficacy and adversity response in an effort to increase school resiliency, and in due course, student success.

### Implications and Recommendations for Practice

Awareness of adversity and its consequence is the beginning of effective response to it. Through AQ analysis and training, individuals learn to identify the components of adversity, the control they have over it, the ownership or the degree to which a given adversity is the result of their individual action, the effect the adversity has on faculty, students, and school climate, and the reach a given adversity has into other areas of life. Applying the principles of AQ, individuals on average improve their adversity response by 16% (Stoltz, 2000). The results of the present study have shown that AQ may be an influencing factor in student achievement. An increase of only 10% would have placed all the principals in this study at the moderate AQ level or above. Educational leaders need to be aware of adversity response and its impact on school climate; this begins with an understanding of their own adversity response.

Some specific attitudes, perceptions and ideas that can have an immediate impact on school climate and principal adversity response (adapted from Stoltz, 2000) are as follows: (a) provide formal training in educational adversity and AQ through workshops and training sessions; (b) define the vision of the school and each person's role and accountability; (c) once defined, guard the vision because it is about something higher, deeper, and more meaningful, it is our defining purpose; (d) expect the best from yourself

and those around you, set high expectation for yourself and your coworkers, and then work arduously towards its fulfillment; (e) control what you can and let go of what you cannot control; (f) infuse ownership, this is our school and our students, because ownership is about holding true to your values and the values of the culture (regarding accountability) precisely when it is most difficult to do so.

This study, though limited in scope, addresses the importance of adversity response in education. The manner in which an individual perceives an event affects their response to such. Therefore, the findings of this study should be disseminated to educators to raise awareness of the importance of adversity response. Educational institutions can begin to train leaders in effective adversity response (AQ), and thereby assist faculties in developing resilience in the workplace.

College and university education programs should be made aware of the importance of adversity response in school climate creation and student achievement. Leaders at these institutions may well consider redesigning curriculum to reflect the emerging research on adversity response. In order to develop resilient and hardy educational leaders, cognitive psychology research that relates to adversity response should be incorporated into the educational leadership curriculum. The goal would be to fortify educational leaders for the challenges of modern education.

Educational leaders can implement the knowledge gained from research in the areas of school culture and teacher effectiveness to establish an educational climate that encourages risk-taking, collaboration, and the importance of meaning, which in turn will influence student success and student achievement.

Educational institutions may use AQ in hiring practice and provide support through training in AQ. The goal of this practice is to capitalize on the strengths of individuals with high AQ and through supportive training improve the adversity response of individuals with low AQ.

#### Recommendations for Future Research

Future research should be conducted into other areas of the educational population. An example would be AQ of entry-level educators compared with the AQ of seasoned educators. This would help determine variance in adversity response over time and circumstance within an educational setting.

Additional research should be conducted to see if prior exposure to AQ could have affected the results of this study, and to see the effects of time on the adversity response of principals. Has participation in this study increased awareness of educational adversity? Do high AQ principals consistently maintain higher student achievement scores?

Further research should also include interviewing teachers and students to gauge their perceptions of adversity and its impact on the educational climate and student achievement. This future research should investigate teacher adversity response and perceived control over workplace factors. This research would increase understanding of conditions within an educational setting, which allow teachers to perceive more/less control over adversity. Additionally, it would increase awareness of students' perceptions of the educational adversities currently engaged by leaders, teachers, and the community.

The relationship between principal and teacher is crucial to the establishment of a successful school culture. Continued research should be conducted into the relationship

between teacher AQ and principal AQ, as well as the relationship between teacher AQ and student achievement. This research would provide increased understanding of teacher's perceptions of adversity and its affect on the workplace environment. Comparative research at another location may support or refute the findings of this study. This research would further the understanding of the relationships between a classroom teacher's AQ and the student achievement of students under his/her tutelage.

Future research should include the influence district administration have on adversity response. This research would further the understanding of the role of culture in influencing principal, teacher, and student success. This research would aid in understanding the relationship between principal AQ and superintendent AQ. Additionally, it would add insight into the influence the attitudes, beliefs, and perceptions of adversity response as held by district level administrators has on district level student achievement.

An individual's ability to deal successfully with adversity comes from a number of cognitive factors. Research into the relationship between AQ and other cognitive measures, (Myers-Briggs and EQ for example) should be considered. This research could aid in gathering a larger overall picture of the role cognitive abilities, including AQ, play in future training and self-awareness of educators.

