THE RESILIENCE PROCESS IN NOVICE SECONDARY SCIENCE TEACHERS

by

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(Under the Direction of Thomas Koballa)

ABSTRACT

Resilience in novice secondary science teachers is an important and under researched topic. The resilience process serves as a vehicle for understanding why novice secondary science teachers remain in the profession despite exposure to adversities during their initial years of teaching. The goal of this research is to provide insight and a new dimension into the understanding of the resilience process in building resilience in novice secondary science teachers.

To achieve the research goal, a resilience framework was developed. Two factors were instrumental in devising the framework. The first was the research questions, which focused on risk factors and protective factors in the lives of novice secondary science teachers and provided direction and goals for the research. Second, four individual cases were developed around each of the participants in the study and those cases provided exemplars of elements of the resilience process. Through cross case analysis the primary themes of risk and protective factors yielded data to assist in the development of the framework.

The interaction between changing personal and professional risk factors throughout the initial years of teaching and the protective factors that evolved to match those changing risk

factors are central to the development of the resilience framework. The interaction between risk factors and protective factors act as a primary force in the resilience process and stimulate responses to help counteract negative effects of stress. Therefore, resilient individuals develop as a result of exposure to a significant adversity.

The resilience framework illustrates the resilience process and as such can be a useful tool in the development of preservice programs, professional development and mentoring programs as well as the development of school strategies that encourage collaboration and communication among staff members.

INDEX WORDS: Resilience, Resilience process, Resilience framework, Support systems, Risk factors, Protective factors, Novice teachers, Science teachers, Resilient first year science teachers

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DEDICATION

To my loving parents,

siblings,

children

and grandchild

I dedicate this piece of work.

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CHAPTER 1

BACKGROUND OF THE STUDY

Introduction

The first few years teaching represent a particularly vulnerable period in the professional lives of educators. It is a time of personal transition from university student to classroom leader; and it is filled with novelty, challenge, excitement, and frustration. Many schools have instituted mentoring and induction programs for novice teachers to help smooth this transition and to bolster teacher effectiveness (Britton, Raizen, Paine, & Huntley, 2000). Despite the proliferation of these support programs, many novice teachers leave the profession or transfer to another school during their first year in the classroom or soon thereafter (Coble, Smith, & Berry, 2009). These decisions are often prompted by stresses associated with early career teaching. Yet, some novice teachers experience success and enjoyment despite conditions that research suggests would cause them to leave the profession or transfer to another school. These novice teachers exhibit resilience, the strength to understand and thrive in conditions of stress and uncertainty (Richardson, 2002). While teacher attrition and its possible causes have been the focus of much research attention, there is much to be learned about teacher resilience. The study of secondary science teacher resilience is needed, as resilience is associated with teacher retention and effectiveness, as well as student learning and school success (Abbott, 2004).

Statement of the Problem

Teachers encounter many situations that give rise to conflict and stress. Not managed productively, conflict and stress can affect physical health and psychological wellbeing. This may possibly lead to changes in self-esteem, altered patterns of sleeping and eating, depression,

declining job satisfaction, and increased vulnerability to illness (Brooks, 1994). Because of this, conditions associated with teaching make it necessary for all teachers to be resilient. However, there is a lack of empirical research devoted to the understanding of resilience development (Masten, 1994). The work and lives of teachers who have adapted and survived their initial years of teaching is an overlooked area in educational literature (Gu & Day, 2007). The factors that influence resilience must be more effectively identified.

Holling (1973) first introduced the concept of resilience in his research on ecological systems. Moving from a focus on ecological systems to human studies, Frankenburg (1987), argued in favor of focusing on strengths that seem to protect some children who are at high risk for developmental handicaps. This was a change from the historical approach of confining attention to pathology and problems (Grotberg, 1996). Miller's (1986) work with women also focused attention on the importance of relationships in individuals characterized as resilient. Miller's clinical practice with women led her to an understanding of how contextual and relational experiences contribute to the psychological wellbeing of all people (Robb, 2006) and not just those in therapeutics. Following the publication of Miller's seminal work, Relational-Culture Theory (RCT) was conceptualized by Judith Jordan. Jordan (1992) suggested focusing on resilience as a relational dynamic with a movement toward empathic mutuality. Specifically, Jordan suggested that researchers could no longer look within the individual for factors that facilitated adjustment, but rather, they needed to examine the relational dynamic which encouraged the making of connections.

Building on this premise, this study stands in contrast to much research that has been devoted to explore the factors that are associated with teacher failure and attrition, which first identified traits of teachers at risk of leaving within their first five years of teaching. This

research takes the more positive focus of resilience research by identifying factors that may contribute to positive outcomes (Gu & Day 2007).

Purpose and Rationale

The purpose of this study was to investigate the factors that influenced the process of resilience in four novice high school science teachers. This study focuses first on the life-circumstances that novice secondary science teaches find problematic, next on identifying an array of protective factors the novice teachers use in attempting to deal with these problems, and then, examining the linkages between the risk factors encountered by the novice secondary science teachers and their protective factors.

Resilience is characterized by the ability to draw on protective factors. Protective factors are a type of safety net that enables individuals to resist life stressors (Kaplan, Turner, Norman, & Stillson, 1996). Therefore, research was guided by the following questions:

- What are risk factors faced by novice secondary science teachers identified as resilient?
- What protective factors do resilient teachers employ?
- How do risk factors and protective factors facilitate the resilience process?

Although much research has focused on resilience in children, little has focused on factors that develop resilience in novice secondary science teachers and even less on how protective factors change to meet the changing risk factors incurred in secondary science teachers' initial years of teaching. Resilience can enhance teaching effectiveness, heighten career satisfaction and better prepare teachers to adjust to the changing conditions of education (Bobek, 2002; Gu & Day, 2007; Howard & Johnson, 2004) as they use varying degree of their personal,

professional and organizational selves in work role performances. This statement has implications for understanding how and why resilience varies among teachers over time.

Overview of Theoretical Framework

Resilience as a framework is consistent with the perspective that the study of developmental processes under extraordinary conditions can inform our understanding of both typical and atypical development (Linley & Joseph, 2004b). “Prevention scientists and advocates of a positive approach to psychology have touted the resilience framework for its potential to inform efforts to foster positive developmental outcomes among disadvantaged children, families, and communities” (Linley & Joseph, 2004b, p. 521). In this study the framework is based on resilience theory and its close link, relational culture theory.

Resilience Theory

“Resilience theory speaks to the strengths that people and systems demonstrate that enable them to rise above adversity” (VanBreda, 2001, p.1). Resilience theory addresses individuals, families, communities, workplaces and policies. This theory signaled the reduction in emphasis on pathology and an increase in emphasis on strengths (Rak & Patterson, 1996). The change in focus corresponds to that of other research in child development and education (O’Leary, 1998), in which evolving data led researchers away from the notion that resilience was an internal phenomenon, into studying the external factors implicated in the development of resilience (Masten, Best & Garmezy, 1990). VanBreda noted that resilience theory had its roots in the study of children who proved resilient despite adverse childhood environments. McCubbin and McCubbin (1992) likewise noted that both theory and research have advanced in the direction of strengths and capabilities, thus enhancing the capability for intervention. Resilience

is something that promotes compassion, flexibility and the ability to bounce back after an encounter with adversity (Schwartz, 1997).

An important component of resilience is the "presence of protective factors (personal, social, familial, and institutional safety nets)" that enables individuals to resist life stress (Kaplan, Turner, Norman & Stillson, 1996, p.158). To more closely understand the scope of protective factors, one must understand that variables in resilience may function simultaneously as both risk and protective factors. For example, high intelligence may be a protective factor against antisocial behavior (Kendall et al., 1988) and low intelligence can be a risk factor (Moffitt, 1993). The most well-known study on the concept of protective factors is the study conducted by Werner and Smith (1982, 1992) on children from Kauai, Hawaii. "The protective effects of personal and social resources at various ages were examined by comparing these resilient individuals with those exposed to similar risk, who had developed behavioral problems" (Losel & Bender, 2003, p. 136). Those children labeled as resilient exhibited the following protective factors: active, sociable, easy tempered, independent and self-confident. They also developed reliable bonds to persons inside and outside the family, received social support from adults and other caring individuals, had high self–esteem and internal locus of control.

Research does suggest that coping strategies are protective in that they enable an individual to cope with the stressful situation successfully and recover" (Steinhardt & Dolbier, 2008, p. 445). Coping strategies are a piece of protective factors and as such encompass strategies that are task-oriented, emotional-oriented and avoidance-oriented (Mundia, 2010). Pearlin and Schooler (1982) elaborated further on coping strategies. They described the first as responses that change the situation out of which stress arises. The authors suggested that this type as not often used, as people do not always recognize the situation, which is causing the

stress. The second, responses that control the meaning of the stress is the most common type. This mechanism can entail making positive comparisons to reduce the severity of the stressful situation, ignore parts of the situation and concentrate on less stressful aspects of the situation and reduce the relative importance of the risk factor in relation to one's overall life situation. The third, responses that function more for the control of the stress after it has emerged, does not attack the situation itself. The focus involves basic stress management responses such as exercise or involvement in hobbies. A group intervention based on Pearlin and Schooler's (1982) "model of coping and adaptive behavior: attacking the problem, rethinking the problem, and managing the stress" (p. 105) created the links between theory, practice and research thereby increasing support from work sources promoting positive constructive coping skills. In so doing, this further supported the move toward focusing on one's strengths rather than deficits.

Unlike Pearlin and Schooler whose focus was stress management responses, Polk (1997) focused on individual resilience. Polk synthesized four patterns of resilience that promote a resilient disposition towards life stressors. Included in these patterns are self-reliance, positive relationships, the ability to solve problems and the ability to take action in response to a stressful situation. The notion of focusing on the positive and framing resilience as a process was furthered in the research conducted on Relational Cultural Theory.

Relational Culture Theory

Nested within the notion of resilience theory is Relational Culture Theory (RCT). Where resilience theory speaks to the strengths of individuals in overcoming adversity, RCT depicts those strengths as the result of human connections. In conjunction with a large body of research that supports the importance of factors within the individual such as temperament, hardiness and intelligence, there is also research supporting the importance of relationships in the development

of psychological resilience (Jordan, 2006b). Rooted in the works of Jean Baker Miller, RCT posits that individuals grow through and toward human connections that foster mutual support. Growth fostering relationships generate a "sense of zest increasing clarity, productivity/creativity, a sense of worth and desire for more connection" (Jordan, 2006b, p. 4). Like resilience theory, RCT focuses on overcoming adversity, but emphasizes that it is accomplished through the promotion of mutually empowering, growth-fostering connections in the face of adversity (Jordan, 2006b). Jordan emphasizes that promoting relational development helps individuals grow though and beyond experiences of hardship and adversity.

Relational-Cultural theory (RCT) first emerged following Jean Baker Miller's work with women (Comstock et al., 2008). In contrast to the theories of counseling and human development that emphasize individuation, separation, and autonomy as markers of psychological health and emotional maturity, Miller's work suggested that it is the contextual and relational experiences that lead to psychological wellbeing of all people (Comstock et al., 2008). Relational Culture Theory promotes relational resilience as a way to overcome adversity. Tait (2008) suggests, "teachers must form trusting and functional relationships with students, parents, colleagues, and administrators in order to succeed" (p. 60).

Constructivism

Finally, the broader perspective that theoretically informs this study is constructivism. Emphasis in constructivism is placed on the dynamic structure of human experience with the understanding that life and human consciousness is not static, but rather is a continuous process (Mahoney & Granvold, 2005). Much like the process of resilience, constructivism is conveyed in a range of perspectives on human experiences. Mahoney and Granvold note that the constructivist philosophy maintains that humans are active participants in their own lives and as

such, make choices that affect their lives and the lives of all with whom they are connected. Similar to concepts on resilience and Relational Culture Theory, constructivism emphasizes that humans are not passive entities in which life occurs around them. Instead, the individual is an active agent in the process of experiencing. Constructivism assumes an order to life, which when changed, requires repairs. Mahoney and Granvold include distress and disturbance as necessary components to human change much like resilience presupposes adversity and the employment of protective mechanisms to restore order.

A goal of constructivism is the promotion of wellbeing through an individual's continuous expansion of self-conceptualization with the understanding that the sense of self emerges and changes primarily in relationship to others (Mahoney & Granvold, 2005). This view is similar to Judith Jordan's (2004b) assertion that relationships are at the core of resilience and moving an individual from isolation to relatedness is a move toward healthy psychological growth. The focus of constructivism is on strengths, personal resources and human resilience. It is this basis that provides a framework to explain the nature of novice high school teachers' resilience building process and allows the examination of this process from their perspective.

Overview of Methodology

The researcher employed an interpretative case study approach (Merriam, 1991) to investigate how four selected high school science teachers perceived to be resilient to the demands of a complex schooling environment were influenced in their responses to the stresses associated with being a novice teacher. Schwandt (1994) asserts that in using an interpretive approach, one can attain deep insight into "the complex world of lived experience from the point of view of those who live it" (p. 118). Cavana, Delahaye, and Sekaran (2001) further note that interpretive research assumes that reality is socially constructed and the researcher becomes the

vehicle by which the reality is revealed. This approach is consistent with Crotty's (2003) view that the interpretive approach "looks for culturally derived and historically situated interpretations of the social life-world" (p. 67). Minger (2001) adds that this is consistent with the construction of the social world, which is characterized by the interaction between the researcher and the participants.

The four participants chosen for this study had recently completed a secondary science teacher education program at a large state university in the southeastern United States. For this study, participants were selected based on the following: (1) certified as a secondary science teacher by the state education agency; (2) employed full-time at a public high school; (3) completed science-specific teacher preparation program; and (4) and were perceived to demonstrate a high degree of resilience. During methods classes they exhibited self-reliance, problem solving abilities and the ability to take action, qualities noted by Polk (1997) as dispositional patterns towards resilience. During the student teaching experience the researcher observed the participants using coping strategies that were task-oriented and emotional-oriented, qualities noted by Mundia (2010) as indicative of resilient behavior.

For this study the researcher used a multiple-case study design (Chin, 1989), which is aligned with the researcher's intention to treat each of the four resilient teachers and their school context, which the researcher considered to be dynamically intertwined (Kumpfer, 1999), as a separate case study. Moreover, the researcher sought to identify themes that were consistent across the four case studies. All four teachers are female, although gender was not considered a sampling criterion.

Data collection techniques were applied in a manner consistent with the interpretive orientation of the study. Specifically, the researcher used in-depth, semi-structured interviews,

job shadowing, relational mapping and a written prompt to elicit metaphors for personal resilience as the techniques through which to access data over two academic years. Between four and six interviews were conducted with each teacher, and were conversational in nature to allow details of their personal perceptions to surface.

Inductive analysis (Charmaz, 2006) was used in this qualitative research. The first phase consisted of initial coding (Glaser & Strauss, 1967). The initial line-by-line coding was kept open ended to allow ideas to emerge and to identify any gaps in the information. Occasionally, in-vivo codes were used to signify the participants' special terms derived from the context in which they worked or their personal identities. The second phase consisted of Axial coding (Strauss & Corbin, 1990) to synthesize and organize the wide-ranging segments of data accumulated through the initial coding into larger categories. The resulting data were then consolidated into four cases around the emerging themes describing each participant (Merriam, 1998). In the third phase, individual cases were analyzed. General concepts formed by extracting common features within each case were arranged into categories. Cross-case analysis followed to identify similarities and differences and to provide insight into issues concerning resilience in novice secondary science teachers.

Definition of Salient Terms

The following terms used in this study have been defined for purposes of clarity:

In the context of this study, the term *'novice teachers'* refers to those in methods courses, student teaching and five or less years of classroom experience. Novice teachers are those teachers most at risk for leaving the profession. The literature notes that thirty percent of the novice teachers leave within three years and up to fifty percent leave within five years (Darling-Hammond, 1997).

Resilience is the capacity for successful adaptation despite challenging or threatening circumstances (Masten et al., 1990). Tait (2008) defined resilience as a mode of interacting with events in the environment that is activated in times of stress. It is a multidimensional process that allows the individual to successfully adapt to the environment. “Resilience is not an outcome in and of itself. Rather, it is a dynamic developmental process that enables children to achieve positive adaptation despite prior or concomitant adversity” (Luthar, 2003, p. 258). The dynamic developmental process of resilience presupposes exposure to adversity and risk factors that when counteracted can lead to positive adjustment outcomes.

Stress is a negative feeling or emotional state resulting from work as a teacher (Kyriacou, 2001). “These feeling may involve anger, tension, frustration or depression and are generally perceived as constituting a threat to self-esteem or well-being” (Howard & Johnson, 2004, p. 400). Okebukola and Jegede (1992) determined five clusters of stressors for science teacher: Curriculum facilities, student characteristics, administrative, and professional growth and self-satisfaction. Soyibo (1994) found that difficulty in obtaining science teaching equipment was perceived as the most stressful factors by science teachers in Jamaica. Stress can impact many facets of life. It can result in impaired health; reduced self-confidence and self-esteem; and damaged personal relationships (Howard & Johnson, 2004).

Protective factors are those characteristics that distinguish resilient from non-resilient people (Howard & Johnson, 2004). Protective factors can be internal including individual skills such as a sense of agency, pride in achievements and competence in areas of personal importance (Howard & Johnson). External factors such as a strong support group may include family members as well as peers (Howard & Johnson).

Subjectivity Statement

The role of the researcher in qualitative research is critical. In this study, the researcher played a duel role. During methods classes and student teaching, the researcher was both a co-instructor and supervising teacher. In this capacity, the researcher was able to observe the participants and have conversations that enabled the researcher to recognize them as exhibiting characteristics of resilience. This foundation carried into their novice years of teaching where a growing friendship between me as researcher and the participants may have influenced the outcomes of interviews and observations.

The researcher's age and gender may have posed an influence on the result of the interviews with participants. It was not uncommon for an interview to become in part a 'venting' session in my perceived role as 'friend' and 'Mom.' Since all four participants were female and much younger than myself, the roles of friend and Mom were easy to slip into and difficult to draw away from.

The researcher's long years of experience as a teacher also colored the lens through which participants were viewed. Having experience in several schools and grade levels may have influenced my dealings with the four participants.

Preview of the Chapters

The dissertation is organized into six chapters. Chapter 1 is the introduction, statement of the problem, purpose and rationale, research objective, an overview of the theoretical framework and methodology, and a definition of terms. Chapter 2 presents a review of the literature. Chapter 3 discusses the methodology, methods for data collection, timeline, details of data analysis, and a brief description of participants and their context. Chapter 4 presents four case studies detailing the participants and their context. Chapter 5 discusses the results of a cross-case analysis linking

research questions and theoretical framework to conclusions. Chapter 6 presents conclusions and recommendations for practice and further study.

CHAPTER 2

REVIEW OF THE LITERATURE

Man never made any material as resilient as the human spirit
Bern Williams

Introduction

In recent years, interest in teacher resilience is linked to the demand for qualified teachers that do not leave the profession within the first five years of teaching. Rather than looking from the perspective of what is causing the high attrition rates, recent research on resilience focuses on what is right that enables teachers to survive and thrive during their novice years of teaching. Literature informing this study is divided into two sections. The first is literature focusing on resilience within the context of historical movement that began with the structure and function of ecological systems followed by developmental psychopathology. Over time the psychopathology model evolved into the more positive approach of building on strengths. Areas highlighted include: the historical overview, evolving definitions and resilience as a process. Terms used in this review included “resilience,” “protective factors and coping strategies,” “personal, professional and environmental factors,” “traits,” “processes,” “pathology,” and “self-efficacy.” The search was aided by databases that included Journal Storage (JSTOR), full texts on resilience, articles on resilience, relational culture theory and resilience theory articles found on-line. The second section is literature related specifically to novice teachers. Areas highlighted include: definition and characteristics of the novice teacher, stress, burnout, and coping strategies used by novice teachers. Terms used in this review include “novice teacher,” “stress,” “burnout,”

"coping strategies" and "support systems." This chapter will conclude with an annotation of the theoretical framework used to guide the study.

The review of literature that was relevant to this study is a synthesis of studies on the scholarly work concerning the evolving notion of resilience as it applies to the novice science teacher. The primary focus involves novice science teachers in their first two years of teaching with an emphasis on risk factors and protective factors that impact their ability to build resilience. This review helped to identify both the existing information and that which has not yet come to light and by so doing, helped to frame this study.

Resilience

Historical Overview

Holling (1973) first introduced the concept of resilience in his research on ecological systems. Since that time, the notion of resilience also grew in importance as a concept for understanding how young people, mostly children, survived high-risk situations. Influenced by stress and coping theories, resiliency theory was developed within developmental psychopathology and ecosystems perspectives and is characterized by a philosophical orientation toward connections between earlier life stages and adulthood for those considered to be at-risk (Smith-Osborne, 2007). Werner's longitudinal study in the 1970's of 698 infants, many of Hawaiian and Asian descent provided an empirical basis for the inception of resiliency constructs in humans and hypotheses for further testing (Smith-Osborne). Werner's study suggested four clusters of protective factors and processes that enabled high-risk individuals to become competent and caring adults. The first cluster included the ability to elicit positive responses from caring persons. Cluster two regarded skills that enabled the efficient use of individual abilities (realistic educational plans, household responsibilities). Cluster three

considered competent caregivers who fostered self-esteem, and Cluster four protective factors consisted of trusted and supportive adults i.e. grandparents, mentors, church groups (Werner, 1993).