Additional research should be conducted to examine the relationships between AQ and school culture. This research would aid in clarifying the influence AQ has on school culture and vice versa. This research could examine the influence cultural AQ has on individual AQ.

There is constant change and adversity in schools today: transition of faculty and staff, introduction of new textbooks, orientation of new students, implementation of new programs, and the continuing calls for increased accountability. The responsibility of the principal is to manage, facilitate, and direct the interests of all of these different and competing elements into a coherent and effective education delivery system (Murnane, 1983). By increasing educators' knowledge and understanding of educational adversity and AQ, school culture, teacher self-efficacy, and student achievement are positively influenced providing increased success.

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APPENDIXES

Appendix A

*Adversity Response Profile: Quick Take*



## Appendix B

### *ARP Reliability and Validity: Adversity Response Profile™ (ARP)*

*Technical Supplement--May 2000*

#### Introduction

The Adversity Response Profile™ (ARP) is a self-rating questionnaire designed to measure an individual's style of responding to adverse situations (Stoltz, 1997). The ARP describes fourteen scenarios, only ten of which are actually scored. Each scenario is followed by four questions, each answered on a 5-point bipolar scale. Each of the four answers is scored on a different scale. There are, therefore, four scales of ten questions each. The sum of the four scores is the person's Adversity Quotient (AQ).

The four scales of AQ are Control, Ownership, Reach, and Endurance. Although these scales may be intercorrelated, they measure very different aspects of AQ.

The Control scale measures the degree of control the person perceives that he or she has over adverse events. Ownership is the extent to which the person owns, or takes responsibility for, the outcomes of adversity or the extent to which the person holds himself or herself accountable for improving the situation. Reach is the degree to which the person perceives good or bad events reaching into other areas of life. Endurance is the perception of time over which good or bad events and their consequences will last or endure.

#### Purpose of This Section

This section serves as a technical supplement to the Adversity Response Profile (ARP). This short document provides information on the statistical and psychometric properties of the ARP, and it attempts to present this information in a manner that is meaningful to corporate managers and organizational leaders. At the end of the report is a summary of terms used in this report -- terminology that may be unfamiliar to the reader. Each of these terms will also be defined as it is introduced in the report.

#### Background

Research on the related subjects of hardiness, resiliency, optimism, locus of control, attribution theory, self-efficacy, and learned helplessness suggest that good health and success in life are largely determined by how one responds to adversity (Abramson, Seligman, & Teasdale, 1978; Hiroto & Seligman, 1975; Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982; Peterson, Maier, & Seligman, 1993; Rotter, 1966; Seligman, 1991; Wortman & Brehm, 1975). This research is derived from the fields of cognitive psychology, health sciences, and neurophysiology. Stoltz (1997) discusses the contributions of research in these fields to the science of AQ and to the development and use of the Adversity Response Profile.

## Norms

AQ scores are presently available from a diverse sample of 2,414 employees and students in 27 different companies and educational institutions nationwide. The distribution of their AQ scores provides norms with which anyone taking the ARP can compare his or her score.

Of the 2,414 respondents, 3% omitted the question on gender, and 15% omitted the question on ethnic identity. Of those who answered the gender question, 41% were female. Of those who answered the ethnicity question, 80% were White non-Hispanic, 5% were Hispanic, 6% were African American, 3% were Asian American, 2% were American Indian, and 4% did not fit into these categories. The average age was 38, and ages ranged from 15 to 77.

Scores on each scale of the ARP can range from 10 to 50, and AQ scores can range from 40 to 200. Table 1 shows the mean, standard deviation, and minimum and maximum scores on each scale and on total AQ.

Table 1.  
Scale Score Statistics (N = 837)

|                    | Scale C | Scale O | Scale R | Scale E | AQ    |
|--------------------|---------|---------|---------|---------|-------|
| Mean               | 37.2    | 41.3    | 37.1    | 34.0    | 149.5 |
| Standard deviation | 5.6     | 5.0     | 6.9     | 6.7     | 15.7  |
| Minimum            | 13      | 24      | 10      | 10      | 96    |
| Maximum            | 50      | 50      | 50      | 50      | 191   |

The percentile rank associated with each AQ score can be found in Table 2. Half of the sample obtained AQ scores under 146. Five percent obtained scores under 122, and 5% obtained scores of 176 or higher. One quarter of the sample scored under 135; one quarter scored 159 or higher.

Individuals can determine their own percentile ranks by looking up their AQ scores and reading off the percentile levels. For example, a person obtaining an AQ score of 153 is in the 66th percentile, meaning that 66% of the people who have taken the ARP have scored below the person scoring 153.

Table 2.  
Percentile Ranks for AQ Scores on the Adversity Response Profile, Version 6.0 (N = 837)

| Score   | %-ile | Score | %-ile | Score | %-ile | Score   | %-ile |
|---------|-------|-------|-------|-------|-------|---------|-------|
| 96-111  | <1    | 135   | 18    | 150   | 54    | 165     | 84    |
| 112-116 | 1     | 136   | 19    | 151   | 56    | 166     | 85    |
| 117-119 | 2     | 137   | 21    | 152   | 59    | 167     | 87    |
| 120     | 3     | 138   | 23    | 153   | 61    | 168     | 88    |
| 121-122 | 4     | 139   | 25    | 154   | 64    | 169     | 89    |
| 123-124 | 5     | 140   | 28    | 155   | 67    | 170     | 90    |
| 125     | 6     | 141   | 31    | 156   | 68    | 171     | 91    |
| 126-127 | 7     | 142   | 33    | 157   | 70    | 172     | 92    |
| 128     | 8     | 143   | 36    | 158   | 72    | 173     | 93    |
| 129     | 9     | 144   | 39    | 159   | 74    | 174     | 94    |
| 130     | 11    | 145   | 42    | 160   | 76    | 175-176 | 95    |
| 131     | 12    | 146   | 44    | 161   | 77    | 177-179 | 96    |
| 132     | 13    | 147   | 47    | 162   | 79    | 180     | 97    |
| 133     | 15    | 148   | 50    | 163   | 81    | 181-184 | 98    |
| 134     | 16    | 149   | 53    | 164   | 82    | 185+    | 99    |

There was only a very small gender difference found for any scale. The mean score on Control was just a point and a half higher for men than for women. The difference (though statistically significant) is too small to be regarded as meaningful. There were no statistically significant ethnic- group differences in scale scores or in total AQ score. See Table 3.

Table 3.  
Gender and Ethnic Comparisons of Scale Scores

| Group                | Number | Mean Score (Standard Deviation) |                |               |               |                 |
|----------------------|--------|---------------------------------|----------------|---------------|---------------|-----------------|
|                      |        | C                               | O              | R             | E             | AQ              |
| Male                 | 363    | 37.2<br>(5.4)                   | 40.9<br>(5.1)  | 37.3<br>(6.9) | 33.5<br>(6.6) | 148.9<br>(16.4) |
| Female               | 455    | 37.2<br>(5.7)                   | 41.7*<br>(4.9) | 36.9<br>(7.0) | 34.3<br>(6.7) | 150.2<br>(15.0) |
| White (non-Hispanic) | 566    | 37.2<br>(5.4)                   | 41.6<br>(4.9)  | 36.9<br>(7.0) | 33.7<br>(6.4) | 149.4<br>(15.7) |
| African American     | 54     | 37.9<br>(6.5)                   | 41.6<br>(4.6)  | 37.6<br>(5.7) | 35.2<br>(7.2) | 152.3<br>(16.4) |
| Hispanic             | 59     | 37.2<br>(6.0)                   | 40.0<br>(5.6)  | 35.8<br>(7.4) | 34.1<br>(7.5) | 147.1<br>(12.4) |
| American Indian      | 16     | **                              | **             | **            | **            | **              |
| Asian American       | 40     | 37.8<br>(6.0)                   | 41.2<br>(5.3)  | 37.9<br>(7.8) | 35.7<br>(8.7) | 152.7<br>(16.5) |
| TOTAL                | 837    | 37.2<br>(5.6)                   | 41.3<br>(5.0)  | 37.1<br>(6.9) | 34.0<br>(6.7) | 149.5<br>(15.7) |

\*  $p < .05$ ; \*\* Statistics are not reported for sample sizes under 20.