Following Werner's longitudinal study, Rutter (1979) conducted research concerned with early onset mental disorders and like Werner focused on risk or protective mechanisms and processes. Rutter argued that protective factors could do much to "aid normal development even in the worst circumstances" (p. 297) and that protective factors enable children to develop normally in spite of stress and disadvantage. Rutter's protective factors included the development of self-esteem, the availability of personal bonds and intimate relationships and the acquisition of coping skills. Coping skills enable an individual to successfully cope with a stressful situation and recover. Coping skills can either deal directly with the problem causing stress or they can reduce the symptoms of stress without addressing the source e.g. taking up a hobby. Protective mechanisms and processes employed to counteract risk factors became the linchpin for further study.

In 1987, during the Fifth International conference on Early Identification of Children at Risk, Frankenburg argued in favor of focusing on strengths that seem to protect some children who are at high risk for developmental handicaps rather than the historical approach of confining attention to pathology and problems (Grotberg, 1996). Using the idea of focusing on strengths as a mainspring, The Bernard van Leer Foundation supported conference held in 1991, focused on "Building on People's Strengths" (Grotberg, 1996, p. 1) and was soon followed by other national and international meetings on resilience with emphasis on children who overcame the odds of risks and adversities to become well-adjusted adults. One such collaboration, The International Resilience Project, a study of parental, teacher and caregiver efforts to promote resilience in

children, determined that resilience does not develop in a vacuum, but rather, develops within a context that includes support systems, acquired skills and enhanced inner strengths (Grotberg, 1996). “Parents and other care givers promote resilience in children through their words, actions, and the environment they provide. . . . They encourage children to become increasingly autonomous, independent, responsible, empathic, and altruistic and to approach people and situations with hope, faith, and trust” (Grotberg, 2003, p. 8).

Thus, evolving data led researchers away from the notion that resilience is an internal phenomenon, into studying the external factors implicated in the development of resilience (Masten et al., 1990) and to understanding the underlying protective processes (Luthar, Cicchetti, Becker, 2000) that were suggested by Werner and Rutter. Building on this previous research, Henderson and Milstein (2003) suggested that a person’s resilience in different negative circumstances, whether connected to personal or professional factors, can be enhanced or inhibited by the nature of the settings in which that person works, the people he or she works with and the strength of beliefs or aspirations.

In 1986, Miller’s work with women drew attention to the importance of relationships in individuals characterized as resilient. Miller’s clinical practice with women led her to an understanding of how contextual and relational experiences contribute to the psychological well-being of all people (Robb, 2006) and not just those in therapeutics. This is evidenced in VanBreda’s (2001) work, which included relational experiences in family resilience, community resilience, resilience in social work and deployment resilience. Several recent articles have also been written on workplace resilience and the significance of relationships in the retention of workers (Martin, 2005; Wilson & Ferch, 2005). Miller argued that relationships are the central need in human life. Following the publication of Miller’s groundbreaking book, *Toward a New*

Psychology of Women, Relational-Cultural Theory (RCT) was conceived, in which relationships in the lives of Miller's clients became a central focus. RCT is grounded in the idea that healing takes place in the context of mutually empathic growth-fostering relationships (Comstock et al., 2008). Miller concluded, "Individual development proceeds only by means of connection" (p. 83).

In agreement with Miller (1986), Judith Jordan (1992) suggested, instead of focusing on resilience from a model of development that emphasized the self as separate, that resilience be seen as a relational dynamic, with a movement toward empathic mutuality. Jordan suggested that through mutual empathy, disconnected people could be brought back into a place of connection where healthy psychological growth can occur. Jordan warns, "Connection is not a simple, cozy, or easy concept; viewed as the primary organizer and source of motivation in people's lives, it is powerful, complex, and revolutionary, challenging some of the basic tenets and values of 21st-century Western culture" (p. 1). Jordan suggested that researchers could no longer look within the individual for factors that facilitated adjustment, but rather, they needed to examine the relational dynamic which encouraged the making of connections.

Using the idea of forming relationship to promote emotional health, research such as that conducted by Miller et al. (2004), laid the groundwork for expanding the notion of connections for individual development in a clinical context into other arenas. Fletcher (2004) used the relational model of growth and development to explore women's experience in the workplace and workplace resilience. Walker (2004) described her study on race, self and society in terms of relational challenges and a culture of disconnection. In a study specific to teachers, Tait (2008) looked at resilience as a contributor to novice teacher success. Tait described teachers' resilience

as “one of the assets that many beginners bring to their first teaching position” (p. 57) and one that is necessary for the survival of the novice teacher.

Building on the foundation of previous research, researchers have come to recognize some traits and characteristics of people deemed to be resilient as opposed to those who are not resilient. VanBreda (2001) included the following factors present in resilient individuals: outgoing personality, high self-esteem, positive coping skills, autonomous and independent, possesses a sense of agency (i.e. a belief in the ability to control one’s destiny), and are able to ask for support when needed. According to the literature many resiliency characteristics associated with successful adaptations are overlapping. Individuals deemed to have resilient characteristics do not necessarily possess all the internal cognitive styles and coping skills to blanket all adversities (Kumpfer, 1999). Mampane and Bouwer (2006) suggest, “Environmental and individual protective factors play a prominent role in determining the type of resilience the individual will demonstrate” (p. 455). Thus, the notions of resilience have evolved from the belief that people were born with characteristics that made them resilient to an understanding that resilience is something that occurs over a period of time as an individual interacts with their environment. In addition, research has revealed that resilience is not an all-encompassing trait, but one that is reliant on specific circumstances.

Looking at resilience from another perspective, Bronfenbrenner and Crouter (1983) recommended social ecology models, or person-process-context models to study relationships of contextual risk, protective factors, intervening processes, and individual characteristics. Rutter (1987) also favored a view of resilience as processes rather than static factors. Kumpfer’s (1999) resilience framework included both process and outcome constructs arranged in four domains of influence: acute stressor or challenge, environmental context, individual characteristics, and the

outcome. Two additional domains refer to points for transactional processes and are the confluence between the environment and the individual as well as the individual and choice of outcome. Kumpfer's six major predictors of resilience are:

- Stressors or Challenges – Activates resilience process. Degree of perceived stress is dependent on perception, cognitive appraisal and interpretation of the stressor as threatening.
- External Environmental Context – Balance and interaction of risk and protective factors and processes in individual's domains of influence (family, community, culture, school, peer group)
- Person – Transactional processes between individual and environment
- Internal Self-Characteristics – Internal individual spiritual, cognitive, social/behavioral, physical and emotional/affective competencies or strengths needed for successful interactions in different developmental tasks, cultures and personal environments.
- Resilience Process – Short or long-term resilience or stress/coping processes learned through gradual exposure to increasing challenges and stressors that help individual to bounce-back.
- Positive Outcomes – Successful adaptations in specific developmental tasks, which in turn become supportive of later positive adaptations in specific new tasks that can result in likelihood of becoming a resilient individual.

Kumpfer (1999) asserts, "All six of these major cluster variables or constructs are needed to organize predictors of resilient outcomes in high-risk youth because research studies have reviewed these different constructs as predictive of resilience in an individual" (p. 184). Kumpfer

suggests that the basis for designing more effective prevention programs comes from research on the successful processes or transactions between the individual and the environment.

Resilience Defined

Resilience is variously defined throughout theoretical writings (Luthar et al., 2000). Werner and Smith (1992) for example, defined resilience as the human capacity to overcome privation and trauma and to show positive adaptation in the face of that adversity. Smith-Osborne (2007) conceptualized resilience as "relative resistance to psychosocial stressors or adversity" (p. 157) with central constructs including risk factors, vulnerability factors and protective factors. Broadly defined, *risk factors* are "external or internal influences or conditions that are associated with or predictive of a negative outcome (DeMatteo & Marczyk, 2005, p. 21). Single parenting and family unemployment are examples of risk factors (Cicchetti, Rogosch, Lynch & Holt, 1993). *Vulnerability factors* include any outcome resulting from negative effects of difficult circumstances, whereas, *protective factors* moderate negative effects by directing outcomes toward more optimistic paths as seen with external support groups.

Jordan (2006a) described resilience as the ability to bounce back from adversity and to manage stress effectively as well as withstand physical or psychological pressures. Luthar, Cicchetti, and Becker (2000) determined resilience to be "a dynamic process encompassing positive adaptation within the context of significant adversity" (p. 543). Thus, according to these researchers resilience can be viewed as a two-dimensional construct, first as the exposure of adversity and secondly, the positive adjustment outcomes of that adversity.

Tait (2008) moved the notion of resilience beyond the realm of psychopathology by linking resilience to personal efficacy and emotional intelligence when describing resilience in novice teachers. Self-efficacy refers to a person's belief in his or her ability or competence in

different situations (MacArthur & MacArthur, 1999). Having self-efficacy means believing that one's own efforts can make a difference (Maclean, 2004). Tschannen-Moran and Woolfolk Hoy (2001) also linking resilience with efficacy argued that people with high levels of personal efficacy possess strong resilience. Tschannen-Moran and Woolfolk Hoy saw personal efficacy as a future-directed human strength linked to action. Whereas, they deemed highly resilient individuals as reactive to stressful situations, highly efficacious individuals they saw as proactive. Tschannen-Moran and Woolfolk Hoy reported that novice teachers completing their first year of teaching that had a high sense of efficacy, found greater satisfaction in teaching and had more positive sources of personal efficacy, such as planning and executing successful lessons. Unlike a personality trait, resilience is a dynamic process. It is not something that is genetic in nature (Masten & Powell, 2003). As people grow and gain experience in self-management and thinking skills, resilience characteristics become more pronounced and developed across the life span.

Ungar (2008) argues for a nonstandard definition of resilience. He states that the arbitrariness of distinctions between behaviors that are adapted or not adapted could be the result of ethnocentrism. He therefore defines resilience as more closely associated with outcomes from negotiations between individuals and their environments for resources with which to define themselves as healthy in conditions that are collectively viewed as adverse. In this setting, resilience exists as a trait of an individual's social and political setting. Ungar further argues that "there has yet to be presented a coherent definition of resilience that captures the dual focus of the individual and the individual's social ecology and how the two must both be accounted for when determining the criteria for judging outcomes and discerning processes associated with resilience (Ungar, p. 224).

Resilience as a Process

Richardson (2002) describes resilience as “the process of coping with adversity, change, or opportunity in a manner that results in the identification, fortification, and enrichment of resilient qualities or protective factors” (p. 308). The introduction of resilience as a process facilitates the targeting of preventive interventions. Resilience is a process that happens over time. It can be short-term or long-term and include “stress/coping processes learned by the individual through gradual exposure to increasing challenges and stressors that help the individual to bounce-back with resilient reintegration” (Richardson, Neiger, Jensen, & Kumpfer, 1990, p.184). Resilience is not a childhood given, but rather, is a capacity that develops over time in the context of person-environment interactions (Engleland, Carlson, & Sroufe, 1993).

As a dynamic developmental process, resilience is not a personality characteristic, but rather presupposes exposure to substantial adversity (Luthar et al., 2000). Protective factors can help moderate a person’s reaction to adversity in the resilience process. Protective factors are “those dispositional attributes, environmental conditions, biological predispositions, and positive events that can act to contain the expression of deviance or pathology” (Garmezy, Masten, & Tellegen, 1984, p. 109). Werner and Smith (1992) termed protective factors as specific circumstances, experiences, or resources that ameliorate or buffer a person’s reaction to a specific situation. DeMatteo and Marczyk (2005) characterized protective factors more generally as “external or internal influences or conditions that decrease the likelihood of a negative outcome or enhance the likelihood of a positive outcome” (p. 21). As an integral part of the resilience process protective factors help to moderate, contain, and buffer reactions.

Protective factors can include individual skills such as social competence, problem-solving ability and a sense of purpose (Howard & Johnson, 2004). Smith-Osborne (2007) argued

that protective factors and related mechanisms are “traits, contextual characteristics, and interventions that operate to enhance or promote resistance, or which may moderate the effect of risk factors, and for which there is empirical evidence of association with health and functional developmental outcomes” (p. 157). Each description underscores positive outcomes as the central tenet of protective factors. Carver (1998) took the notion of protective factors a step further by indicating that individuals not only return to a homeostatic condition, but can also acquire new skills, knowledge, confidence, and enhanced interpersonal relationships as part of the process of resilience.

Two salient points are emphasized throughout the literature on protective factors as a part of the resilience process. The first is that protective factors and risk mechanisms vary according to the type of adversity, resilient outcome and stage of life in which the individual resides (Luthar et al., 2000; Masten & Powell, 2003; Masten Best, & Garmezy, 1990). The second is that “factors outside as well as within the individual need to be considered within the context of person-environment interactions” (Rutter, 1990, p. 182). The idea of resilience as a process in which an individual is able to bounce back from negative experiences, challenges people and educators to focus on strengths rather than deficits (Malcolm, 2007). Thus far research on resilience proposes the use of protective factors to act as a safety net and buffer the effects of adversity and in so doing may contribute to the building of resilience in an individual. Looking at resilience as a process allows one to look beyond an individual’s comfort zone. With each adverse event, positive results can make an individual more adaptable to their environment and better prepared to meet additional challenges (Sroufe & Rutter, 1984).

Novice Teachers and Resilience

There is little to no distinction between expectation for novice and experienced teachers. In theory, novice teachers are prepared through methods classes and field experiences, to make good instructional decisions (Green, 2006). Green's (2006) study found that the novice teachers are expected to begin their first day of work doing the same sorts of things as their experienced counterparts. Specifically, novice and veteran teachers alike are expected to determine content, design curriculum, create activities and assessments and consider different learning styles and needs. Green posits that with such high expectations it is not uncommon to find a novice teacher feeling overwhelmed.

Novice Teachers

The term novice teacher can include preservice teachers, persons enrolled in college and university teacher education programs, and in alternative certification programs, as well as those in their first five years of practice (Davis, Petish & Smithey, 2006). The novice teacher is most often a recent graduate from a college or university teacher education program and has many of the same professional needs as veteran teachers in addition to stressors that are unique to a teacher's initial years of teaching. These can include disparity between teacher preparation and job requirements, isolation and lack of support, and emerging gap between novice teachers' vision of teaching and the realities of the job. In a study conducted by Huberman and Vandenberghe (1999) disparities such as these were found to lead to teacher burnout. Levels of attrition among novice teachers were estimated to be as high as 40-50% within the first five years on the job (Ingersoll & Kralik, 2004). In rural and disadvantaged areas, teacher attrition is even more pronounced (Ewing & Manuel, 2005). Tait (2008) indicates that these findings are similar

to those in other North American studies, which report that novice teachers' initial optimism can turn to pessimism as the school year progresses.

In addition to high expectations, many novice teachers enter the profession under difficult and stressful conditions (Wood & McCarthy, 2002). Kardos and Liu (2003) shared the following from their study on novice teachers:

- Thirty-three percent of new teachers are hired after the school year has already started
- Fifty-six percent of new teachers report that no extra assistance is available to them as new teachers
- Few teachers begin teaching with a clear, operational curriculum in hand

The unfortunate consequence of these facts is two-fold: first, too often some of the best and brightest novice teachers leave the profession too early in their career; second, students in classes of novice teacher too often get shortchanged (Achinstein & Athanases, 2006).

Kardos and Johnson (2007) conducted a study to understand how novice teachers experience their work with their colleagues. Their findings revealed significant challenges and concerns for novice teachers. Nearly half of the teachers in the four states involved in the study reported that planning for lessons and teaching is done alone. A second finding was that new teachers perceive that "they are expected to be expert and independent, even in their earliest year of teaching" (p. 2096) and that they are expected to attain this expertise independently. In their study on novice teachers, Davis et al. (2006) summarized challenges incurred by novice science teachers into five categories. Each category is addressed below.

- Challenges related to understanding the content and disciplines of science
- Challenges related to understanding learners
- Challenges related to understanding instruction

- Challenges related to understanding learning environments
- Challenges related to understanding professionalism

Challenges Related to Understanding the Content and Disciplines of Science

This challenge refers to the novice teachers understanding of the "major concepts, assumptions, debates, process of inquiry, and ways of knowing" (Davis et al., 2006, p. 613) that are central to the science disciplines being taught. Novice teachers are knowledgeable in areas of science for which they are certified, but not necessarily for areas in science that they are assigned to teach. Beginning teachers are often given assignments outside of their certification areas creating an additional hurdle for the novice teacher to overcome.

Challenges Related to Understanding Learners

The category of understanding learners focuses on the novice teacher's ability to understand how students learn and develop. This category resonates with findings that teachers unfamiliar with the culture of their school often find challenges in creating successful teaching and learning environments for their students. Recognizing and responding to student diversity can be a difficult hurdle to overcome and new teachers often don't have the experience or background to tackle the diverse needs of all their students.

Challenges Related to Understanding Instruction

Challenges related to understanding instruction, refers to a teacher's understanding of the advantages and limitations associated with instructional strategies. This is often a skill that comes with experience and therefore can be accomplished with time and successful use of diverse strategies.

Challenges Related to Understanding Learning Environments

This challenge refers to setting up a productive science learning environment. This most often depends on a novice teacher's classroom management skills. Collaboration among students and inquiry-oriented science are emphasized in the standards and requires strong knowledge of assigned subject areas to implement innovative teaching strategies.

Challenges Related to Understanding Professionalism

This category involves being a reflective practitioner and one who searches out opportunities for professional growth. Finding supportive colleagues, learning about their school and community and developing as a reflective practitioner are connected to Jordan's notions of building resilience through connections. Several researchers have focused on the concept of fostering significant relationships as the key in understanding resilience in novice teachers. Howard and Johnson (2004) found in their research that all their teacher participants had "diverse, caring networks of family and friends outside school" (p. 412). Brunetti (2006) concluded, "If they (teachers) are supported in their work, as this study suggests, and if they are provided with sufficient resources to get the job done, they are likely to persist in the classroom" (pp. 821-822). Bobek (2002) suggested "As resources, the relationships that new teachers cultivate provide networks of support that can ease the transition into teaching and help sustain teachers over time" (p. 203).

Going beyond the necessity of resilience in novice teachers, Howard and Johnson (2004) argued in their study that resilience is important for all teachers, not just those new in the field. Resilience can enhance teacher effectiveness as well as elevate career satisfaction. Gu and Day (2007) elaborate on Howard and Johnson's statement that resilience is important for all teachers by including the following three reasons. First, in order for students to be resilient, teachers, as

role models, must also be resilient. Second, " a shift in focus from teacher stress and burnout to resilience provides a promising perspective to understand the ways that teachers manage and sustain their motivation and commitment in times of change" (p. 1302). Third, the ability to bounce back in the face of adversity is closely linked to "a strong sense of vocation, self-efficacy and motivation to teach.

Stress and Burnout

Education is a prime example of an occupation where the relationship between providers and recipients is central to the job. As such, providing affective instructional and moral services to pupils of necessity makes emotional demands on the service provider (Huberman & Vandenberghe, 1999). Howard and Johnson (2004) noted that teacher stress and burnout are two separate but related phenomena. Stress is seen as a negative feeling or emotional state that is the result of working as a teacher (Kyriacou, 1989). Whereas, burnout is a type of job stress that occurs among professionals who deal extensively with the needs of other people (Maslach & Jackson, 1984). Another explanation of stress and burnout is that posited by Le Compte and Dworkin (1991) "Most investigators describe burnout as a product of stress" (p. 91).

Kyriacou's (2001) study on stress and burnout summarized research findings into ten main risk factors experienced by teachers. These include: teaching students who lack motivation; maintaining discipline; time pressures and workload; coping with change; being evaluated by others; dealing with colleagues; self-esteem and status issues; problems dealing with administration/management; role conflict and ambiguity and poor working conditions. When teachers fall victim to burnout they are likely to be less sympathetic toward students, exhibit lower tolerance for classroom disruption, are less prepared for class and are less committed to their work (Farber & Miller, 1981).

Resilience Strategies

According to Kyriacou's (2001) study on strategies for dealing with teacher stress, two main types have surfaced: direct action techniques and palliative techniques. The first refers to what teachers can do to eliminate the source of the stress. "Direct action techniques may involve simply managing or organizing oneself more effectively; it may involve developing new knowledge, skills and working practices; it may involve negotiating with colleagues, so that aspects of one's situation are changed or dealt with by others" (p. 30). Examples include such things as seeking support, having significant adult relationships and being able to organize and prioritize events.

The second technique is palliative, which does not deal directly with the source of stress, but rather aims to lessen the feeling of stress that may occur. "Palliative techniques can be mental or physical. Mental strategies involve the teacher in trying to change how the situation is appraised. Physical strategies involve activities that help the teacher retain or regain a sense of being relaxed, by relieving any tension and anxiety that has built up" (Kyriacou, 2001, p. 30). Palliative techniques considered dysfunctional include avoidance behavior, drinking and smoking. Those techniques deemed to be functional are involvement with hobbies, exercise and relaxation techniques (Howard & Johnson, 2004).