### Reliability of the Adversity Response Profile

Reliability has a number of different meanings. Essentially, it refers to the consistency with which something is measured. For the ARP, reliability may refer to internal consistency, that is, the consistency of answers to all questions within a scale, or it may refer to the consistency of answers at two different points in time when no change in AQ has occurred during that time interval. The first of these meanings -- internal consistency -- is most appropriate for estimating the reliability of the ARP because life experiences may cause a person's AQ to rise or fall over time.

Reliability coefficients may range from 0 to 1, where a reliability of 0 means that answers to questions are unrelated to one another (generally because they measure different traits). A reliability of 1 would mean that all answers are perfectly intercorrelated (a condition that would happen if all questions were identical or nearly identical). Realistically, a test is regarded as having "good" reliability if its reliability coefficient is greater than about .8. Subscores, because they are based on fewer numbers of questions, generally have lower reliabilities than do total scores. A subscore reliability greater than about .7 may be regarded as high.

The AQ score and all four subscores were found to have high reliabilities. Table 4 shows Cronbach's coefficient alpha -- a measure of the internal-consistency reliability of each scale score.

Table 4.  
Coefficient Alpha Reliabilities (N = 837)

| Scale     | alpha |
|-----------|-------|
| Control   | .77   |
| Ownership | .78   |
| Reach     | .83   |
| Endurance | .86   |
| AQ        | .86   |

#### Validity of the Adversity Response Profile

Validity has two components. First, a test or questionnaire is said to be valid if it measures what it designed, intended, and used to measure. This is called convergent validity. The second component is called discriminant validity. A test or questionnaire has discriminant validity if does not measure traits, knowledge, or skills other than the ones it is designed to measure. Two different scales on a questionnaire, for example, should measure different things if they have different names. Sometimes the two things that are being measured are related, but they should not be identical, otherwise, there is no justification for having two scales that purport to measure two different things.

Discriminant Validity of the ARP Scale Scores. To justify having four subscores, the intercorrelations among those scores should be less than their corresponding reliabilities (Campbell, 1960; Campbell & Fiske, 1959). Table 5 shows the intercorrelations of ARP scale scores. The highest correlation between scale scores is 0.55 between Control and Ownership. Next highest are 0.43 between Reach and Endurance. The other combinations of scale scores have low intercorrelations. None of the intercorrelations among scale scores is as high as the lowest scale reliability, namely, 0.79. The four scales can be said to have demonstrated good discriminant validity. They measure different, but somewhat related, aspects of AQ.

Table 5.  
Validity Statistics (N = 124)

| Variable            | Mean   | Std Dev | Correlation w/Productivity Rating |
|---------------------|--------|---------|-----------------------------------|
| Control             | 39.25  | 5.14    | .257*                             |
| Ownership           | 43.17  | 4.34    | .242*                             |
| Reach               | 36.42  | 7.12    | .149*                             |
| Endurance           | 36.11  | 6.37    | .085*                             |
| AQ                  | 154.95 | 13.60   | .292**                            |
| Productivity Rating | 3.40   | .99     | 1.00                              |

\*  $p < .01$  \*\*  $p < .001$

**Convergent Validity** of the ARP. Evidence from three validity studies indicates that the ARP is measuring some personal characteristics that relate to job performance and financial success.

Study 1 was conducted on a sample of 124 account managers at a single company. Supervisors were asked to rate the productivity of each account manager on a scale from 1 to 4. Ratings were defined as follows:

- 4 = Excellent producer. May not have the best production figures month in and month out, but is consistently near the top of his or her group.
- 3 = A good producer. Hits goals on a fairly consistent basis. Long-term potential for this individual, based on performance, work ethic and attitude is quite good.
- 2 = Has difficulty meeting performance goals. Occasionally meets goals, but then falters. Has potential, but is not demonstrating the drive and discipline necessary to succeed.
- 1 = Rarely, if ever, hits goals. Attitude and work ethics are a problem.

Table 6 shows correlations between ARP scores and productivity ratings. All correlations are positive and statistically significant, though the correlation between productivity and the Endurance score on the ARP was quite small ( $r = 0.08$ ). The correlation with AQ was 0.29 and may be regarded as an acceptable validity coefficient comparable to the correlations often obtained between academic test scores and college or graduate-school grades (Schneider & Briel, 1990, p. 5). Higher correlations would probably be obtained if there were more specific, well-quantified measures of job performance.