Creating support systems through the building of relationships is another strategy that can provide novice teachers with the foundation necessary to see them through stressful situations. Of importance is the role that peers can play in providing personal and professional support to each other (Le Cornu, 2009). The development of reciprocal learning relationships as defined by Le Cornu's *mutuality*, is a "learner's commitment to and responsibility for their own learning and well-being, as well as that of other members of the community" (p. 719). Le Cornu's (2009)

study found in order to maximize success and lessen stress in novice teachers they needed to not only nurture their own well-being but also that of their peers. “This emphasis resonates with the Jordan model of relational resilience which emphasizes strengthening relationships rather than increasing an individual’s strength” (Le Cornu, 2009, pp. 721-722).

Giving and receiving support both professionally and personally from peers was found to play an important role in developing *courage*. Courage enables novice teachers to not only deal with continually occurring changes in the school environment, but also to undertake more risks and create more connections that foster growth. The use of support systems is a strategy whose central focus of relational resilience is in the movement toward empathic mutuality. Mutuality means that each person in a relationship and the relationship itself can change and move forward because of mutual influence and responsiveness (Covington, 2007). Jordan (1992) suggests that we can “no longer look only at factors within the individual which facilitate adjustment; we must examine the relational dynamics which encourage the capacity for connection” (p. 1). Jordan (2006a) suggests that the desire to participate in relationships that foster growth is the core motivation in life. She further indicates in her study that it is a person’s engagement in “mutually empathic and responsive relationships as the more likely source of resilience (p. 80).

Fox and Wilson’s (2008) study on support systems included connections with higher education institutions, organizations in business, industry and arts sectors, other schools and social links. “Participation in committees, involvement in professional development activities and conferences, and roles beyond the classroom can be a source of *empowerment* and reward for the new teacher if she or he considers that their contributions have been recognized and valued” (Ewing & Manuel, 2005, p. 10). Novice science teachers have unique needs (Davis et al., 2006) and as such the need for resilience strategies are more pronounced.

Theoretical Framework

A theoretical framework is a collection of interrelated concepts that guides the research. The framework of the study is a structure that can hold or support a theory of a research work, much like a scaffold can hold a painter and all the supplies necessary to complete the job. It presents the theory, which explains why the problem under study exists. The framework provides a clear lens through which to see the variables of the study and provides a general framework for data analysis. Resilience as a framework is consistent with the perspective that the study of developmental processes under extraordinary conditions can inform our understanding of both typical and atypical development (Linley & Joseph, 2004b). The authors assert, “Prevention scientists and advocates of a positive approach to psychology have touted the resilience framework for its potential to inform efforts to foster positive developmental outcomes among disadvantaged children, families, and communities” (p. 521).

Resilience Theory

C. S. Holling first introduced resilience theory in 1973. His theory held two premises. The first is that humans and nature are strongly coupled and co-evolving and should therefore be considered one social-ecological system. The second is that the assumption that systems respond to change in a linear, predictable fashion is wrong. Instead, systems are in constant flux and as such are unpredictable and self-organizing with feedback across time and space (Corso, 2010).

Combining insights gained though work on resilience over the past eighty years have improved understanding of what individual resilience is and how it is manifested in novice teachers. Examples of how the progression of theory development and generalization has worked, is evidenced in research on resilience that has evolved from clinical settings to include the general public. Resilience theory currently addresses individuals, families, communities,

workplaces and policies. VanBreda (2001) suggested, “Resilience theory speaks to the strengths that people and systems demonstrate that enable them to rise above adversity” (p. 1). Redman and Kinzig (2003) contend “resilience theory is an expanding body of ideas that attempts to provide explanations for the source and role of change in adaptive systems, particularly the kinds of change that are transforming” (p. 14). At the core of resilience theory is individual adaptive cycles, which are nested in a hierarchy across time and space. “These nested hierarchies may have a stabilizing effect due to the fact that they provide the memory of the past and of the distant to allow recovery after change occurs” (Redman & Kinzig, p. 1).

Over time, resilience theory signaled the emergence from being strictly ecological in nature to one of pathology and eventually to an increase in emphasis on strengths (Rak & Patterson, 1996). This change in focus corresponds to that of other research in child development and education (O’Leary, 1998). Agreeing with O’Leary, VanBreda (2001) argues that resilience theory has its roots in the study of children who proved resilient despite adverse childhood environments. McCubbin and McCubbin (1992) noted that both theory and research have advanced in the direction of strengths and capabilities, thus enhancing the capability for intervention. Schwartz (1997) advocates for the view of resilience as something that promotes compassion, flexibility and the ability to bounce back after an encounter with adversity.

Key concepts for understanding resilience sprang from the observation that some individuals exposed to adversity could still achieve positive outcomes. These individuals exemplify patterns of resilience, which stem from the interaction between internal assets of an individual and their external environments (Gu & Day, 2007). Focusing on individual resilience, Polk (1997) synthesized four patterns of resilience. The first, dispositional pattern entails aspects of an individual that promote a resilient disposition towards life stressors. Included in this pattern

are a sense of autonomy or self-reliance, a sense of basic self-worth, and good physical health and appearance. The second pattern is relational and concerns an individual's role in society and relationships with others. Third are situational patterns, which address aspects involving a link between an individual and a stressful situation. Included in this pattern are an individual's problem solving ability and the ability to take action in response to a stressful situation. Last is the philosophical pattern, which refers to an individual's worldview of life paradigm and can include one's belief that positive meaning can be found in all experiences.

Coping mechanisms are central to an individual's resilience and is "the thing people do to avoid being harmed by lifestrain" (Pearlin & Schooler, 1982, p. 109). Pearlin and Schooler identified three types of coping. In describing the first, responses that change the situation out of which stress arises, the authors describe this type as not often used. People do not always recognize the situation that is causing the stress. The second, responses that control the meaning of the stress is the most common type. This mechanism can entail making positive comparisons to reduce the severity of the stressful situation. It can also ignore parts of the situation and concentrate on less stressful aspects thereby reducing the relative importance of the stressors in relation to one's overall life situation. The third, responses that function more for the control of the stress after it has emerged, does not attack the situation itself. This focus involves basic stress management responses that "convert the endurance of unavoidable hardships into a moral virtue" (Pearlin & Schooler, p. 117). A group intervention based on Pearlin and Schooler's "model of coping and adaptive behavior: attacking the problem, rethinking the problem, and managing the stress" (p. 105) increased support from work sources promoting positive constructive coping skills. In so doing, this further supports the move toward focusing on strengths rather than deficits of individuals.

Relational Culture Theory

Relational resilience "has its theoretical underpinnings in relational-cultural theory (RCT) which has as its core the belief that all psychological growth occurs in relationships" (Le Cornu, 2009, p. 718). Because relational culture theory is nested within resilience theory, it is a part of the theoretical framework for this study. Relational-Cultural theory (RCT) first emerged following Jean Baker Miller's work with women (Comstock et al., 2008). In contrast to the theories of counseling and human development that emphasize individuation, separation, and autonomy as markers of psychological health and emotional maturity, Miller's (1986) work suggested that it is the contextual and relational experiences that lead to psychological well-being of all people (Comstock et al.). "Relational resilience involves movement toward mutually empowering, growth-fostering connections in the face of adverse conditions" (Jordan, 2006a, p.83) Growth-fostering connections are characterized by mutuality, empowerment and the development of courage (Le Cornu, 2009).

Movement toward mutuality is at the core of relational resilience. Jordan (2006) indicates that it is not just the fact that relationships offer support, but that they also provide an opportunity to foster growth for each person in the relationship. Mutuality is not just a one-way notion, but rather, includes making a contribution as well as receiving support (Le Cornu, 2009) and being able to produce change in each other and in the relationship. "It brings us into the warmth of the human community where real resilience resides. And it contributes to the development of community, the ultimate source of resilience for all people" (Jordan, 2006a, p. 84).

Empowerment is one of the building blocks of relational resilience and enables participants to experience energy, creativity and flexibility (Le Cornu, 2009). Empowered teachers have control over decisions that affect the school workplace in general and the

classroom in particular and they can participate more directly in the school decision-making process. Le Cornu (2009) emphasized that feelings of empowerment can come through developing relationships with mentors and other support groups in which power is a shared entity and can result in a positive attitude and believing in oneself. Short (1994) adds teacher status, autonomy, opportunities for professional development, and teacher self-efficacy as dimensions of empowerment.

Relational resilience also involves the development of courage. Courage is the "capacity to move into situations when we feel fear or hesitation" (Le Cornu, 2009, p. 720). In contrast to the notion that courage involves jumping from airplanes or other individual acts of daring, courage can also be considered an interpersonal experience. Those interactions that are encouraging promote zest, sense of worth and a desire for more connections (Jordan, 2006a). Personal and professional support and encouragement enables the novice teacher to take risks in trying new ideas and in building resilience.

Constructivism

The theoretical framework for this study is a collection of multiple interrelated concepts, which include resilience theory, relational culture theory and constructivism. According to Adler (1997) constructivism is a social theory on which constructivist theories of resilience – for example, risk factors and protective factors used by novice secondary science teachers – can be based. Constructivism can illuminate important features of resilience that were previously obscure and have practical implications for empirical research. It provides a foundation for this study to explain the nature of novice teachers' resilience building process and allows the researcher to examine that process from the individual's perspectives.

The goal of constructivism is the promotion of wellbeing through an individual's continuous expansion of self-conceptualization with the understanding that the sense of self emerges and changes primarily in relationship to others (Mahoney & Granvold, 2005). Constructivism focuses on strengths, personal resources and human resilience. Using the constructivist approach encourages the examination of different types of dynamics e.g. resisting or adapting to adversity. It also leads us to consider the objects involved in the dynamics, for example, the participants chosen for this study (Bijker, 2008). It is this basis that provides a framework to explain the nature of novice high school teachers' resilience building process and allows the examination of this process from their perspective.

Summary of the Chapter

This chapter discussed the literature and theoretical underpinnings that informed the present study. The review of the literature focused on three areas of scholarship: resilience within the context of historical development, novice teacher stress and resilience strategies, and the theoretical framework used to guide the study. Historical review began with the work of Holling in developing the concept of resilience in his research on ecological systems in 1973. The concept of resilience later became a part of research involving human subjects. Works of Werner and Smith, and Rutter became the basis of future studies on resilience in humans.

The second focus of the literature review highlighted stressors unique to novice teachers incurred during the initial years of teaching. To counteract those stressors, two main types of strategies were discussed. The theoretical frameworks used to guide the research are the interrelated concepts of Resilience Theory, Relational Culture Theory and Constructivism.

CHAPTER 3

METHODOLOGY AND PARTICIPANTS

Introduction

Methodology is the research design that shapes the choices and uses of particular paradigms, and links them to desired outcomes (Cohen, Manion & Morrison, 2007; Crotty, 2003). It is the plan of action employed to meet the goal of answering the questions raised by the researcher. This study employed an interpretive case study approach to investigate how selected high school science teachers were influenced in their response by personal life space factors, organizational factors and their professionalism to challenges in their initial years of teaching. In particular, this chapter discusses the participants, the context of the study, the methodology employed, specific methods, data collection techniques and data analysis techniques.

Participants and Context

The study centered on four novice secondary science teachers, who had recently completed a secondary science teacher education program at a large, state university in the southeastern United States. Creswell (2007) recommends multiple case study research should contain no more than four cases. Cases should "be selected because they represent the program or phenomenon" (Stake, 2006, p. 23) as well as relevance, diversity and opportunities to learn about experiences in context. For this study, cases were selected based on the following: (1) certified as a secondary science teacher by the state education agency; (2) employed full-time at a public high school; (3) completed science-specific teacher preparation program and (4) were recognized to likely demonstrate a high degree of resilience as novice science teachers in their

science teaching contexts. Participants were approached soon after being hired for their first teaching position. In choosing the participants, the researcher observed signs of resilience during their methods classes and preservice term. In addition, during their student teaching period, classroom visits provided additional information on resilient qualities exhibited by the participants. All four teachers are female, although gender was not considered a sampling criterion. All four participants attended methods classes together at the same university and completed student teaching in schools that were in close proximity to the university. During the course of the participant's first and second years of teaching there were opportunities to discuss educational experiences and spend time in the schools in which they worked. The educational accounts of each of the novice teachers as well as a description of the context in which they were working are described below. Pseudonyms chosen by the researcher were used to protect the identity of the four participants in the study: Barbara, Jennifer, Sara and Linda.

Barbara

Barbara is a single twenty-nine year old Caucasian female. She has a B.A. in biology and M.S. in marine science. Barbara has T-5 certification in Science (6-12) and Biology (6-12). T-5 indicates Teacher certification at the Master level. Barbara worked as a research assistant at a southeastern university and learned research techniques and field experience that helped with understanding content as well as providing ideas for hands-on activities she would later use for labs with her own classes. Barbara also had experience working as a biology laboratory assistant performing such tasks as setting up labs and maintaining a greenhouse. During her practicum period, a time in which university students taking methods classes observe in classrooms and take on limited teaching responsibilities, Barbara taught 6th grade earth science and 9th grade

biology. While student teaching, Barbara's experiences included 10th grade advanced biology and 12th grade environmental science.

Jennifer

Jennifer is a single twenty-nine year old Caucasian female with a B.S. degree in science education. While attending college Jennifer worked as a waitress, which she said helped her to hone her people skills and cope with adversities. Jennifer is certified to teach Biology, Broad Field Science, AP Environment and English to Speakers of Other Languages (ESOL). Jennifer completed her student teaching at a rural high school teaching classes in biology and environmental science before accepting the job as an ESOL biology teacher.

Sara

Sara is a single twenty-four year old Caucasian female with a B.S. degree in Science (Biology) and M.Ed. in Science Education. She is certified to teach 6-12 Science (Biology) and 6-12 Earth and Space Science. During her field experience, Sara observed in middle and high school grades 7-10. She also had the opportunity to teach lessons in grades nine and ten. Sara completed her student teaching at a rural high school teaching classes in ninth grade biology and tenth grade physical science before accepting the job as a biology teacher.

Linda

Linda is a married Caucasian female and has a two-year old daughter. She is certified in both biology and physics and completed her Master's Degree. She completed her student teaching at a suburban high school. Prior to entering her teaching career, Linda was in a pre-med program and said that the program experience helped her to understand how to work with patients in a way that would allow her to get the needed information to make an accurate

diagnosis. She commented in an interview that she was able to transfer this knowledge and experience to working with students.

Context

The context is the cultural, temporal and physical/geographical setting. It is the circumstances in which the study takes place. Contextualization is critical for understanding the reality of the participants (Holloway, 2005). “Writing a piece of qualitative work includes this context so the reader too can grasp the whole picture and does not merely receive a disembodied and context-free text or description of data that have no connection or link to a storyline” (Holloway, p. 275).

Barbara worked in a rural school as defined by the National Rural and Small Schools Consortium (1986) as having a district with inhabitants numbering fewer than 150 per square mile or if the district is located in a county where 60% or more of the population lives in communities of 5,000 or fewer. This rural school had a predominantly black population (76%) with a relatively low median household income ($37, 044) and over half the student population receiving free or reduced lunch. Having at least 40% of students enrolled in the free and reduced lunch program qualifies the school for Title 1 funds. The principles of Title 1 state that schools with large concentrations of low-income students will receive supplemental funds to assist meeting student’s educational goals (Green, 2010). Thus under Title 1 guidelines, Barbara’s school was considered a Title 1 school.

Sara, Linda and Jennifer worked in suburban schools whose student population was predominantly white with less than 40% of the student population receiving free or reduced lunch. Household income for Linda’s school is nearly half that of Jennifer and Sara’s. Total pupil expenses for schools in which Barbara, Sara and Jennifer taught are nearly equal at $11,757 and

$11,777 respectively. Linda's school district allocated the least amount per pupil at $8,575. Although household incomes for the schools in which Barbara and Linda taught are somewhat comparable, the free and reduced lunch percentage is nearly halved, putting Linda's school close to eligibility for Title 1 funds but far below the 76% for the school in which Barbara worked. A table presenting this information is available in Appendix C.

Methodology

This study employed an interpretive case study approach. This approach was grounded in the more broadly based naturalistic paradigm and the distinctive assumptions associated with this paradigm. Lincoln and Guba (1985) describe those assumptions as: (1) realities are multiply constructed and holistic; (2) knower and known are interactive and inseparable; (3) only time and context bound working hypothesis; (4) all entities are in a state of mutual simultaneous shaping, so that it is impossible to distinguish causes from effects; and (5) inquiry is value-bound.

According to Lincoln and Guba (1985), multiply constructed realities can only be studied holistically and inquiry into these multiple realities will eventually raise more questions than it answers. Therefore, prediction and control are unlikely outcomes although some level of understanding can be achieved. Because knower and known are inseparable, inquirer and object of inquirer interactions influence each other. Using these tenets of the naturalistic paradigm, the aim of the inquiry is to develop an idiographic body of knowledge that describe individual cases with an understanding that all entities are in a state of mutual simultaneous shaping so that it is impossible to distinguish causes from effects. Lastly, inquiry is value bound and as such inquiries are influenced by inquirer values, the choice of the paradigm that guides the investigation into the problem, the choice of the substantive theory utilized to guide the

collection and analysis of data and the interpretation of findings, and the values that inhere in the context.

The purpose of research derived from the logic of a naturalistic world-view is the quest for meaning; how people make sense of their lives, what they experience and how they interpret those experiences (Merriam, 1991, p. 19). Having selected a naturalistic orientation, interpretative naturalistic case study emerged as the appropriate approach well suited to understand how selected factors contribute to shaping novice science teacher resilience. As Yin (1989) suggested, a case study is appropriate for research that asks how and why research questions about contemporary events over which the researcher has limited control. Allowing for the emergence of descriptions and interpretations to capture and conceptualize the phenomenon of teacher resilience made this context amenable to a case study approach.

For this study, case study design was selected in order to explore the factors that influenced the building of resilience in novice secondary science teacher. Case studies are a viable research strategy in that they allow the researcher to study information in a natural setting and understand the nature and complexity of the processes taking place (Benbasat, Goldstein & Mead, 1987). The purpose of this type of research is to “investigate a contemporary phenomenon in depth and within its real-life” (Yin, 2009, p. 18).

Case study research explores a bounded system (a case) or multiple bounded systems (cases) over time through detailed, in-depth data collection involving multiple sources of information with several levels of analysis (Creswell, 2007; Stake, 1978; Yin, 1989). In this study, a multiple case study design was selected and boundaries were determined by the relational connections made by the participants and the school community in which each participant worked. This approach was commensurate with the objective to treat each case as a

separate study in which evidence is sought regarding facts and conclusions and then application is made to analyze within and across all cases to identify emerging themes (Chin, 1989). “In multicase study research, the single case is of interest because it belongs to a particular collection of cases” (Stake, 2006, p. 4). Stake argues that the cases in the collection are bound together by a “quintain”. A quintain in multi-case study is the target collection, the umbrella for the cases studied. “Multicase research starts with the quintain. To understand it better, we study some of its single cases – its sites or manifestations” (Stake, 2006, p. 6). The use of cross-case tactics allowed the researcher to go beyond initial impressions and thus improve the likelihood of accurate and reliable outcomes (Eisenhardt, 1989).

Case study research is related to the researcher’s theoretical framework by attempting to construct meaning concerning teacher resilience as the teachers engage with the world they are interpreting. Aligned with my theoretical assumptions of constructivism as the interpretive framework, this study is designed to contribute to knowledge about novice secondary science teacher resilience through ideas that emerged during a two-year study that explored the experiences of the individuals (Crotty, 2003).

Methods

This research involves studying real-world situations as they unfold naturally, non-manipulative and non-controlling with openness to whatever emerges (Patton, 2002). Therefore, data collection and data analysis were a recursive and dynamic interactive process and occurred simultaneously. Specifically, the researcher used in-depth, semi-structured interviews collected between August 2008 and August 2010 as well as data sources from observations conducted during work shadowing, a written prompt to elicit metaphors for personal resilience, relational maps depicting support groups and unobtrusive data.

Interviews

Interviews supplied much of the data for this research. The purpose of the interview was to allow the researcher to enter into the teacher's perspective to understand their response to change by aspects of their personal, professional and contextual lives. The resulting narratives gave access to the complicated social and educational issues the teachers faced in their initial years of teaching. Interviews were used to convey their experiences and to gain insight into how they interpreted those events.

At the outset, the interviews were semi-structured in nature to allow the richness of detailed personal perception to emerge. Multiple interviews were conducted with each novice teacher in the study. As the study progressed and rapport developed between participant and interviewer, the interview became more conversational in nature. They ranged in length from forty minutes to seventy-five minutes depending on time constraints. Each interview was transcribed verbatim prior to the next interview in order to familiarize the researcher with the data and to prepare questions for the following interview. As interviews were transcribed, clarifying questions specific to that participant were emailed to the interviewee and clarifying responses were included in the data collection. Sample interview protocols for succeeding interviews for participants and their mentors can be found in Appendices A1-A6). Case narratives were later developed and shared with the participants and their feedback was recorded.

Work Shadowing

Work shadowing is the observation of a jobholder in action with the goal of learning something about how that role is performed (Goldberger, Kazis, & O'Flanagan, 1994). In this study work shadowing was conducted to observe the participants in their natural surroundings to gain insight into their working lives and enrich descriptions of the personal attributes ascribed to

each individual in the study. Interviews were also conducted with the person deemed most supportive to the participant during the course of the school day. This process was used as a supplemental source of descriptive data on the context of the four participants' work lives.

Written Prompt

Prior to the third interview, participants were sent via email, written prompts to react to. Written prompts are relatively rigid in that they are predetermined. However, responses to a prompt can be flexible and open to more semi-structured interview opportunities (Hancock, Ockleford & Windridge, 2009). An interviewer can use prompts to encourage the interviewee to give more consideration to their response about a specific question or topic. In this study, each participant was asked to respond in writing to the following short prompt:

> Resilience is the positive capacity of an organism to cope with stressful situations. Among aquatic organisms, resilience can be seen in the horseshoe crab and the Rudd, a member of the carp family. The horseshoe crab has existed since the age of dinosaurs because it tolerates a wide range of salinities and pollutants, subsists on a wide variety of foods, lives in water and on land, and withstands the heat of summer and cold of winter. Similarly, the European Rudd, accidentally introduced in North America, thrives in difficult environmental conditions. The Rudd is found in cold and warm water lakes and rivers from Maine to Florida. It survives in water that is muddy and clear, polluted and unpolluted, and highly oxygenated and with little dissolved oxygen. Both the horseshoe crab and Rudd are resilient; they survive in challenging environments by relying on their strengths to adapt.
>
> To counter the effects of stress in the high school environment, science teachers, much like the horseshoe crab and the Rudd, need to be resilient. As I have followed you through this school year, I have observed you cope with what I consider stressful teaching and school situations for a first year teacher.

Two follow-up questions based on the prompt were posited to each participant during the third interview: (1) What factors have facilitated your resilience as a first year teacher? and (2) What relationship do you see between your resilience and staying in the science teaching profession and remaining at your school for a second year? Answers to these questions during interview three provided deeper insight into the participants' views on resilience.

Relational Maps

Mapping is a visual tool based on a fundamental thinking process and used for showing relationships. It is characterized by the use of geometric symbols connected with lines or arrows depicting entities, relationships and attributes (Chen, 1976). In this study the mapping process is used as a primary source in understanding the role of supportive relationships in building resilience in novice secondary science teachers and how those relationships change over time. Most importantly, having the participants in this study create a relational map of personal support groups during the first and second year of teaching gives the researcher insight into the importance of those evolving relationships for building individual resilience.

Unobtrusive Data

In qualitative studies, unobtrusive data provide insight into the phenomena under study without interfering with the enactment of the study. They are not filtered through the perceptions, interpretations or biases of the research participants and their collection does not interfere with ongoing events in the research (Hatch, 2002). In this study unobtrusive data include such items as lesson plans that the participants were most proud of, school maps, county directives and examples of the use of technology hardware and software in science teaching. Table 1 shows the relationship of the methods employed and the research questions.

Procedures of the Study

The primary source of data collection was interviews. Over a two-year period six interviews were conducted and each interview was audio recorded and transcribed. The following steps were followed throughout this longitudinal study:

A. During August 2008, the first interviews with the participants were conducted to establish background information.

Table 1

Research Questions and Data Collection Methods Employed

Research Questions	Methods Used	Form of Data Collected
1. What are the risk factors faced by novice secondary science teachers identified as resilient?	Interviews	Interview transcripts
	Written prompt	Written response to prompt
	Observation	Notes
	Work shadowing	Notes and transcripts
	Unobtrusive data	Lesson plans, student projects, map of building
2. What protective factors do resilient teachers employ?	Interviews	Interview transcripts
	Observation	Notes
	Relational maps	Diagram of relational connections
3. How do risk factors and protective factors facilitate the resilience process?	Interviews	Interview transcripts
	Observations	Notes
	Relational maps	Diagram of relational connections

B. During November 2008, the second round of interviews were conducted to understand their participation in extracurricular activities and to elicit their first relational map.

C. During April 2009, the third interview and job shadowing for a day was conducted. The written prompts that participants responded to by email were used as a starting

point for further elaboration on their thoughts of resilience. This time was also used to identify and set-up a meeting time with the person the participant deemed to be of significant support, during their first year of teaching.

D. During April 2009, the interview with the significant support person was conducted to understand exchanges between support provider and participant from the perspective of the support provider. In some cases the participant was present and became a part of the conversation. Transcripts reflected both conversations.

E. During February 2010, member checking with each of the participants to find if data were interpreted in a manner congruent with participant's expectations.

F. During April 2010, the fifth interview was conducted to elicit a personal definition of resilience and stress and to understand which protective factors were invoked during times of stress. The participants diagrammed a second relational map. Changes between year one and year two in their support providers were noted and participants were asked to elaborate on the changes.

G. During May 2010, the final interview was conducted to elaborate on previous information and to understand why the participant chose to remain in the profession.

Data Analysis

Yin (2009) makes no distinction between single case and multiple case studies. The choice is considered one of research design, with both being included under the case study method. Yin posits that with the multiple case study the unit of analysis can be unitary or multiple and the design can be holistic (single unit of analysis) or embedded (multiple units of analysis). According to Lincoln and Guba (1985) multiply constructed realities can only be studied holistically. Therefore in the multiple case studies a holistic unit of analysis included

teacher participants, their support systems and the schools in which they worked. The process for cross case analysis in multi case studies introduced by Stake (2006) provides insight into the target factors that build resilience in novice secondary science teachers. Both common and unique issues were sought to address important and complex problems associated with the target issue of resilience. Data were first analyzed independently using an inductive, open coding process, argued by Stake (2006) as the main activity in cross case analysis. Charmaz (2006) suggested that this initial process leaves the researcher open to exploring whatever theoretical possibilities can be discerned from the data. Use of inductive open coding in this study allowed the researcher to condense extensive data, establish clear links between research objectives and summary findings, and develop a theory about underlying structure of processes evident in the raw data (Thomas, 2003).

Data analysis began with initial coding (Glaser & Strauss, 1967). The first phase consisted of line-by-line review of the data collected from transcripts, relational maps and unobtrusive data generated from the individual teachers and their main support person. The line-by-line coding was kept open-ended to allow ideas to emerge and to identify any gaps in the information. The second phase consisted of axial coding (Strauss & Corbin, 1990) to synthesize and organize the wide-ranging segment of data accumulated.

Axial coding related categories to subcategories and specified the properties and dimensions of the category (Charmaz, 2006). “Axial coding provides a frame for researchers to apply. The frame may extend or limit your vision, depending on your subject matter and ability to tolerate ambiguity” (Charmaz, p. 61). The resulting data were then consolidated into four cases around the emerging themes describing each participant (Merriam, 1998).

In the third phase, individual cases were analyzed using themes identified in the data. Stake (2006) emphasized the importance of identifying themes in analyzing data from each case independently before conducting a cross case analysis. In order to provide a deeper understanding of the resilience process, the researcher had to move beyond the mundane identification of themes, and look closely at conditions in which the theme arose, what interactions were involved and what consequences resulted. Tables depicting themes for each participant can be found in Appendices B1-B4.

Cross Case Analysis

Simply identifying themes across four cases is not the endpoint. Cross case analysis was conducted by the researcher with specific core variables common across all four cases as a way to discover or reinforce constructs, while at the same time identifying and accounting for particularities (Miles & Huberman, 1994). The researcher used cross case analysis to deepen the understanding and explanation by pinpointing the specific conditions under which findings occurred and by helping to form more general categories of how conditions may be related (Miles & Huberman).

The main activity of cross case analysis in this research was to read the case reports and apply their findings of situated experience to the research questions of the quintain (Stake, 2006). Starting with the case reports, several themes were identified and developed. Case findings were then categorized by their utility, prominence or a typicality and tentative assertions were made based on the research questions. The heart of the cross case analysis was the assertions about the quintain. The next section confronts the issue of validity and the need for qualitative research to verify the match between the story and the data.

Validity

In this study the researcher analyzed data to understand how and why novice secondary science teachers experience success and enjoyment despite conditions that research suggests could cause them to leave the profession or transfer to another school. In qualitative research triangulation is typically a strategy used for improving the validity of research findings. Triangulation is the process of gaining assurances that most of the meaning gained by a reader from the researcher's interpretations is the meaning the researcher intended (Stake, 2006). Mathison (1988) states that triangulation is an important methodological issue in naturalistic and qualitative approaches to establishing valid propositions. In this research triangulation was used within cases to assure a clear and suitable meaningful picture free of biases. Patton (2002) advocated the use of triangulation as a means of strengthening a study. The process of triangulation occurred throughout the fieldwork and analysis stages of research. In this study triangulation within each case was addressed with multiple types of data: transcripts, relational mapping, unobtrusive data, and job shadowing. Member checking was also used as a means of triangulation in which participants were asked for feedback on data collected during the first year of research, thus providing the opportunity to assess adequacy of data and preliminary results as well as to confirm particular aspects of the data. Triangulation for a multi-case study occurs along the way. Organizing and writing this research paper accomplished some of this task.

Lincoln and Guba (1985) identified four criteria used to establish trustworthiness of findings that were used in this study: credibility, transferability, dependability and confirmability. Credibility in this study was established by collecting data over an extended period of time. Specifically, data were collected during the first and second years of four novice teachers' careers. Prolonged engagement was necessary to minimize the possibility of distortions

generated by the researcher as well as the participants. Time was also necessary to learn the context and to create the opportunity to build trust between the researcher and participants (Lincoln & Guba).

Credibility in this case was also addressed by selecting multiple representative cases to study the resilience process in novice secondary science teachers and triangulation through multiple types of data. Transferability was provided through use of standard non-idiosyncratic terminology and analytic frames of reference. Lincoln and Guba (1985) argued that transferability cannot be specified. Instead, the researcher provided sufficient information through rich, thick descriptions that included interview transcripts, relational mapping and field notes from job shadowing. Dependability and confirmability is the researcher's ability to demonstrate the neutrality of the research interpretations. This was provided through detailed transcripts, analysis notes, and records documenting aspects of this study.

Summary of the Chapter

This chapter provided a detailed description of how data were collected for this research. Interviews were the primary source of data collection and allowed the researcher to enter into the perspective of each teacher. Work shadowing allowed the researcher to make contextual observations while written prompts provided an opportunity for the researcher to extend interview questions and elicit the participants' personal definition of resilience. Relational maps were a visual description drawn by the participants to depict their support systems. Unobtrusive data provided the researcher with the means to create a better-rounded picture of each participant. These multiple sources provided resources for the researcher to create a comprehensive description of each of the four cases. The next chapter presents the four cases investigated in the study.

CHAPTER 4

FINDINGS, ANALYSIS, AND INTERPRETATION

Introduction

In a multiple case study the single case belongs to a particular collection of cases that share common characteristics and are bound together by a quintain (phenomenon to be studied). In this study, the quintain is resilience in novice secondary science teachers and each case is representative of a participant in the study. Looking beyond understanding the case, the multi-case study looks to understanding what the cases can reveal about the quintain. Case studies reflect the complexity of relationships by focusing attention on relationships connecting ordinary experiences in natural settings to the concerns of academic disciplines (Stake, 2006). The phenomenon of resilience operates in many different situations. Each case will illuminate the contexts that give rise to resilience in novice secondary science teachers and show change in risk factors and protective factors. Stake (2006) suggests, “The study of situations reveals experiential knowledge, which is important to understanding the quintain” (p. 12). The four cases highlighted in this study are relevant to the quintain and provide diversity across complex contexts. Miles and Huberman (1994) stated that it is important to obtain representative samples of all the cases to which users may generalize. The case narratives address the three research questions:

- What are the risk factors faced by novice secondary science teachers identified as resilient?

- What protective factors do resilient teachers employ?
- How do risk factors and protective factors facilitate the resilience process

Each case will begin with a description of the context. “The case’s activities are expected to be influenced by contexts, so contexts need to be studied and described, whether or not evidence of influence is found” (Stake, 2006, p. 27). The context is followed by extensive narrative descriptions, which include the uniqueness of each case situation and case findings, presented as themes. Each theme is linked to the process of resilience including stressors and protective factors. Distinctions are made between the participants’ first and second years of teaching, using relational mapping to highlight the participants’ support systems. Garmezy (1985) concluded that the availability of external support systems that encourage and reinforce coping efforts operate as protective factors to counteract stress caused by exposure to adversity. Kyriacou (2001) indicated that coping strategies that take direct action includes having significant adult relationships.

The final section of this chapter consists of a summary of the chapter. Embedded topics emerging from each case are highlighted in ***bold italics*** for emphasis. Portions where direct quotes from the novice secondary science teachers are used, quoted words are *italicized* and references are provided. Original words or format of the relational maps were not altered. In each case, the relational maps prepared by the participants are shown followed by the role of the support person to the resilience process.

The Four Cases Narratives

Narrative 1: The Case of Sara

Context

Sara was a resilient, efficacious Caucasian single female in her mid-twenties with a focused sense of purpose. Sara’s initial years of teaching were in a large suburban high school

just outside of a major metropolitan area. The school's student enrollment averaged 2,522 with approximately 162 teachers. The campus setting housed several buildings one of which was designated as the Freshman Academy during Sara's second year of teaching. The school's student population consists of 80% White, 8% Hispanic, 6% Asian, 3% Black and 3% Native American. Only 8% of the student population received free or reduced lunch. The median household income was $72,331 and the total per pupil expenditure was $11,777.

Sara had three days of new teacher orientation before preplanning for her first year of teaching. During our first interview in August of 2008, Sara described her orientation as including the history of the school system and introductions of important people from the system. Following the system-wide orientation, the new teachers were given a school orientation that included an introduction to the technology hardware and software available in the building. This was followed by a tour of the school and a meeting with the school principal during which new teacher expectations were discussed. Those expectations included general guidance concerning teacher conduct and dress codes, adherence to Georgia state standards and meeting the diverse needs of each student. In addition to countywide and school orientation, Sara met with her science department and was given a syllabus and a curriculum map to help guide their lesson planning and pacing.

Sara was assigned a mentor at the start of her first school year and each mentor was assigned only one person. Sara's mentor taught AP Biology and Honors Biology and had been a teacher at the school for four years. Sara and her mentor had the same planning period and their classrooms were located across the hall from each other. Although she visited her mentor on a daily basis at the beginning of the school year, by November of 2008 in an interview, Sara mentioned that as the school year progressed she felt less of a need to conference with her

mentor on a daily basis and was more confident in her ability to handle the daily routines. Sara's need for less mentoring reflects the notion that coping is a process that changes with changing circumstances (Smith & Carlson, 1997).

Sara's induction program was divided into two stages. The first stage was an introduction to the countywide school community and provided opportunities to network across the county with coworkers. The second stage was conducted within her school where mutual support within peer groups was encouraged and the needs of novice teachers were addressed. Wang, Odell, and Schwille (2008) states that "teacher mentoring has been widely used to support goals of teacher induction, ranging from helping beginning teachers stay in their jobs, adapt to their school contexts, and learn to teach in ways consistent with curriculum standards" (p. 146). Sara was well positioned to have a successful beginning as a novice secondary science teacher and commented during initial interviews how easy the transition from university to her first teaching position seemed. The context of Sara's first year of teaching created opportunities for her to gain confidence from successful interactions with her school environment.

Case Findings-Themes

The uniqueness of Sara's case stems from the fact that she is a self-admitted type "A" personality driven by the need for perfection and respect. *I am very organized for the most part, and a type "A" personality to say the least. I think that definitely helps to have that kind of organized mind set and kind of lays down my expectations* (Interview, Spring 2009, lines 40-48). Scott (2007) depicts the type "A" person as achievement oriented and impatient with delays. These persons are often competitive and work obsessed. According to Scott, this type of personality comes with a more increased risk of health problems due to continued stress. Sara's type "A" personality not only resulted in stress but also acted as a protective factor during both

her first and second year of teaching. Her personality prompted stress when she took on several extra-curricular activities. At the same time, her personality acted as a protective factor by rationalizing that taking on extra work and being highly organized was helping her to achieve her goal to be an excellent teacher. Throughout the two-year study, Sara's classroom was neat with folders and binders holding student materials for each science unit. Her daily handouts were in piles on her desk in the order in which they were to be used. When the researcher asked to see some of her students' work, Sara could easily retrieve artifacts and describe their connection to the standards

Fall of the first year, Sara was aggressive in setting and achieving goals. Sara's mentor accurately portrayed this attribute in her description of her first encounter with Sara when she was a university student. The exchange that took place between Sara and her mentor occurred at a National Science Teachers of America (NSTA) conference in 2007. Her mentor recounted the following excerpt. *I presented at the NSTA conference, the year before. She* [Sara] *was there too. She hadn't finished her certification yet. She was going to be starting the next year, and she came up to me after my presentation and wanted all of my materials and gave me her email address. So it was already obvious to me. I actually put her name in to try to help her come here to get a job because I was impressed with her enthusiasm and motivation to learn* (Interview Spring 2009, lines 114-120). Demonstrating her persistence, Sara applied for a science teaching position and was hired in the early summer of 2008.

Sara's drive for excellence in teaching and desire to be respected by administration, co-workers, students, and parents, prompted her to take on several extra-curricular activities during her first year of teaching. She supervised Saturday Academy. This session was for students who had worked with their individual teachers, completed extra work, and still did not understand the

content. The National Honor Society students tutored this group for service hours and Sara supervised twice a month on Saturday mornings from nine to eleven. Sara also volunteered to be the science teacher spokesperson for a committee charged to develop a new Freshman Academy at the school. This later resulted in moving all freshmen and their teachers and administrators to a separate building on the school campus. In addition, Sara volunteered to be an assistant cheerleading coach along with planning her wedding, which took place during spring break, and took classes to complete her Master's Degree.

During her first year, Sara did not perceive these activities as being ***over committed***, but rather, she looked upon this as a way of staying connected with her school community and earning the respect of fellow teachers, administrators as well as students and their parents. *I don't think I can just go home every day after school. I just wouldn't feel like I was a part of anything* (Interview #3, lines 175-177). Sara immersed herself in activities of the school community and considered her cheerleaders and their parents as part of her extended family. *I think that was good for me to do the extra-curricular stuff because the cheerleaders and cheer parents, they're like my family. They had a wedding shower for me, they've been like…true family and they have given me a lot of support and encouragement and it just helped* (Interview# 3, lines 72-76). Sara also mentioned that by engaging extra work after school, she was treated differently than an 8:00 to 4:00 teacher. She felt that by seeing her as a teacher with a solid commitment to kids and a desire to keep the school positive and an exciting place to be, she earned their respect. Despite the fact that she was situated in a non-science classroom, Sara enjoyed her first year of teaching and looked forward with confidence to her second year.

During Sara's second year of teaching, the issue of over commitment became a source of stress. When interviewed during her second year, Sara commented that she was spoiled in her

first year because she had a great mentor and taught only general biology classes. This she said enabled her to revise lessons, grade her tests promptly, give feedback to her students and email parents as to student progress as well as manage extra-curricular activities. During her second year change in personal and professional aspects of her teaching took place. Sara's mentor moved out of state and she was not assigned a new mentor. Sara felt overwhelmed with two different preparations, honors biology and physical science. She described her student population as in need of higher maintenance than her first year students. She had twice as many individualized education programs (I.E.P.'s) to fill out for her students as well as having to design lessons for her English for Speakers of Other Languages (ESOL) students that now populated her classes. Sara was not well versed with the content for physical science and felt unprepared to teach it. Seeking out mentors to help her with content and teaching strategies that met her personal demands of excellence put an additional strain on an already full schedule of teaching and after school activities.

During her second year, Sara graduated from assistant coach to head cheerleading coach for basketball, football and competitive cheerleading. The additional time spent coaching created stress in her daily professional life. Sara found herself trying to manage time between the demands of teaching and coaching. Her marriage during her first year ended in divorce her second year, which created personal emotional stress. She no longer saw some of the administrators as helpful, but rather just demanding more of her time by mandating additional paperwork for students failing the course or in need of remediation or by asking for additional volunteer time for school events.

Sara indicated during the fifth interview that she often turned down invitations to join her friends, opting to work on school tasks indicating that if she did join her friends, she would be

even more stressed thinking about what she left unfinished for school. Her decisions often led to self-isolation from friends and family. Jordan (2004a) emphasized that we are most at risk when we feel most separate from others and from the flow of life. Commenting in retrospect, Sara noted that her first year of teaching seemed easier with only one content area to focus on and less time involved in extra-curricular activities. Sara's second year of teaching was marked with an increase in adversity and the employment of protective factors to counteract stress.

To negotiate mounting stress and tip the balance between demands and enjoyment toward a more centered position, Sara employed protective factors to counteract the risk factors incurred during her second year of teaching. The capacity of an individual to cope during difficulty is central to their resilience. Pearlin and Schooler (1982) define coping as "the thing that people do to avoid being harmed by lifestrain" (p. 109). "By strains we mean those enduring problems that have the potential for arousing threat, a meaning that establishes *strain* and *stressor* as interchangeable concepts" (Pearlin & Schooler, 1982, p. 3).