Table 6.  
Intercorrelations of Scale Scores (N = 837)

|                         | C     | O     | R     | E     | AQ   |
|-------------------------|-------|-------|-------|-------|------|
| Control (C)             | 1.00  |       |       |       |      |
| Ownership (O)           | 0.54* | 0.01  |       |       |      |
| Reach (R)               | -.03  | 0.01  | 1.00  |       |      |
| Endurance (E)           | 0.30* | 0.24  | 0.32* | 1.00  |      |
| Adversity Quotient (AQ) | 0.64* | 0.62* | 0.57* | 0.75* | 1.00 |

\*  $p < .001$

This study, completed in one company, finds evidence of convergent validity of the ARP and suggests that AQ may be a valid indicator of successful job performance, preferably used along with other measures.

As more businesses make use of the ARP, more information will be gathered on the validity and reliability of AQ scores. To date, there is evidence that AQ may be a useful predictor of job performance. More studies in the future may indicate which aspects of job performance are best predicted.

A company administering the ARP to more than 100 employees may request that a special validity study be conducted specifically for its employees, and results can be compared to the statistics for the combined sample of companies reported here. Just contact Peak Learning Incorporated to inquire about conducting a study tailored for your business needs.

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#### Terminology Used in This Report

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|                                   |   |
|-----------------------------------|---|
| Adversity Response Profile Terms: |   |
| Adversity Response Profile (ARP)  | A self-rating questionnaire designed to measure an individual's style of responding to adverse situations   |
| Adversity Quotient (AQ)           | The total score obtained on the Adversity Response Profile  |
| Control score                     | A measure of the degree of control a person perceives that he or she has over adverse events; a scale on the Adversity Response Profile and a component of the Adversity Quotient                       |
| Ownership score                   | A measure of the extent to which a person owns, or takes responsibility for, the outcomes of adversity or the extent to which a person holds himself or herself accountable for improving the situation |
| Reach score                       | A measure of the degree to which a person perceives good or bad events reaching into other areas of life  |
| Endurance score                   | A measure of the perception of time over which good or bad events and their consequences will last or endure  |

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**Statistical terms:**

|                    |  |
|--------------------|--|
| Norms              | A distribution of scores obtained by a defined sample of people                                |
| Mean               | The common average obtained by adding up everyone's score and dividing by the number of people |
| Standard deviation | A measure of variation in a distribution of scores   |
| Percentile rank    | The percentage of people scoring at or below a specified score                                 |

**Psychometric terms:**

|                       |   |
|-----------------------|---|
| Reliability           | The consistency with which people give the same answers to questions or to similar questions                            |
| Coefficient alpha     | A measure of internal-consistency reliability ranging from 0 to 1   |
| Validity              | The degree to which a test measures what it purports to measure and does not measure other traits, knowledge, or skills |
| Convergent validity   | Demonstration that a test measures what it is purported to measure  |
| Discriminant validity | Demonstration that a test does not measure traits or knowledge other than what it is purported to measure               |

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## Addendix C

*Additional Data Tables*

Table A

## Principal AQ and CORE Data

|             | Yrs in<br>Admin | Gender | C<br>value | O<br>value | R<br>value | E<br>value | AQ<br>Score |
|-------------|-----------------|--------|------------|------------|------------|------------|-------------|
| Principal A | 20              | M      | 24         | 37         | 27         | 25         | 113         |
| Principal B | 8               | M      | 27         | 33         | 24         | 30         | 114         |
| Principal C | 8               | M      | 32         | 33         | 27         | 25         | 117         |
| Principal D | 9               | F      | 32         | 33         | 28         | 25         | 118         |
| Principal E | 5               | F      | 34         | 35         | 28         | 22         | 119         |
| Principal F | 9               | M      | 30         | 35         | 33         | 27         | 125         |
| Principal G | 21              | M      | 32         | 30         | 32         | 31         | 125         |
| Principal H | 10              | M      | 34         | 29         | 37         | 27         | 127         |
| Principal I | 22              | M      | 30         | 31         | 39         | 28         | 128         |
| Principal J | 22              | F      | 29         | 34         | 40         | 28         | 131         |
| Principal K | 14              | M      | 27         | 36         | 45         | 25         | 133         |
| Principal L | 18              | M      | 29         | 38         | 35         | 32         | 134         |
| Principal M | 13              | F      | 30         | 34         | 38         | 34         | 136         |
| Principal N | 2               | M      | 34         | 33         | 41         | 35         | 143         |
| Principal O | 2               | F      | 36         | 34         | 40         | 35         | 145         |
| Principal P | 18              | F      | 38         | 34         | 45         | 36         | 153         |
| Principal R | 8               | F      | 37         | 36         | 45         | 42         | 160         |