According to Pearlin and Schooler, there are three main types of coping that serve distinct functions. The first are responses that change the situation out of which stressful experience arises. Pearlin and Schooler (1982) state that it is uncommon for individuals to use the first type of coping mechanism, but for Sara this was synonymous with her aggressive, goal oriented personality and personal skills, including the ability to problem solve, self-efficacy, and sense of purpose (VanBreda, 2001).

With the rise of each situation that Sara identified as stressful, she was able to recognize the source of the problem and then mobilize action toward modifying it. When commuting to and from school through heavy traffic became too stressful in her first year of teaching, Sara moved to an apartment closer to the school during her second year of teaching. When student behavior

was difficult and challenging, she used classroom humor and teaching strategies that included a course plan to give students practice that would make it possible for them to achieve the course goals. When she was overwhelmed by administrative demands, she used her organizational skills to effectively plan her time and stay current on mandatory weekly and monthly reports due to administrators.

The second type of responses identified by Pearlin and Schooler are responses that control the meaning of the stressful experience after it occurs but before the emergence of stress. During interview sessions it was not uncommon to hear Sara rail against causes of her stress and then quickly add that the experience was good for her. These ***conflicted emotions*** emerged as a result of Sara's need to be perceived by coworkers, administration and students as an excellent teacher and in so doing Sara created stress within herself to achieve her goal to be an excellent teacher. Yet at the same time she counteracted the stress by controlling the meaning of stress as something necessary in order to achieve excellence. She did this by making positive comparisons between working long hours and gaining the respect of coworkers, coaches, students and parents.

The third coping mechanism, responses that function more for control of stress after it has emerged was demonstrated in Sara's decisions to take up painting and join a softball team. Again, in an effort to keep a ***balance between the demands of the profession and enjoyment*** in teaching Sara opted for what Kyriacou (2001) described as palliative coping mechanisms. Rather than dealing with the source of the stress, palliative techniques are aimed at reducing the impact of the stressor. Although palliative techniques can be dysfunctional as in drinking and smoking, Sara chose to bolster her mental health through the functional activities of exercise and hobbies.

Sara's most prominent factor in negotiating stressors was her ability to make connections and build extensive support systems characterized by personal, professional and contextual

connections that targeted internal and external risk factors during her initial years of teaching as a novice secondary science teacher. As evidenced in Sara's visual representations drawn in November 2008 and again in April 2010 as part of her coping strategies, her support systems changed in response to change in risk factors in her personal and professional environment.

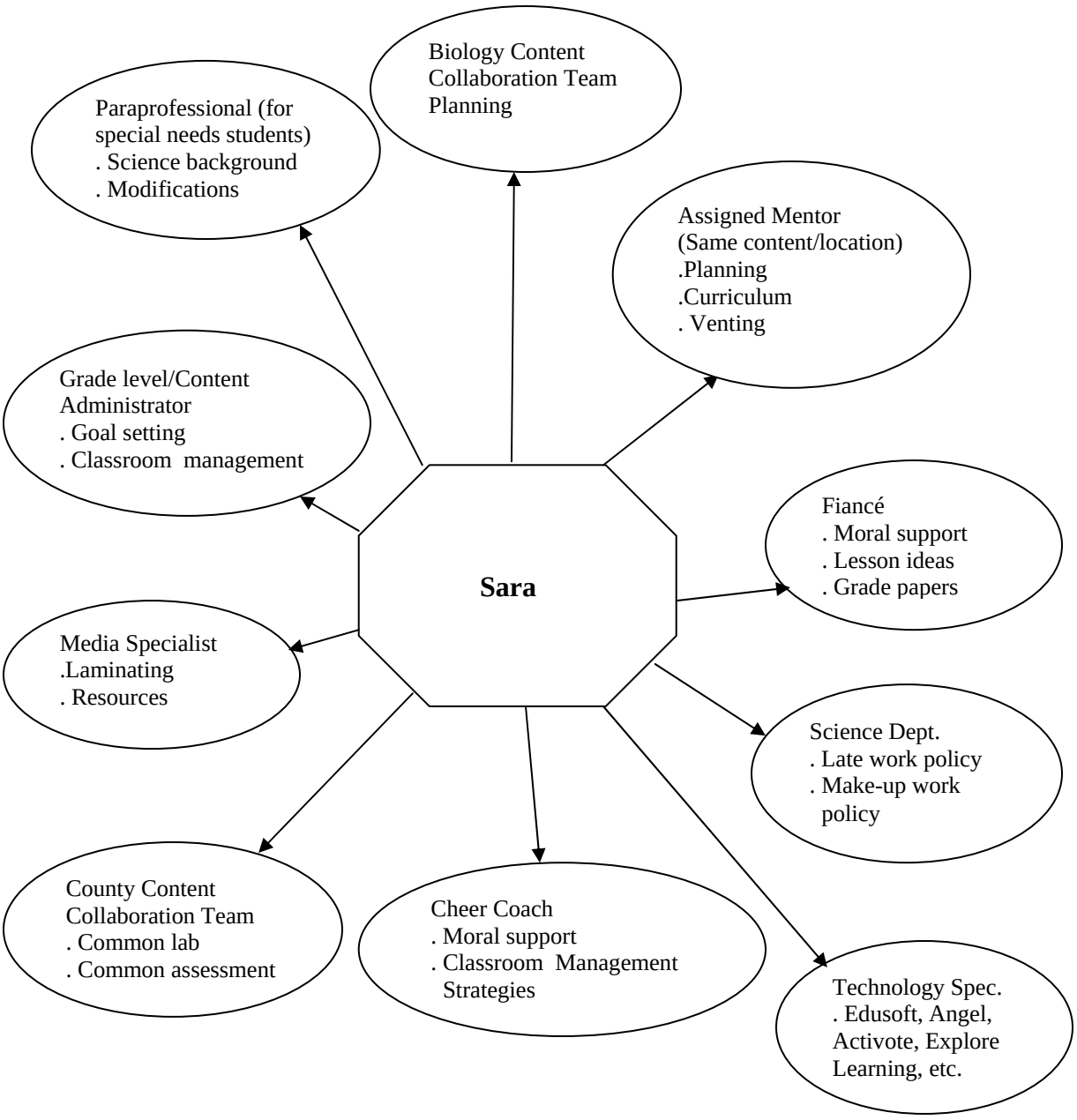

Figure 1. Sara's Relational Map Year 1 (November, 2008).

Sara had a diverse network of family and friends both inside and outside her school environment. Sara's biology content collaboration team composed of members of Sara's school science department and biology teachers from other schools in the school system met once a month. Fostering relationships is part of the protective process in building resilience. Le Cornu (2009) argues that peers play an important role in providing personal and professional support to each other. The team was composed of twelve people all teaching the same course that met to plan lessons. She also met with her science department once a month but described that as mostly administrative in nature with discussions aimed at school policy and procedures. In addition to the collaboration team, Sara had a grade level/content administrator with whom she set goals for percentage of students in her classes that would meet the standards on the End Of Course Test (EOCT). The paraprofessional in Sara's fifth and sixth period classes worked with her special needs students. Sara went to him for advice on strategies to use with students in her other classes that were not considered special needs students but had challenging behavior. The media specialist and technology specialist supported Sara in ways that lent depth to her teaching; finding resources and showing her how to effectively use those resources with her students. In the same sense, the county content collaboration team kept Sara on track with all biology teachers in the county.

Sara's department head assigned a mentor to support Sara during her first year of teaching. The criteria used for matching mentor and mentee are close proximity to the novice teacher's classroom and have taught the same or similar course. Sara's mentor described their relationship as very flexible with common planning times available if they chose to meet. When Sara entered her second year of teaching there was a change in her support group to help guide her through the new challenges of teaching physical science classes and working with ESOL

students. The relational map for Sara's second year is similar to the first but emphasis shifted toward coping mechanisms to provide physical science content support and a more emotionally supportive group and less of one focused on teaching and learning strategies. According to Beardslee and Podorefsky (1988) relationships are protective in a wide variety of risk situations. Sara believed in making a wide range of connections to counteract changing adversity.

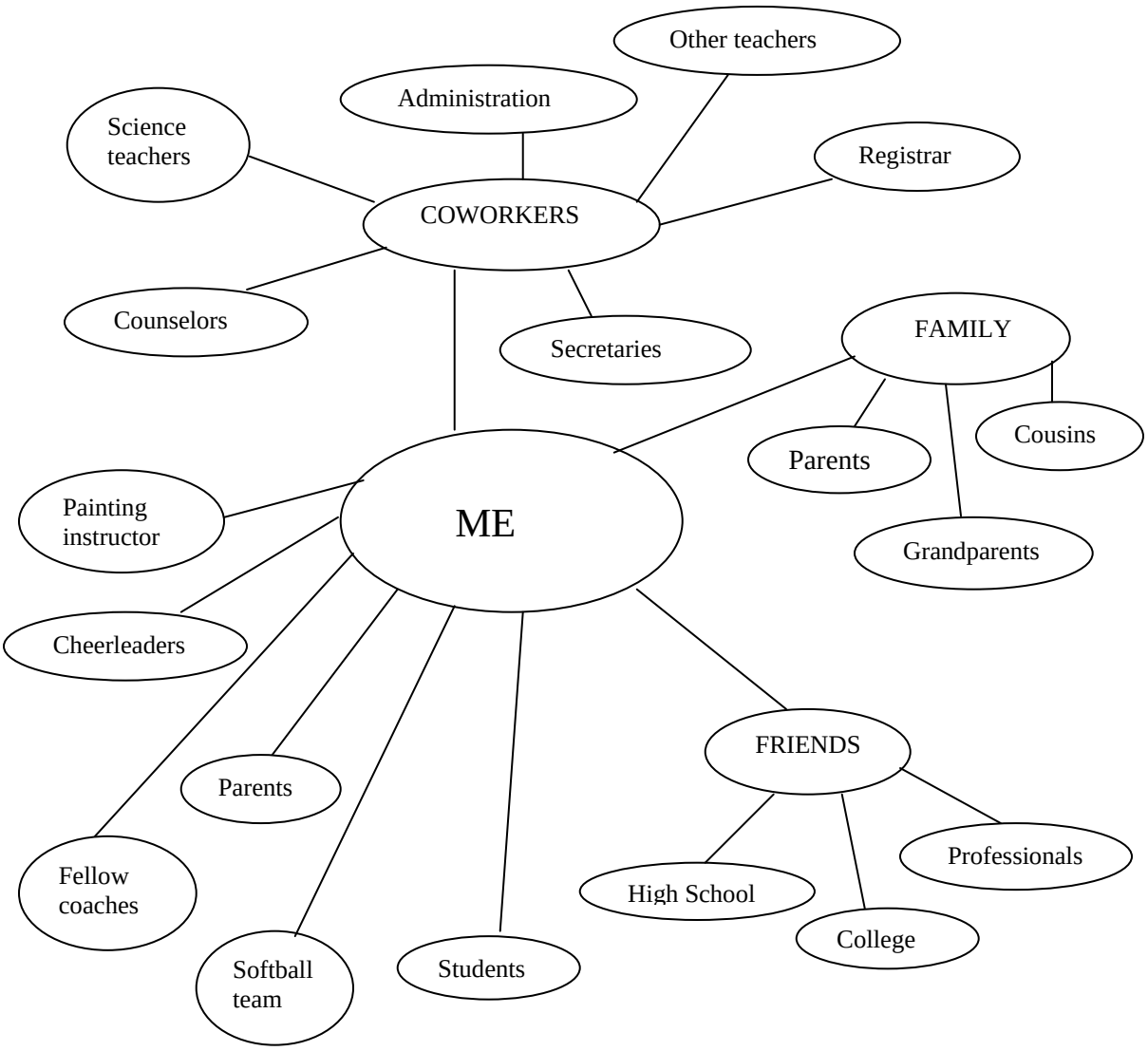

Figure 2. Sara's Relational Map Year 2 (April, 2010).

Sara's diagrams are distinctly different between her first and second years of teaching. In her initial diagram, Sara is the center of her relational support system with direct contact between herself and her sources of support. Although her second diagram still had Sara positioned in the center, her supports were more diversified and categorized to accommodate the changing risk factors in her life: coworkers, family, friends, and the group associated with extra-curricular activities and hobbies. "The capacity to ask for and give support is an essential aspect of most relationships, not just those defined as 'helping relationships'. In a state of stress, personal vulnerability increases, as does the need to enter a more supportive relationship" (Jordan, 2004a, p.33). Jordan also argued that social support could buffer stress and contribute to resilience following exposure to adversity.

In response to a prompt (personal communication, April 2009) on resilience in nature, Sara offered the following personal definition of resilience: *being able to sustain through a long period of time* (Interview #5, lines 61-62*). I think that teaching a long time is a part of it. But then being innovative with your teaching and trying to be better, you have to be resilient to do that* (Interview #5, lines 77-78). When asked to describe a teacher in her school that she saw as having resilient qualities Sara discussed a teacher that had multiple levels of teaching and learning in place to meet the diverse needs of her students. Those levels included not only teaching strategies to meet the needs of her diverse population within the normal classroom setting, but also the use of a computer program designed to accommodate students in need of a more isolated environment to be successful learners. This coincided with what Sara described as her mindset about being a teacher. You choose to be a teacher because *you want to see kids be successful and you want to make a difference* (Interview #5, lines 501-502). During Sara's last interview she was asked what relationship she saw between resilience and staying in the science

teaching profession and remaining in her school. In response she indicated that it depended on the state [referring to cuts in teachers and teacher pay] and her personal life because she missed family who lived a distance from her current teaching position.

Sara is a unique individual whose resilience process had undergone exposure to changing adversity, times of vulnerability and positive adjustments to that change through use of protective processes. Sara's case indicates that she has the characteristics that will enable her to continue to build on her resilience as a novice secondary science teacher.

Narrative 2: The Case of Barbara

Context

Barbara was a resilient and resourceful Caucasian single female in her mid-twenties with an internal sense of coherence, which enhanced her ability to select appropriate tools for dealing with challenges in her initial years of teaching. Barbara began her career in a rural high school situated in the county seat. Student school enrollment averaged 2,116. The high school is a single building a short distance from the center of town. The student population consists of 74% Black, 19% White, 5% Hispanic and 2% Asian and Native American. A total of 76% of the student population received free or reduced lunch, which makes this school eligible for Title 1 funds. Title 1, is a part of the American with Disabilities Act and was created for schools with high numbers or high percentages of poor children to help ensure that all children meet challenging state academic standards. It was designed to reduce the influence of factors such as low income and poverty on student academic success by providing funds through grants for such things as hiring teachers to lower student-teacher ratio, providing tutoring for struggling students, and supporting professional development for teachers. The median household income for geographic

areas of the school system where students' homes are located was $37,044 and the total per pupil expenditure was $11,757.

Barbara's teacher orientation consisted of a review of her health care benefits. Although the state's higher education institutions have been involved in developing resources for new teacher support, Barbara's school offered no orientation during her preplanning period and her school had no mentoring program in place. Barbara chose instead to use her inclusion teacher as her primary mentor. Inclusion involves bringing support services to the students with special needs. An inclusion teacher is a special education teacher who works with special needs students in a regular classroom regardless of handicapping conditions or severity. The class is referred to as an inclusion class (http://www.ehow.com/facts_4924872_what-duties-inclusion-teacher.html). Barbara was assigned three inclusion classes during her initial year of teaching and worked closely with the special education teacher she co-taught with to create teaching strategies that would meet the needs of her diverse population of students.

Both instructors were responsible for parts of the daily lessons and both instructors took responsibility for planning the lessons. Barbara did not have the benefit of meeting with her administrators prior to the beginning of school to become acquainted with school policies and procedures or discuss school goals. This could possibly have been due to the fact that both the principal and assistant principal were also new to the school. As Barbara said, *they haven't quite figured everything out yet* (Interview #1, lines 503-504). With a new administration and no school programs in place to assist novice teachers, Barbara sought help from coworkers and office personnel as she situated herself in her new teaching position.

Case Findings – Themes

The resilience process presupposes exposure to adversity. It is from exposure that individuals can employ protective factors and make positive adjustments in what Fredrickson (2004) refers to as the 'broaden-and-build' theory of positive emotions like joy, interest contentment and love. These resources can "function as reserves that can be drawn on later to improve the odds of successful coping and survival" (p. 1367). Barbara's first year provided evidence of successful accomplishments in meeting student needs and establishing a support system of coworkers, family and friends. Although she was not assigned a mentor by her school, Barbara sought the help of her co-teacher in her inclusion classes as her primary mentor.

School culture is a unique part of Barbara's case and involves patterns of values, beliefs and traditions that have formed over the course of the school's history (Deal and Peterson, 1990). It can include elements of schedule, curriculum, demographics, and policies as well as school interactions that occur within the school. In this research, school culture, like school environment and school climate is indicative of the physical structure of a school building and the interactions between students and teachers. The uniqueness of Barbara's case is centered on risk factors associated with her ***school culture*** in four distinct ways. The first was stress resulting from Barbara's inexperience with low performing students in a school whose ethnic majority was different from her own. The second was stress related to a school history of high turnover rates in administration and school faculty. The third was stress resulting from the lack of administrators' understanding of teachers' scheduling needs and the fourth was stress associated with limited programs available for novice teachers to ease the transition from university to classroom.

Barbara's ethnicity, which was different from the majority of her students, and her inexperience working with low performing students resulted in stress in her first year of

teaching. Despite these challenges Barbara worked aggressively toward understanding her students' diverse needs. Barbara sought ways to bridge the gap between her cultural mindset of teaching and creating an environment that was conducive to learning for her students.

The second issue related to ***school culture*** was a school history of high turnover rates in administration. Turnover does not have to be viewed as necessarily bad. Schools may suffer when a good principal leaves, but they may benefit when an ineffective principal is removed. However Miller (2009) suggested that principal instability is important for three reasons. The first is that school reform takes time with moderately complex changes taking from three to five years. The second is that principal turnover negatively affects teacher retention, teacher quality, school culture, and student achievement. The third is that stability is needed to develop strong, trusting relationships and more positive working conditions. The assignment of a new principal during Barbara's second year occurred just over a year from the previous replacement. Barbara reported that the unsettling event resulted in stress associated with wondering what changes the new administrators would make and how those changes would affect her teaching.

Frequent unscheduled changes in daily routines and teaching schedules not conducive to collaboration with co-workers was the third stressor. Barbara indicated that it was not uncommon to learn about an assembly or pep rally after the start of a school day. Stress resulted from scrambling to change lessons plans and labs to accommodate changes in the daily routine. Barbara described her department schedule as having been set up with no common planning periods for the science teachers. *One person of our department is a coach so he's never here after school. And the person who teaches across the hall, she's part time. So she tends to keep very short hours here. And those are the two other people who teach chemistry. So the two people that I would collaborate for my subject are not here and then geology is just me anyway*

(Interview #2, lines 117-126). The additional stressor of having a science department that consisted of only four full time teachers and one half time teacher compounded this concern during her first year of teaching. This made science teacher collaboration very difficult. Barbara also indicated that all teachers were grouped into clusters for the purpose of collaboration across departments. Clusters consisted of teachers chosen randomly from different departments. Cluster meetings were to be held once a month to discuss school concerns. However, no one in her cluster had common planning time so they did not have an opportunity to meet during school to discuss common concerns and no after school meetings were planned. Barbara also spoke of frequent changes in the daily schedule, which led to stress in trying to adjust lessons and labs that were cancelled to allow for assemblies and pep rallies.

The fourth stressor related to ***school culture*** concerned the limited programs available in the school in which Barbara teaches for novice teachers to ease the transition from university to classroom. Mentoring and induction could bridge the gap between pre-service education and the classroom. “Long-term policy support for teacher induction programs and adequate funding at the state level can help teachers realize their full potential, keep them in the profession, promote greater student learning and save money” (http://www.aascu.org/policy_matters/pdf/v3n10.pdf). Looking beyond her school resources, Barbara took advantage of one of the mentoring programs available in the city in which she resides. During her first year of teaching, she joined a chemistry learning community. The learning community consisted of local high school chemistry teachers and professors from the state university who met once a month to discuss content, teaching strategies and exchange teaching materials. According to Nieto (2003) a learning

community is an important incentive that keeps teachers going. Wenger (1998) indicated that teachers develop aspects of resilient qualities and efficacy when learning in communities takes place.

In retrospect, Barbara commented that the balance between ***risk factors*** and the enjoyment of teaching was fairly equal during her first year of teaching. During her second year of teaching Barbara's enthusiasm for teaching lessened as additional stressors began to surface. Barbara was assigned a new content area to teach and was experiencing very challenging student behavior in her last period class. Unexplained administrative actions led to low teacher morale resulting in stress. Some of the internal issues created a sense of uneasiness as exemplified in the reassignment of a well-liked teacher in the middle of the semester and the incident in which a veteran teacher was put on a professional development plan after speaking out at a faculty meeting on teacher and school concerns.