Table B

SAT 9 Scores for the Years 2001 and 2002

| School   | Gr. 3<br>2001 | Gr. 6<br>2001 | Gr. 8<br>2001 | Gr. 9<br>2001 | Gr. 3<br>2002 | Gr. 6<br>2002 | Gr. 8<br>2002 | Gr. 9<br>2002 |
|----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| School A |               |               |               | 48            |               |               |               | 47            |
| School B | 44            | 56            |               |               | 51            | 63            |               |               |
| School C | 41            | 44            |               |               | 27            | 40            |               |               |
| School D | 66            | 63            |               |               | 49            | 54            |               |               |
| School E | 74            | 73            |               |               | 77            | 76            |               |               |
| School F | 73            | 77            |               |               | 75            | 85            |               |               |
| School G | 75            | 81            |               |               | 77            | 81            |               |               |
| School H | 61            | 59            |               |               | 56            | 67            |               |               |
| School I |               |               | 56            |               |               |               | 61            |               |
| School J | 69            | 68            |               |               | 75            | 68            |               |               |
| School K | 53            | 58            |               |               | 47            | 68            |               |               |
| School L | 57            | 53            |               |               | 50            | 55            |               |               |
| School M |               |               |               | 54            |               |               |               | 61            |
| School N | 77            | 57            |               |               | 57            | 54            |               |               |
| School P |               |               |               | 57            |               |               |               | 56            |
| School R |               |               | 65            |               |               |               | 64            |               |

Table C

AIMS Scores for the Year 2002

| School   | Gr. 3 | Gr. 5 | Gr. 8 | Gr.<br>10 |
|----------|-------|-------|-------|-----------|
| School A |       |       |       | 54        |
| School B | 72    | 52    |       |           |
| School C | 48    | 43    |       |           |
| School D | 59    | 66    |       |           |
| School E | 97    | 72    |       |           |
| School F | 93    | 78    |       |           |
| School G | 96    | 92    |       |           |
| School H | 74    | 53    |       |           |
| School I |       |       | 50    |           |
| School J | 82    | 47    |       |           |
| School K | 71    | 53    |       |           |
| School L | 77    | 56    |       |           |
| School M |       |       |       | 58        |
| School N | 74    | 59    |       |           |
| School P |       |       |       | 62        |
| School R |       |       | 51    |           |

Table D

Correlation Between Principals' AQ and Averaged Teachers' AQ.

| School                     | Principal<br>AQ | Averaged teachers<br>AQ |
|----------------------------|-----------------|-------------------------|
| School B                   | 114             | 138                     |
| School D                   | 118             | 133                     |
| School G                   | 125             | 132                     |
| School I                   | 128             | 136                     |
| School J                   | 131             | 128                     |
| School K                   | 133             | 133                     |
| School N                   | 144             | 136                     |
| School P                   | 153             | 131                     |
| School R                   | 160             | 127                     |
| Correlation<br>Coefficient |                 | -0.574                  |

Table E

Correlation Between Mean Teachers' AQ and Student Achievement.

| School                  | Averaged<br>teachers AQ | '01 SAT 9<br>scores | '02 SAT 9<br>scores | '02 AIMS<br>scores |
|-------------------------|-------------------------|---------------------|---------------------|--------------------|
| School R                | 127                     | 65                  | 64                  | 51                 |
| School J                | 128                     | 68.5                | 71.5                | 64.5               |
| School P                | 131                     | 57                  | 56                  | 62.3               |
| School G                | 132                     | 78                  | 79                  | 93.8               |
| School K                | 133                     | 55.5                | 57.5                | 62                 |
| School D                | 133                     | 64.5                | 51.5                | 62.2               |
| School I                | 136                     | 56                  | 61                  | 50                 |
| School N                | 136                     | 67                  | 55.5                | 66.3               |
| School B                | 138                     | 50                  | 57                  | 62                 |
| Correlation Coefficient |                         | -0.457              | -0.400              | 0.038              |