The results of a faculty survey conducted by a committee appointed by the administration indicated discontent among the faculty and low teacher morale. Barbara relied on her support system during this time to bolster her efficacy and help her to negotiate adversities. "To rebound from setbacks and adversity, teachers need the strength of self-efficacy beliefs; and conversely, their sustained effort and perseverance in the face of difficulty will strengthen their sense of efficacy and result in a stronger sense of resilience (Gu & Day, 2007, p. 1312).

A final issue involved Barbara's yearly evaluation conducted by the assistant principal that resulted in Barbara receiving two 'Needs Improvement' (NI's) on her evaluation. The NI's were prompted by the fact that Barbara was situated in a non-science classroom, which required her to walk the students to the lab across the hall. Although this evaluation was later discarded by the assistant superintendent the incident caused emotional stress in Barbara's second year of

teaching and facilitated her decision to look for alternative employment. Stress is considered to be the main factor contributing to job dissatisfaction along with job related illness (Van Dick, Phillips, Marburg & Wagner, 2001).

Kyriacou (2001) defined stress as a negative feeling or emotional state that was a direct result from work as a teacher. These unpleasant feelings Kyriacou perceived as constituting a threat to self-esteem and wellbeing. The author summarized a number of international studies and listed ten main stressors for teachers, many of which Barbara experienced: teaching students who lack motivation; maintaining discipline; time pressures and workload; coping with change; being evaluated by others; dealings with colleagues; self-esteem and status issues; problems dealing with administration/management; role conflict and ambiguity and poor working conditions. According to Henderson and Milstein (2003) structural constraints within the system could limit individual and organizational efforts to build resilience. Constraints can include unclear discipline procedures and an organizational culture that is reactive rather than proactive.

During Barbara's sixth interview she was asked to describe the protective factors that facilitated her resilience in her second year of teaching, a time in which she was feeling most stressed. She indicated several types of coping mechanisms that helped to counteract risk factors during her second year. The first two factors preserved consistency in an inconsistent environment. Barbara indicated that having some of her students opt to take a second science class with her relieved stress because she already had teaching strategies in place that were successful for that group of students. The second factor was being assigned to teach geology and oceanography for a second year. Having materials and activities already created from the year before lessened the time necessary to prepare lessons. A third factor was the enjoyment she received when her students were successful. In particular she mentioned the Science Olympiad

team that she coached, the I Have A Dream Foundation in which she tutored, the science aquarium trip she organized and the inclusion classes she co-taught with the special education teacher. According to Fredrickson (2004) positive emotions fuel psychological resilience. Nieto (2003) found in her study of American high school teachers, that what kept teachers going in the profession were the successful emotional things.

Barbara's ***protective factors*** included coping mechanisms that met her changing challenges. For example, Barbara participated in Ball Room dancing on weekends. She attended dance lessons or just enjoyed dancing with her significant other. Barbara considered this to be her form of emotional support along with talks she had with her dad who lived within walking distance of Barbara's house. Kyriacou (2001) refereed to this manner of coping with stress as palliative. Granting that palliative techniques do not deal with the source of the stress, it does aim at reducing the impact of the stressor. In contrast, Barbara chose direct action when dealing with the NI's on her evaluation. She spoke with the assistant superintendent and challenged the NI's she received on her evaluation and was successful in having the evaluation removed from her personnel folder. Kyriacou (2001) states that direct action attempts to eliminate the sources of stress and can include taking action to deal with problems; keeping feelings under control; and seeking support from colleagues. Realizing that she would be applying in other school districts at the end of this school year, Barbara took additional steps to take the administrator who had given her the NIs off her reference list and spent the remainder of the year keeping her feelings under control. She realized that it was easy to get caught up in all the negative things that were happening in her school, so she tried to remain positive to the growing negativity within the school.

Literature has provided many sources indicating a tie between forming relationships and building resilience (Brunetti, 2006; Howard & Johnson, 2004; Le Cornu, 2009; Tait, 2008). "Effective protective factors include significant relationships and a sense of connectedness" (Howard & Johnson, p. 403). Below are Barbara's diagrams indicating mutually empowering relationships she deemed as part of her support group. She placed herself in the oval in the center. In each square radiating out from the oval are members of her support group and a brief description of the type of support that was given during her initial year of teaching.

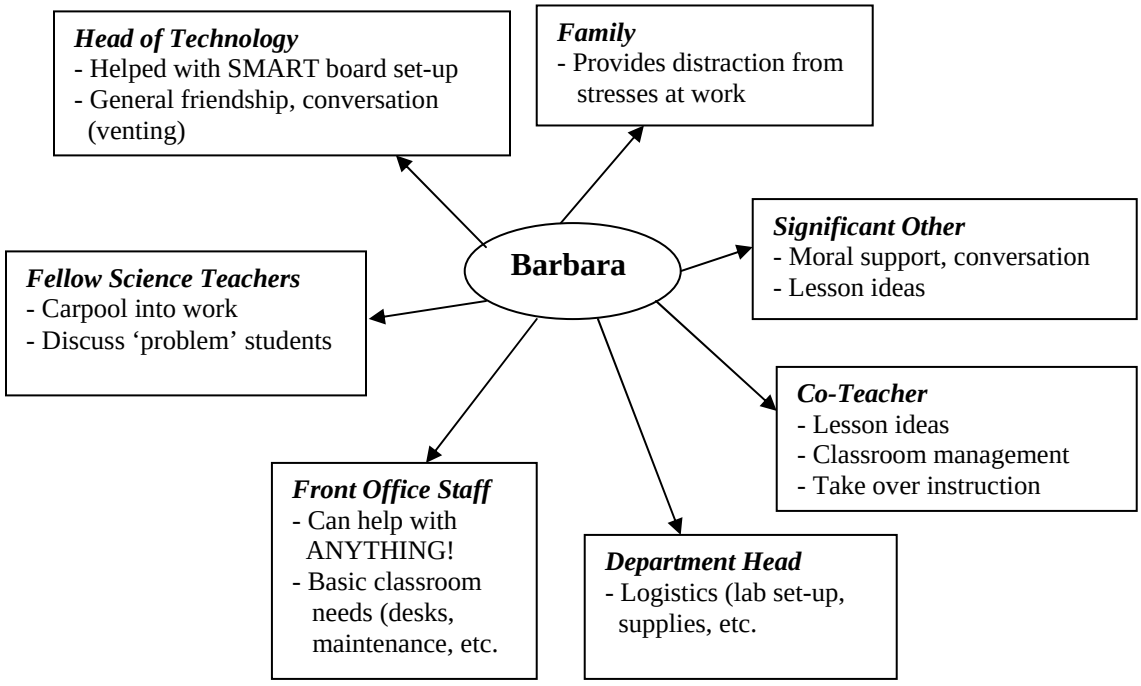

Figure 3. Barbara's Relational Map Year 1 (November, 2008).

Most often mentioned by Barbara when referring to people she turned to when in need of help was the inclusion teacher with whom she co-taught geology. Barbara described him during an initial interview in her first year of teaching as a person with whom she could exchange ideas and discuss effective teaching strategies. During her initial interview, Barbara also mentioned her

department head as acting as her logistics mentor and giving her guidance for material management and school protocol.

At the top of Figure 3, Barbara's family and significant other provide moral support and distractions from the stresses at work. Her dad lived down the street from her and she enjoyed relaxing with family and friends on the weekend. On the left side of the Figure 3, Barbara included her fellow science teachers that she carpooled with. The forty-minute ride to and from work each day was often spent discussing students, school procedures and teaching strategies. Barbara described the front office staff (bottom of Figure 3) as the go-to people for anything from classroom furniture and maintenance to help with completing forms and meeting due dates. The final member of her support team was the person in charge of technology hardware and software at the school. She considered him a friend and a good person with whom to discuss a wide-range of topics.

When Barbara entered her second year of teaching, there was a change in administration as well as teaching staff. The second figure reveals the resultant change in the type of support she was receiving. Barbara's first year diagram indicated the majority of individuals providing support with learners and learning. The diagram of her second year of teaching indicates individuals providing emotional support for a complex set of negative school issues. The oval in the center indicating Barbara is joined by two additional ovals: support with school issues and emotional support. Barbara's ovals signify herself and the two issues prominent in her second year of teaching. In the second year diagram, rectangles are used to indicate the individuals from whom she was receiving support. Although rectangles were also used in the first year diagram to indicate individuals, missing in the second diagram are the descriptions as to the type of support each individual offered. That information was later revealed during the interviews that followed

the drawing of the diagram. The first year diagram was more circular in nature the second year was more linear suggesting that school and emotional support were two separate matters with distinctively different support systems. The second year diagram is indicative of changes in risk factors and the resulting changes in the type of coping mechanisms employed by Barbara.

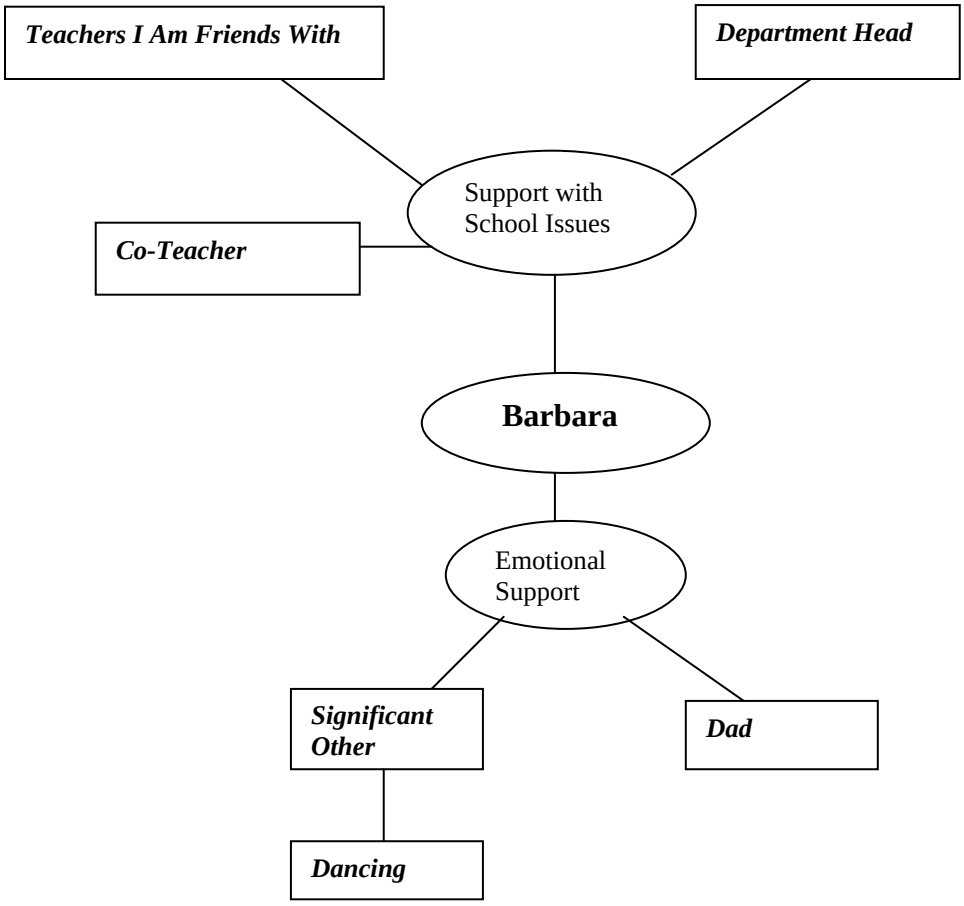

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Figure 4. Barbara's Relational Map Year 2 (March, 2010).

The top of Figure 4 indicated Barbara's need for support with mounting school issues. Neither the special education teacher for her inclusion class nor her department head was considered 'close' friends. She described her co-teacher as being less involved with the class during their second year together and her department head as having a very "short fuse and emanating a lot of negativity". However, she still turned to them for emotional support. The

bottom half of Figure 4 included only Barbara's significant other and her dad even though during an interview she mentioned friends that she went to dinner with or met for coffee after school hours. The linearity of figure 4 could possibly be an indication of her growing isolation as she struggled to complete her second year of teaching.

In response to the prompt on resiliency in nature (Email, April, 2009) Barbara offered her personal definition of resilience: *staying in this county!* (Interview #5, line 209). After a few minutes of laughter, she continued explaining that it comes down to being able to take a step back.

> *Not take the things that happen at school on a personal level and then just kind of step back and be objective and be able to reset the slate. And then go back in the next day, or the next whatever with the mindset that O.K. we're starting over again from the beginning* (interview #5, lines 214-217).

When describing a teacher she viewed as being resilient, Barbara spoke about the teacher who despite the school issues that had occurred, was determined to come back the following year. Barbara's words are an indication of her admiration for the teacher and perhaps sadness in deciding to not return a third year.

> *Well, of the four of us, he's the only one coming back. And just to hear him talk about the students it's so obvious that he's definitely coming back for the students. They are the reason he is coming back. The sole reason he's coming back, because he wants to see them through it. Which is admirable really. But I can't do it* (Interview #6, lines 512-515).

During the final interview Barbara was asked what relationship she saw between her resilience and staying in science teaching even though she chose to leave her school. She responded with, *Well I think if I were not resilient, this year would have done me in for sure* (Interview #6, line 418). She explained that she wanted to try another school before deciding to change professions. When probed further about her choice to leave her school but remain in the profession Barbara responded with,

> *Well because, way back when, when I was a Teacher's Assistant (TA)*[while attending college] *I remember how good it felt to talk about something that I just thought was so neat and interesting. And tell the students about it and have them think it was neat and interesting and learn something and see the light bulb moment* (Interview #6, lines 553-556).

Barbara experienced a wide range of risk factors between her first and second year of teaching resulting from contextual and professional factors. Accompanying those risk factors were changing protective factors as evidenced by her control of stress using palliative action and creating support systems to meet her changing needs. Barbara's choice to leave her school but remain in her profession is an indication of her resilience. Barbara had managed potentially negative effects of experiencing stressful work events and translated it into positive personal and professional resources from which she developed a positive professional life trajectory over the course of her career (Gu & Day, 2007).

Narrative 3: The Case of Linda

Context

Linda was a resilient and emotionally intelligent Caucasian married female in her mid-twenties with problem-solving strategies firmly in place and a boundless sense of optimism. Linda's student teaching as well as her first and second years of teaching was at a suburban high school situated just outside of the main merchandizing area of town. The school enrollment average was 1,470 students housed in a single building with several wings designated by content area. The student population consisted of 70% White, 17% Black, 7% Asian, 5% Hispanic and 1% Native American. A total of 37% of the student population received free or reduced lunch. The median household income served by the school system was $42,140 and the total per pupil expenditure was $8,575.

Linda had two days of orientation before preplanning began in her school. The first day was at the county office during which new teachers were welcomed to the school system and a brief overview of the school system was presented. The second day was spent in her own school where she was given a handbook that reviewed basic policies and procedures of the school. Novice teachers were also given a tour of the school, were introduced to their mentor teachers and were made aware of the functions of the Teacher Support Services (TSS). The primary mission of the TSS is to support hiring, assigning and retaining highly qualified teachers. Within Linda's school this also included assigning mentors to novice teachers. Linda was assigned a mentor that she had the opportunity to observe while a student teacher at the school. Linda's mentor taught chemistry, which at first was a good content match as Linda was hired to teach chemistry and anatomy. However, due to scheduling circumstances, Linda was reassigned to teach biology and anatomy but was not assigned a different mentor.

Case Findings-Themes

Linda's family history with the school in which she was teaching is a unique quality of this case. Linda's history with her school began two generation prior to her employment as a teacher when her grandparents and mother lived in the community and attended the same school. Living in the same community and completing her student teaching in the same school as the one attended by her provided Linda with three generations of school community knowledge before accepting the teaching position. In addition, both of Linda's parents worked as educators, giving her insight into the daily routine of a teacher.

Having three generations of family in her school community did not preclude Linda from experiencing stress during her first year of teaching. Risk factors included learning teaching strategies to meet the needs of her student population as well as learning how to organize her

planning time to create lessons and grade papers. Linda's most significant risk factor during her first year of teaching resulted from being a working mom and trying to juggle home and career. Linda commented that when she got home from work, family obligations took up most of her evening, so she rarely took schoolwork home with her. When demands from home and career did conflict and schedules or appointments needed adjusting, stress resulted.

Linda also found it difficult to transition from the classes she taught during student teaching to her classes as a first year teacher.

> *Last year I was in an eleventh grade honors class, and now I'm in a tenth grade regular class that's twice as big. So I have twice as many kids, they're younger, it's not the same level. . . So, I'm learning how to have all these classes, grade eighty papers every day, take kids out in the hall, discipline, detentions, writing people up. I didn't have to do that when I was a student teacher* (Interview #1, lines 36-42).

Linda encountered challenging student behavior during her first year of teaching. She explained that although student teaching helped with laying the ground work for developing teaching skills, there is always another teacher in the classroom with you that acts as a buffer between the student teacher and the student. This she noted was very different from having her own classroom and encountering the stress of having to learn different techniques to discipline students that included completing student write-ups and assigning detentions.

During Linda's first interview, she detailed some protective factors that were a direct result of being a part of her school community.

> *I'm perfectly happy. . . that's one of the main reasons I wanted to come back here was because I like the students and I like the faculty and I haven't met anyone that really scares me or hasn't been helpful. I really don't worry about anything because I'm sure that somebody will help me with it or if I have a question someone will answer it and not think, well she's real stupid. They're nice people here and they want to help* (Interview #1, lines 555-560).

Linda's comfort in her school environment gave rise to courage in reaching out to her co-workers for support. Unlike many novice teachers, Linda didn't worry about how or who to approach for help. She was confident that whatever risk factors she encountered, someone would be available to help her negotiate through those risks.

> *One of the reasons that I came to this school was because people were helpful. So pretty much if I have any questions, I can go to anybody and they'll tell me the answer or where to get it. I don't feel in any way isolated. That's one of the main reasons I wanted to work here is cause it's very community, family oriented* (Interview #2, lines 316-319).

As a married teacher with a child of her own, Linda delighted in the family atmosphere that was a part of her school climate.

Henderson and Milstein (2003) assert that all schools can be resiliency-building schools by having a supportive school community and positive school climate. Factors defining school climate include the characteristic of the school such as the physical structure of the school building and the interactions between students and teachers (Center for Research on School Safety, School Climate and Classroom Management from Georgia State University). It was the interactions between students and teachers that Linda focused on.

Much of Linda's second year as a novice teacher was spent focused on the student. Risk factors associated with understanding the learner and the learning environment resulted from Linda's determination to understand and meet the diverse needs of her students. One challenge to meeting her students' diverse needs was the lack of available science classrooms. Linda's first room assignment was in a non-science classroom in a wing of the building some distance from other science classrooms and science teachers. During the second semester of her first year of teaching, Linda spent time rotating through classrooms creating stress associated with continually moving materials into different classrooms.

> *Today I have taught three different rooms. First period I was in a completely different hall. Second period I planned in here while he* [referring to the teacher in the room] *taught. Third period I went across the hall because he was doing an experiment. And fourth period I was back in here. It's just three different rooms, three different set-ups* (Interview #3, lines120-124).

To counteract the stress resulting from changing classrooms Linda employed direct action (Pearlin & Schooler, 1982). Linda was very adept at identifying the problem and finding ways to change the situation from which the problem arose. She believed in directly addressing the cause and finding workable solutions. By directly addressing the classroom problem with her administrator, Linda was given her own classroom during her second year of teaching. When money was needed for supplies for the microbiology classes, she worked with another faculty member to write a grant. When she was uncertain about discipline issues, she contacted administrators or faculty personnel that helped her to understand what procedures to follow.

In addition to direct action and a helpful school community, Linda's broad science background provided her with confidence in her content knowledge in a wide range of science content areas. A broad science background protected her from risk factors associated with learning the content.

> *Maybe because I have a broad science background, I'm less nervous about what subject I'm teaching and more concerned with student behavior and figuring out how different students react. What's the best learning environment? What could you not allow? How can you get to them? How do you know they are actually getting the material* (Interview #4, lines 135-140)?

In addition, Linda fostered empathic relationships with members of her science department and used their common lunch to discuss content or student concerns.

Linda was an avid believer in asking for help. She considered this to be the most important thing for a new teacher to be able to do. Bobek (2002) states that new teachers enhance their resilience by fostering productive relationships with people who understand the challenges

that novice teachers face. Figure 5 is Linda's interpretation of the group of people she sought out to support her during her first year of teaching.

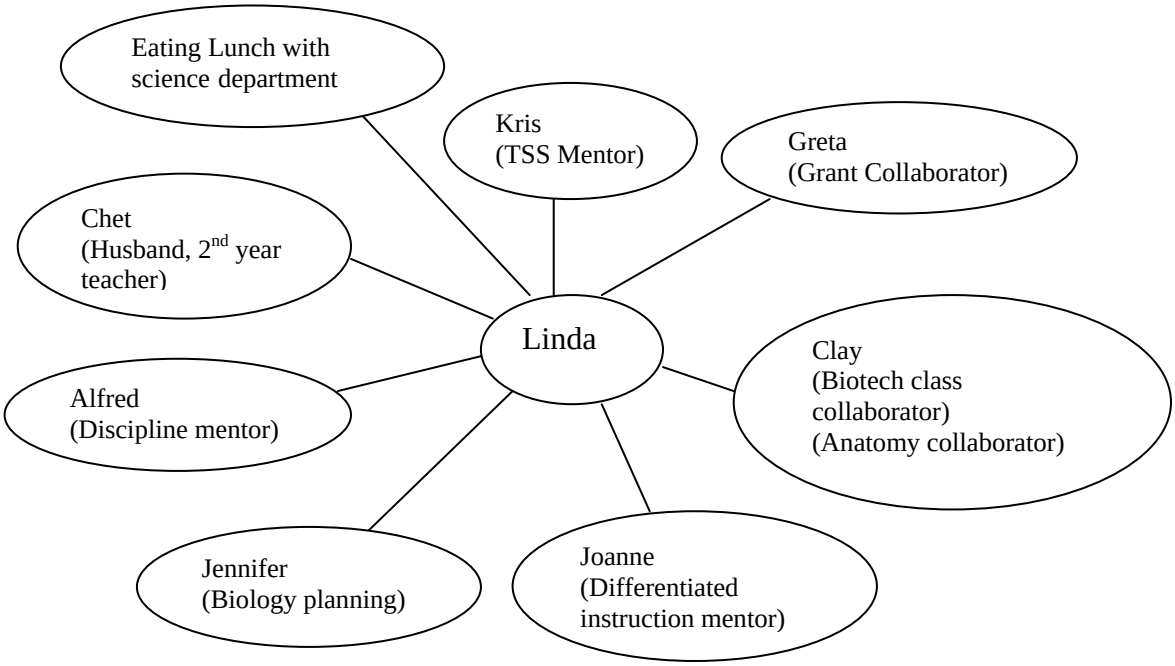

Figure 5. Linda's Relational Map Year 1 (November, 2008).

At the top of Figure 5 is Kris, Linda's TSS mentor that was assigned to her at the beginning of her first year of teaching. Linda consulted with her mentor for what she referred to as administrative stuff. *Where do I get this form? What do I do about this? What do I do about professional learning? How do I figure out professional administrative kind of stuff* (November 2008 interview)? To the right of Kris in Figure 5 is Greta, Linda's grant collaborator. Greta received a grant prior to Linda's first year of teaching for supplies for microbiology and suggested that Linda do one also so they would have a continuous source of money for supplies. Linda teams with Joanne (bottom of Figure 5). She is a special education teacher and they co-teach an inclusion class. They collaborated on a daily basis on how to differentiate the teaching for different learning styles and different life goals. Jennifer (bottom of the diagram) taught next

door to Linda. They planned their biology lessons and teaching strategies together and shared supplies and set-ups.

Alfred helped Linda with discipline. He had sixteen years of experience in middle school before teaching in the high school. Alfred approached Linda during her first year of teaching to see if she needed help dealing with student behavior. On the right side of Figure 5 is Clay. He worked on creating a biotech curriculum with Linda and is the department head. Together they worked on getting the biotech curriculum approved at the high school as a fourth science option. The department head usually conducted science meeting only once a month. Otherwise, the science department ate lunch together and discussed daily any questions or concerns that arose within the department. On the left side of Figure 5 is Chet, Linda's husband. Linda included her husband as part of her support system and a person she went to for advice. He was a second year teacher and coached the swim team at his school. A second diagram was not included for Linda. Problems during her pregnancy for her second child prompted her to take extended maternity leave and the researcher was unable to conduct the final two interviews.

Linda was a firm believer in having a multidimensional support system. She felt that having only one mentor was very limiting whereas having a multitude of mentors was enabling.

> *During your first year you need a whole bunch of different people helping you…Well, someone that has been teaching for a long time, someone that has been teaching for a short time, someone that teaches your subject, someone that teaches another subject. Just to give you different ideas about different things. You want to find yourself as a teacher and not just become a clone of another teacher* (Interview #3, lines 46-54).

Although most of Linda's first year supporters were centered on her science department, during her second year she expanded her support group to include co-workers throughout the school, thus reinforcing the notion that changing risk factors result in changing coping strategies.

In response to a prompt (Email, April, 2009), Linda shared her thoughts about factors that facilitated her resilience as a first year teacher. *I think a part of it is that I'm fairly stubborn and stubborn usually has a bad connotation whereas resilient has a good connotation, but really it's the same qualities* (Interview #3, lines 103-105). Linda equated stubbornness with resilience as she recalled incidents during her teenage years in which understanding math required a great deal of resilience coupled with a stubborn refusal to let go of preconceived ideas. In the literature stubbornness has a more rigid, inflexible connotation whereas resilience is defined by an individual's ability to be flexible. From Linda's perspective, stubbornness was a quality that helped an individual achieve a goal and whose success leads to becoming more resilient.

Linda advanced her notion of resilience in her description of the difference between resilient and non-resilient people and in so doing gave further insight into her own resilience.

> *I think too some people, one type of person, is the type that just accepts what they're given. And another type of person doesn't just accept. Is willing to say, Well why does it have to be that way? Can it be a different way? Can I do it this way? And I think I'm more of the second type. I don't just accept that it has to be a certain way. I think that certainly is resilient* (Interview #3, lines 115-119).

Linda experienced a change in risk factors between her first and second year of teaching. Accompanying the change in risk factors was a change in the protective factors as evidenced by her use of Pearlin and Schooler's direct action in dealing with the need for her own classroom and her continual addition of layers to her support system. In her final interview Linda talked about continuing to add to her support system in order to attain more insight toward becoming a better teacher. Her final comments suggested that she saw herself evolving over the period of this study and having her personal life closely intertwined with her school community encouraged opportunities for resilience building.

Narrative 4: The Case of Jennifer

Context

Jennifer was a resilient and enthusiastic Caucasian single female in her mid-twenties with a hardy personality and dynamic social competence. Jennifer's initial years of teaching were in a large suburban high school just outside of a major metropolitan area. The school's student enrollment averaged 2,522 students. The campus setting housed several buildings one of which was designated as the Freshman Academy in Jennifer's second year of teaching. The school's student population consists of 80% White, 8% Hispanic, 6% Asian, 3% Black, and 3% Native American. Only 8% of the student population received free or reduced lunch. The median household income was $72,331 and the total per pupil expenditure was $11,777.

Jennifer had three days of new teacher orientation. According to Brock and Grady (2006) orientation addresses issues critical to new teachers during the first part of the school year. The first day of Jennifer's orientation was for all new teachers in the county and time was spent learning about county policies and listening to various speakers. One topic discussed was the "Engage Me" program that offers suggestions for teachers to engage students, engage other teachers and engage parents in the learning process. The final day of orientation Jennifer reported to her school and was introduced to administrators and faculty. Jennifer also met first with the science department and later with biology teachers during which she was given a syllabus and curriculum map to help guide lesson planning and pacing.

Jennifer was assigned a mentor at the start of her first year however Jennifer found it difficult to meet with her assigned mentor for several reasons. First, as head of the science department, her mentor had many demands on her time. Second, Jennifer's mentor taught a different content area and had classes in a different hall. She was also a single mom with two

children, so time and proximity became an issue when trying to meet. For those reasons, Jennifer opted to adopt Amy, the teacher who taught in the classroom next to her as her primary mentor. Describing her alliance with Jennifer, Amy portrayed a mutually empathic relationship. They shared materials, teaching strategies and survival techniques. Amy depicted what she considered to be a good mentor-mentee relationship as one in which you identify with the person.

> *In order to really be a mentor for someone you also have to identify with them on a personal level. And if you are assigned to just some random mentor that you have never met before, you have no idea if you are going to be able to identify with them. And so if you don't identify with them and you don't have much in common it is really going to be hard to mentor them or give them advice that they can actually use* (Mentor Interview, Spring 2009, lines 102-106).

Mentoring facilitates the professional growth of novice teachers and is also seen as a means of helping novice teachers develop self-reliance and accountability a well as reciprocal relationship benefiting both mentor and mentee (Koballa & Bradbury, 2009).

Case Findings-Themes

The uniqueness of Jennifer's case is the result of her ***hardiness***. "Hardy persons have considerable curiosity and tend to find their experience interesting and meaningful. Further, they believe they can be influential through what they imagine, say, and do. At the same time, they expect change to be the norm, and regard it as an important stimulus to development" (Kobasa, Maddi, & Courington, 1981, p. 368). Jennifer's hardiness is evidenced early in her teaching career. Shortly after accepting her new teaching position, Jennifer was contacted by the head of the English to Speakers of Other Languages (ESOL) department to see if she was interested in teaching ESOL biology classes. The stress of beginning a new career and taking on ESOL learners prompted Jennifer to take direct action. Jennifer accepted the position with a positive view of what the future would hold and the flexibility to accommodate change, factors that are characteristic of resilient individuals.

To further deal with the stress during her first year of teaching Jennifer enrolled in the Sheltered Instruction Observation Protocol (SIOP) training and ESOL conferences to better prepare to teach biology to ESOL students. Later in the school year when asked if she was enjoying her ESOL biology classes she responded, *I love it. If I could do that all day, I'd do that all day* (Interview #6, line 570). Jennifer's willingness to jump in and try new challenges proved to be a successful and enjoyable choice in her first year of teaching. Jennifer's hardiness during her first year of teaching was underlined by her willingness to volunteer for extra-curricular activities and take on additional learning for her ESOL classes. Jennifer was also the first teacher in her school to work with the new white boards that were installed in the classrooms and the first to learn to test using the new EDUSOL software program.

Other risk factors Jennifer encountered during her first year of teaching included such things as working in a non-science classroom and assisting Sara with coaching the cheerleading team. Although Jennifer had to modify some of her lessons and labs to fit her environment, she said it was not a difficult adjustment. In the same sense, Jennifer found that helping Sara coach the cheerleading team was a good way to get to know students and parents during her first year of teaching. Keeping track of the vast amount of paperwork she handled throughout the day was a stressor that Jennifer struggled with during both her first and second year of teaching. This stressor was compounded by the difficulty she experienced in organizing classroom materials, deadline schedules and mandatory paperwork. Her response to this stressor was to control the meaning of the stress by realizing that this was something that would always be a part of her (Pearlin & Schooler, 1982).

> *I guess I'm just learning to live with it. I've learned that I'm going to take an extra five minutes to find something when someone asks for it. I do a lot of wandering around the room looking for stuff. I probably waist a little bit of time*

> *in class that I shouldn't but I've just never been that type of person* [referring to someone organized] (Interview #6, lines 581-585).

During her second year, Jennifer's vision of teaching changed. She was angry about what she considered unfair treatment of novice female teachers without children.

> *Stuff I don't get paid for irritates me and is stressful to me. Everything outside of what I consider my job that they* [administrators] *make you do. All the extra crap* [referring to extra-curricular activities] *that they make you do. That stresses me out. I feel like I can't get my grading done because I have this practice or this club or that, you know. And they always ask the same people to do it and it's always the young female teachers that don't have any kids. And that stresses me out*. (Interview #5, lines 145-149).

Kyriacou (2001) argues that stress can result from work as a teacher and lead to unpleasant feelings involving anger, tension and frustration.

In addition to professional stressors, Jennifer also had two personal stressors during her second year of teaching. The first was when she learned that her mother was diagnosed with cancer. Because she was coaching the dance team and coaching cheerleading during her second year of teaching, Jennifer was unable to travel home to support her mom. *If we have Saturday games then I can't go home for the entire season to see my parents because they live five hours from here* (Interview #5, lines 331-332). Frustration with the politics of the profession, cited by Brock and Grady (2006) was one reason why a novice teacher's outlook can change from one of optimism to a more pessimistic vision. The second personal stressor for Jennifer was trying to plan for her upcoming wedding in June in addition to moving to a different location. To counteract stressors, Jennifer used palliative action. Kyriacou states that teachers' attempts to cope with stress can fall into the category of palliative (reduces the impact of the stressor) or direct action (eliminates the stressor). Jennifer's palliative techniques included origami and doing puzzles. Jennifer also enjoyed reading because she said that by reading *I feel like I can escape realities* (Interview #5, lines 182-183).

Receiving support from colleagues was the foundation of Jennifer' resilience. Judith Jordan (1992) saw resilience as a relational dynamic with movement toward empathic mutuality. She suggested that through mutual empathy, disconnected people could be brought back into a place of connection where healthy psychological growth can occur. The diagram below is Jennifer's interpretation of the group of people she sought out to support her during her initial year of teaching. She starred those people she considered to be most significant in her support group and used purple to signify the importance of her relationship with Sara. The ovals signify the people in her support group and the squares indicate the type of support that was offered.

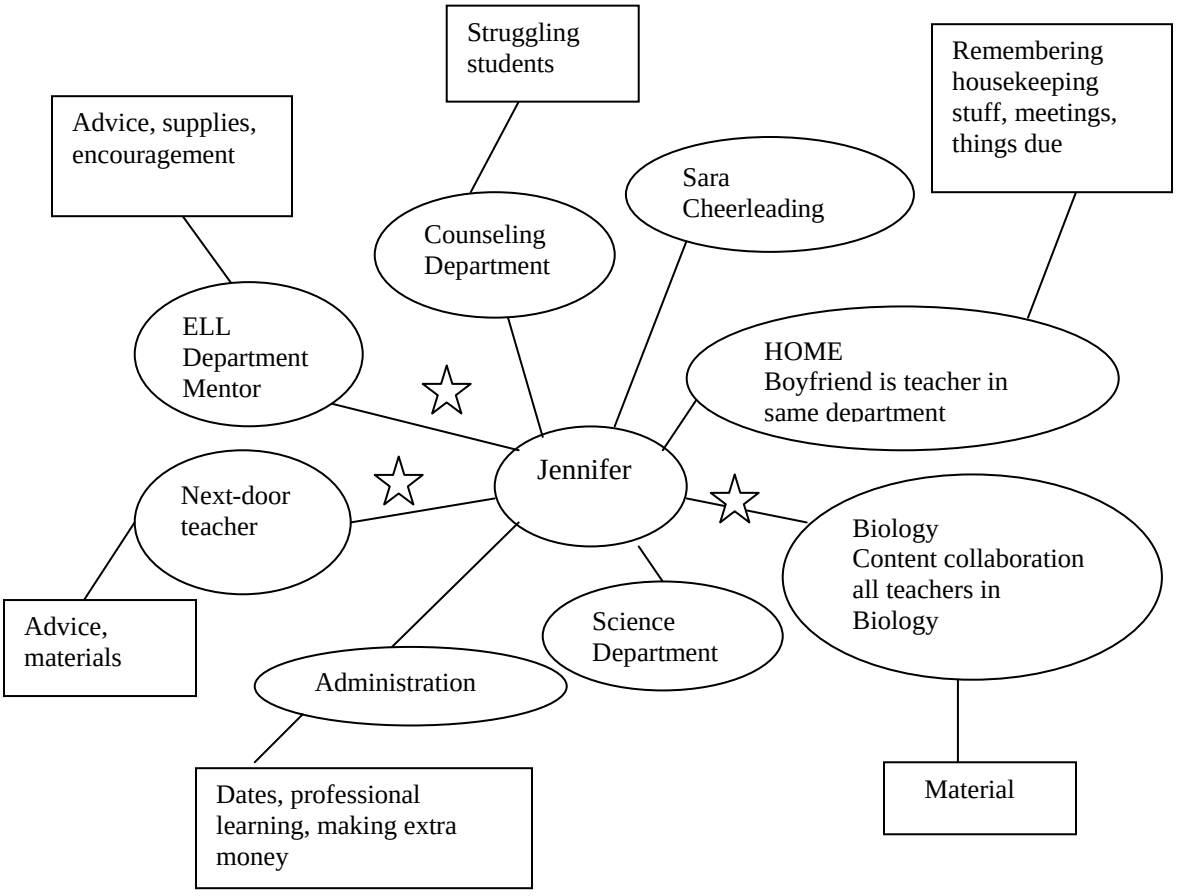

Figure 6. Jennifer's Relational Map Year 1 (November, 2008).

On the left side of Figure 6, Jennifer described the ESOL department head that helped her with strategies to employ when she began to teach her initial ESOL classes. Although not

officially assigned as her mentor, Jennifer turned to Ms. Bee for advice with both her sheltered (ESOL) and regular biology classes. Jennifer also considered some administrators as a 'type of mentor' when they sent emails to remind teachers of deadlines, an organizational skill that Jennifer struggled with during her initial year of teaching. The teacher next door (Amy, left side of diagram) became Jennifer's adopted mentor during her first year of teaching. She gave Jennifer advice on content and what she considered the best way to deliver a lesson to the students.

At the bottom of Figure 6 is the biology content group, which met two mornings a month to check the pacing and content being taught and exchange lessons, teaching strategies and equipment. Above that to the right of Figure 6 is Jennifer's fiancée. Michael helps Jennifer to stay organized, a challenge that Jennifer struggled with throughout her initial year of teaching and one that often caused her stress. He also reminds Jennifer if she has a meeting or paperwork due. She in turn reminds him when report cards are due and when he has scheduled meetings. At the top of Figure 6 is Sara, Jennifer's friend as well as co-worker. Jennifer is assistant coach to Sara for cheerleading. They attended the same university together and had some of the same methods classes. Since they both teach biology, they share lessons and materials and collaborate on future lessons during their planning periods. Jennifer and Sara also give each other moral support by using each other to vent when stressed and socialize outside of school.

Jennifer's diagram of her support system during her second year of teaching was not as elaborate as her first. There were no stars or explanations of what each person connected to Jennifer did. Instead, Jennifer chose to use only ovals to indicate relationship between herself and different support groups connected to her.

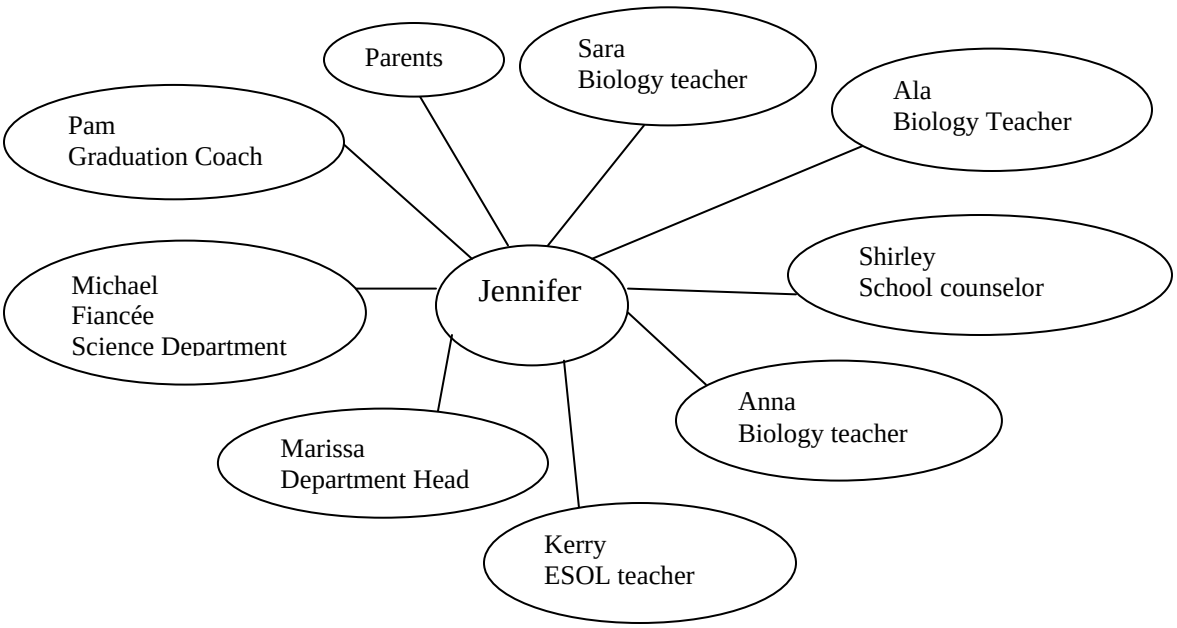

Figure 7. Jennifer's Relational Map Year 2 (April, 2010).

Unlike her first year diagram, this does not contain administration as part of her support structure. In her second year of teaching Jennifer perceived her administration as sending mixed messages as to their expectations and Jennifer found this to be confusing. Rather than include her Science Department, biology content collaboration team, and counseling department as she did in her first diagram, she chose instead to specifically name each co-worker that she relied on most. This may indicate a change from her first year where Jennifer perceived everyone as potential support but was now more specific in the connections she made. She does not describe what each individual offers in the way of support but rather, takes a more holistic approach by talking about mutual collaboration among friends and co-workers. Jennifer spoke of having a better relationship with the counselor this year. One of the reasons is that the counselor joined Jennifer's lunch group and was available to discuss concerns on a daily basis. The counselor was also located in the Freshman Academy building with Jennifer. Michael and Jennifer are engaged

to be married in June 2010 and rely on each other for reminders about meetings and deadlines as well as moral support.

In response to a prompt (Email, April, 2009) Jennifer shared her thoughts on resilience.

> *Well I guess resilience would be not going home and crying every day (laughter during interview). Not crying when I grade papers. And I guess maybe staying positive and being able to still enjoy your job despite all the other crap you have to deal with...and then coming back every year. Not quitting in the middle of the year* (Interview #5, lines 20-30).

When asked to describe a teacher in her school that she viewed as resilient, Jennifer described a veteran teacher who was positive in her attitude toward students and her career as a whole. She also indicated that those teachers who had children of their own were better able to understand parents and ways to approach sensitive subjects concerning their children. In her final interview Jennifer was asked to describe the relationship she saw between her resilience and staying in the science teaching profession. *I know teaching is stressful so I guess if you're able to focus on the positive things then I guess being able to not be stressed out would help me stay in the teaching profession* (Interview #6, lines 124-126).

Jennifer experienced a major change in the level of stress and stressors between her first and second year of teaching. This change was a result of the change in personal and professional factors. Family wellness issues encountered during her second year of teaching were compounded by administrative demands for additional volunteer time. Jennifer's protective factor changed between her first and second year of teaching to match her changing risk factors. Palliative action in the form of reading and creating origami were employed to manage stress. Jennifer's ability to counteract risk factors in her early teaching career enabled her to build her resilience as a novice secondary science teacher.

CHAPTER 5

CROSS CASE ANALYSIS

Introduction

The four narratives presented in Chapter 4 described the individual cases of Sara, Barbara, Linda and Jennifer in relation to being resilient novice secondary science teachers. Narratives were developed around emerging themes that illustrated the uniqueness of each case. The intent of this chapter is to build on the discussion of the individual cases and provide an analysis across the four cases. A detailed discussion of common themes that emerged across the four individual cases helped to illuminate factors that affected the resilience process in the novice secondary science teachers.

The cross-case analysis is based on two considerations: the research questions posed at the beginning of the study and the resilience process framework. As previously presented, this study aimed to explore resilience in novice secondary science teachers. The study sought to find answers to:

1. What are the risk factors faced by novice secondary science teachers identified as resilient?
2. What protective factors do resilient teachers employ?
3. How do risk factors and protective factors facilitate the resilience process?

Cross case analysis provided the primary themes of risk factors and protective factors for the development of the resilience framework. The framework evolved as data was analyzed throughout this two-year study. Findings central to the resilience framework supported the notion

that the interactions between risk and protective factors constitute the driving force of the resilience process and stimulate responses to help counteract negative effects of stress. Therefore, as suggested in the process framework, resilient individuals develop as a result of exposure to a significant adversity and the use of protective factors to counteract that adversity. Unique to the PROF is the fact that emergent data was the basis for the development of the framework and the framework itself was used to develop the data.

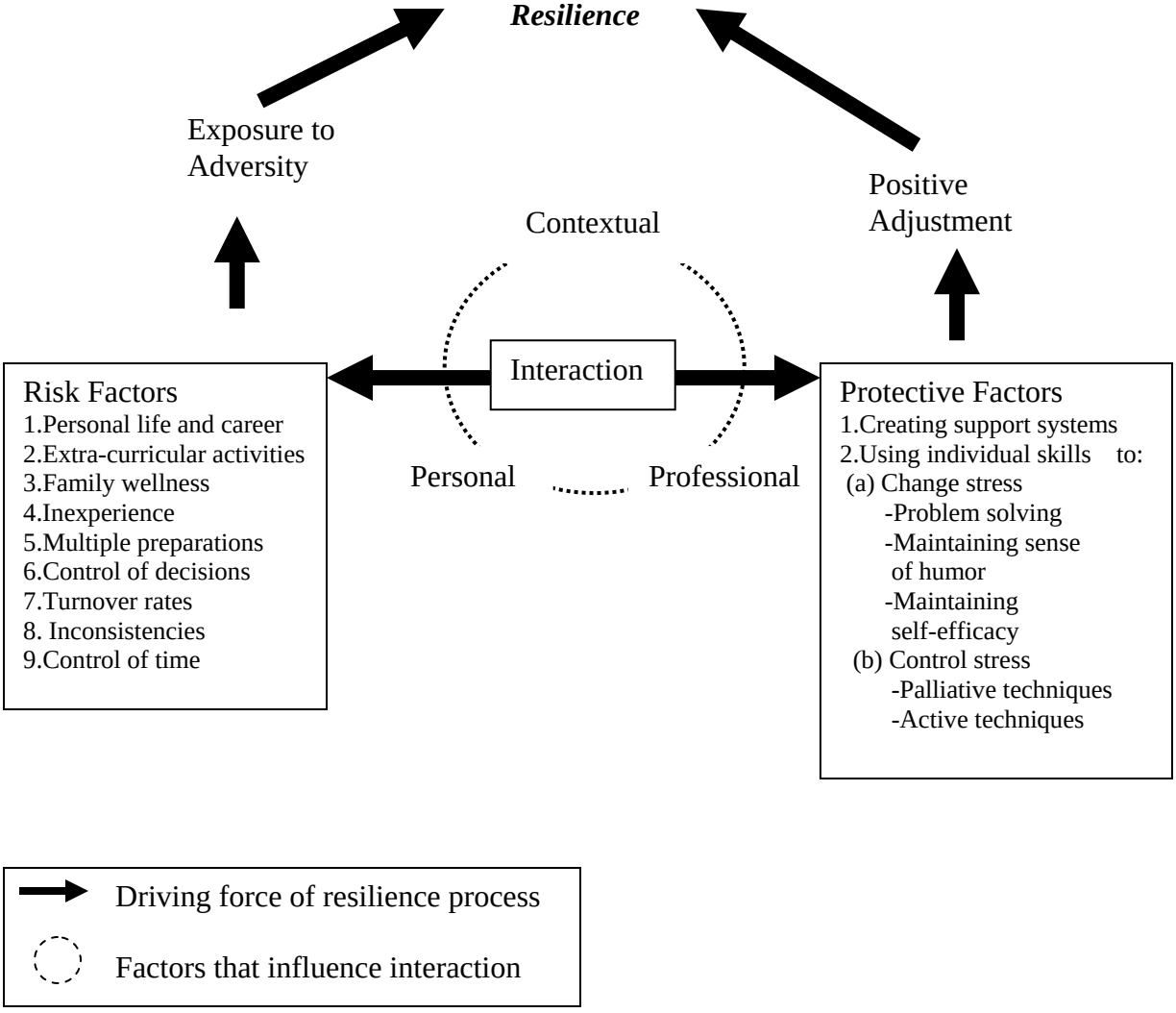

Figure 8. Process framework (PROF).

Risk factors and protective factors set the parameters for the process framework and are the driving force of the resilience process. Data revealed eight risk factors, which led to negative outcomes in the novice secondary science teachers and resulted in stress. Analysis also revealed that negative outcomes can be moderated by protective factors and can lead to positive adjustments. Protective factors were revealed through the data to be either internal or external in nature. Growth-fostering empathic relationships are external protective factors while individual abilities such as flexibility and the ability to problem solve are internal in nature. Strategies used to cope with negative outcomes can deal directly with stresses or can moderate the negative effects of stress through use of more palliative actions such as relaxation techniques or joining sports groups.

The resilience framework that emerged from the data further served as a means to answer the research questions in a meaningful way. Using this framework, themes are organized based on the research questions. This framework is further elaborated in the following sections.

Risk Factors Faced by Novice Secondary Science Teachers

Risk factors refer to an event or experience that can be expected to cause stress in many people. It carries the potential for interfering with normal functioning (Masten, 1994). For teachers, stress is the result of a complex web of interacting factors. Kyriacou and Sutcliffe (1978a) viewed teacher stress as a negative emotional experience triggered by the teacher's perception that her school-based situation represented a threat to her wellbeing. Numerous studies have been conducted in various countries concerning teacher stress; for example, Kyriacou (2001); Kyriacou and Sutcliffe (1978b) in the U.K.; Tellenback, Bresser, and Lofgren, (1983) in Sweden; Solman and Feld (1989); and Howard and Johnson (2004) in Australia.

Results on teacher stress are consistent with results from life stress research that posits that stress can have a negative effect on an individual's health and wellbeing (Taylor, 1991).

As a driving force in the process framework (PROF), risk factors are predictive of negative outcomes. The *pull between personal life and career* was a prominent risk factor for teachers. During the early career stage it is often difficult to balance responsibilities for teaching with having a personal life. When life-altering events occur like marriage, divorce or the birth of a child during the initial years of teaching stress is even more paramount. Sara and Jennifer incurred the stress of planning their weddings while trying to survive their initial years of teaching; Sara's during her first year and Jennifer during her second year of teaching. Linda became pregnant with her second child during her second year of teaching. Her pregnancy was a difficult one and caused her to take an extended medical leave.

Volunteering for extra-curricular activities was a second risk factor that created stress for the novice teachers. Extra-curricular activities although voluntary were often an expectation of the school that required more time than the novice teachers originally assumed that it would. For example, Sara and Jennifer volunteered to coach cheerleading and dance squad. Even though voluntary in nature, stress resulted from the amount of unexpected time that the events took including time after school and weekends in which school events were scheduled, taking time from family and friends. Barbara also mentioned during the interviews in her second year of teaching that her work with Science Olympiad was more involved than she anticipated and took more time than she originally planned, creating stress from the pull between personal life and career.

Family wellness, a third risk factor, was also a source of stress for participants trying to devote time to both family and career. Family wellness affects spanned both short and long

periods of time. For example, stress related to illness from a long-term disease such as cancer in Jennifer's mother created ongoing stress related to trying to devote time to both her mother and her career. Family wellness related to minor injuries tended to be more short-term as exemplified in the incident where Linda's daughter fell and needed stitches, requiring Linda to abruptly leave school and take her daughter to the hospital emergency room.

A fourth risk factor, *Inexperience in dealing with low-achieving students,* resulted in stress for the novice teachers. Barbara and Sara felt unprepared in trying to deal with the many needs of their diverse student population both academically and with issues concerning student behavior. During interviews in their second year of teaching they spoke of student discipline issues, student apathy and student absences with their groups of low-achieving students as a cause of stress. Matters were made worse by the fact that Barbara and Sara were teaching in an area outside of their area of content preparation and additional stress resulted from trying to understand the content and locate materials with which to conduct appropriate laboratory activities.

Data collected during the study also revealed that *having multiple preparations* was a fifth risk factor for the teachers. Paperwork for reading and grading papers, finding resources and planning lessons resulted in stress related to time spent after school and on weekends. Teachers often began their school day an hour before students arrived and remained after school into the early evening hours. Unable to complete planning within school hours often required teachers to take work home nights and on weekends. Barbara, Sara, and Jennifer often designated Sunday night as their time to get caught up on schoolwork and plan for the upcoming week creating stress between time spent on their career and time devoted to their personal lives.

A sixth risk factor involved the *Lack of control over decisions concerning teaching space*. Being assigned to a non-science classrooms or being assigned as a floater between several classrooms, caused stress in the novice science teachers. Sara, Jennifer, Linda and Barbara were assigned non-science classroom during their first year of teaching. During the second semester of her first year, Linda was moved from her non-science classroom and was assigned to be a floater between three classrooms creating stress resulting from the teacher's constant movement of materials that accompanied each classroom change.

High turnover rates for faculty and administrators, was the seventh risk factor that emerged from the data. This was most evident in Barbara's case. The resulting lack of communication between administrators and faculty due to the constant change in personnel led to suspicions and distrust of administrative decisions. Frequent changes in personnel precipitated school changes that Barbara found stressful to deal with. In the same sense, *inconsistent application of the school discipline code* was a risk factor experienced across the four cases. Inconsistency in Barbara's school was the direct result of the frequent change in administrators. For Sara and Jennifer inconsistency in application of the discipline code resulted in stress from not understanding when rules applied and to what extent they applied.

A final risk factor was *control of time* with the greatest stress resulting from the loss of planning time or an unexpected change in schedule. Barbara experienced recurrent changes in schedules and loss of planning time. Stress resulted from trying to make up the lost time with her students and find time to read and grade their papers. In Sara and Jennifer's case lost planning time was particularly stressful when the loss coincided with long hours of extra-curricular activities after school.

Protective Factors Employed by Resilient Teachers

The term protective factors, is used in this context as a generic form for moderators of risk and adversity that enhance good (Werner, 2000). It is what individuals do to avoid being harmed by life stressors and is inseparable from the risk factors individuals experience and the individual's personality (Pearlin & Schooler, 1978). As noted in the PROF risk factors contribute to psychological distress while protective factors moderate the effects of adversity (Benard, 2004). In order to understand protective factors, it is necessary to examine the choices of protective factors made in this study in the context of the risk factors experienced by the novice secondary science teachers. Pearlin and Schooler (1978) suggest "Coping responses represent some of the things that people do, their concrete efforts to deal with the life-strains they encounter in their different roles" (p. 5). Findings from this study suggest that the novice science teachers utilized a variety of protective factors within the context of risk factors and these protective factors assisted the novice teachers in building their resilience.

Thematic examination suggested two major categories of protective factors most often employed by the novice secondary science teachers which align with the risk factors mentioned in the previous section: *creating support systems of empathic relationships,* which is external in nature*; and using individual skills to change or control the stress,* which is internal in nature.

The novice science teachers relied most frequently on creating support systems that emphasized empathic relationships. Jordan (2006a) maintains that growth-fostering connections are characterized by three factors: mutuality, empowerment and development of courage. Mutuality in all four participants involved both the giving and receiving of support. During the first year of teaching, this protective factor was used primarily to address risk factors associated with understanding content. During the second year of teaching, this protective factor was

primarily used to address risk factors associated with inexperience in dealing with low-achieving students, teaching in content areas outside of their area of content preparation and stress brought on by family wellness.

As evidenced in their lunchtime meetings, the four teachers both gave support and received support. Asking for and receiving help in science content or student behavior was as much a part of the lunch time discussions as was asking for and receiving help in wedding planning or finding new techniques for hobbies. Jordan argued that the core of relational resilience is the movement towards mutuality. “The importance of these relationships is not just that they offer support, but that they also provide an opportunity to participate in a relationship that is growth-fostering for the other person as well as for themselves” (Jordan, 2006a, p. 88). Jordan posits that mutuality is difficult to achieve because it is predicated on tolerating uncertainty, complexity, and vulnerability with emphasis placed on growth for those involved in the relationship.

Far from seeming difficult, in this study the novice secondary science teachers relished the opportunity to learn and grow from contact and collaboration with co-workers, friends and family. They openly used expressions of need when faced with risk factors such as teaching subject areas with which they had limited experience or personal stressors such as Sara’s divorce. They were adept at picking up signals of stress from other novice teachers and encouraging them to be a part of lunchtime meetings or professional collaborations. It was during the times of isolation that the four teachers felt most vulnerable and only through connection with their empathic relations did the participants feel personal and professional support (Le Cornu, 2007).

Empowerment resulted from the mutual relationships that acted as protective factors to counteract feelings of isolation. Empowerment for the participants was manifested in other protective factors such as positive attitudes, flexibility and belief that they were good at their job. Although teaching ESOL was new to Jennifer and was a source of stress, she entered into her first year of teaching with a positive attitude, open to suggestions, flexible in her thinking and willing to engage in additional professional development in order to develop skills necessary to teach ESOL classes. The more she learned, the more empowered she felt to effectively teach her students. Empowerment is what enabled Sara and Barbara to try new teaching strategies with their low-achieving students and institute behavior modifications for difficult student behaviors. Barbara joined a chemistry learning-community to counteract the stress of teaching a subject with which she was unfamiliar. The learning community helped her with teaching strategies and content knowledge. With empowerment came the protective factor of courage to reach out to form new relationships and gather new resources. The cycle of mutuality, empowerment and courage were a significant part of the resilience process of overcoming adversity through the use of protective factors in the novice science teachers.

As noted in the PROF novice secondary science teachers also employed individual skills as protective factors. Those skills included problem solving, maintaining a sense of purpose, having a sense of humor and maintaining self-efficacy to counteract stress. This also required flexibility in applying the outcomes. For example, Jennifer had a successful first year as an ESOL teacher because she was flexible in choosing to undertake professional development and enacting suggestions made by her ESOL mentor. In each of the individuals, matching risk factors to appropriate protective factors and being flexible to make changes that led to positive outcomes helped to build resilience. In the 3Rs project conducted by Cogan and Subotnik (2006), findings

suggested that one of the strongest predictors of resilience was the logical and thoughtful approach to solving problems.

It was strongly stated by the participants that teaching is what gave meaning to their lives despite risk factors involved with being a teacher. Individual skills such as their sense of purpose and self-efficacy acted as primary protective factors that enabled them to persist when risk factors seemed overwhelming. During interviews Linda often commented that her focus remained on what was best for the students even when that meant going outside of her building to collaborate with a local college. When Linda saw an opportunity to extend her students' learning environment, she worked with a local college to add a science course to the curriculum. Barbara also spoke of her sense of purpose in teaching science to students who thought they could never be successful in a science class and the great joy it brought her to see them succeed. During both her first and second year of teaching Jennifer attended ESOL professional development to gain a better understanding of ESOL strategies to use with her students and develop her individual skills. Sara employed skills with technology hardware and software to enhance her students' learning. Many of the projects created by her students were uploaded online for public viewing as well as incorporated into their college resumes.

Participants also used humor in the classroom. This protective factor was used to motivate students to learn. Sara often wove what she termed 'corny jokes' into her lectures. She commented that many apathetic students listened more intently, waiting for the jokes to emerge. Jennifer was able to control the meaning of stressful experiences related to her struggle with organizational skills throughout her initial years of teaching by resigning herself to the fact that this was a part of her personality. Rather than try to change her personality, she chose to find ways to create small pockets of organization within her classroom and her personal life that

enabled her to accomplish mandatory tasks. “A teacher’s resilience is enhanced when he is capable of assessing adverse situations, recognizing options of coping, and arriving at appropriate resolutions” (Bobek, 2002, p. 202). Across the cases, the four teachers used their individual skills to address personal and professional risk factors.

As noted in the process framework, strategies used to buffer and manage the stress took the form of direct and/or palliative action. Direct action was used by the teachers to eliminate sources of stress i.e. in this study, Barbara’s unfavorable evaluation that she had eliminated from her personnel folder by speaking directly to the assistant superintendent. Jennifer’s family wellness stress was handled through direct action of conference calls with her family and home visits when her commitment to extra-curricular activities ended. Counteracting the risk factors of multiple preparations and the accompanying paperwork of reading and grading papers, was accomplished by the four participants by directly attacking the problem through organizing and prioritizing their time.

Palliative techniques do not deal with the source of the stress, but rather focused on the reduction of the feelings of stress from those sources (Kyriacou, 2001). For example, Barbara utilized ballroom dancing to counteract stress from student discipline issues and stress resulting from high administrative and faculty turnover rates. Jennifer employed origami, reading and deep breathing exercises to counteract stress incurred from planning a wedding, dealing with her mother’s illness and stress brought on by her involvement in extra-curricular activities. Sara’s decision to join a softball team and take painting classes helped her deal with stress related to extra-curricular activities, a divorce during her second year of teaching and teaching in an area outside of her area of content preparation. Barbara, Jennifer, and Sara described the importance of engaging in these palliative techniques as having a calming effect and a way of relieving

tension. Howard and Johnson (2004) noted that teachers, who do cope with stress through palliative action, realize success as an individual disposition or strength that is bolstered by regular exercise, hobbies and relaxation techniques.

Findings in this study revealed that the participants employed both individual skills and fostering relationships as protective factors to counteract risk factors encountered in their initial years of teaching. Direct action was used to change the risk factors. Palliative techniques were strategies used to buffer stress resulting from negative outcomes.

How do Risk Factors and Protective Factors Facilitate the Resilience Process?

Masten (2001) asserted, "Resilience appears to be a common phenomenon that results in most cases from operation of basic human adaptation systems. Those adaptation systems are characterized by good outcomes in spite of serious threats to adaptation or development" (pp. 227-228). Four concepts have emerged as a result of this research that are instrumental in determining the final research question. The first is that individuals are considered resilient only if there has been a significant threat to their development. They must have encountered current or past risk factors. The hallmarks of being resilient include the ability to solve problems or having significant growth-fostering relationships.

A second notion is that the four participants encountered both personal and professional risk factors that changed between their first and second year of teaching. It is reasonable to assume that circumstances change over time. Therefore, risk factors associated with those changing circumstances will also change. A third notion posits that protective factors also changed in accordance with the changing risk factors between year one and year two of the participants' initial teaching years. The process framework (PROF) indicates that negative

outcomes are moderated by protective factors and therefore, those protective factors must change to counteract new risk factors.

A final concept is that the interaction between risk factors and protective factors act as a primary force in the resilience process and stimulate responses to help fight off negative effects of stress. Noted in the PROF is that the complexity of interactions occur within the boundaries of contextual, personal and professional factors. Interactions take place over time and are affected by multiple combinations of protective factors and strategies that build resilience in novice secondary science teachers.

Literature on the resilience process indicates that exposure to a significant threat and the achievement of positive adaptation, are a necessary part of building resilience (Luthar et al., 2000; Masten et al., 1990; Rutter 1990; Werner & Smith, 1982). The four participants in this study were exposed to significant adversity resulting in both personal and professional risk factors, which changed between their first and second years of teaching as evidenced in the previous two sections. Focusing on how those risk factors changed and how their accompanying protective factors also changed provided a means by which to address how these two notions facilitated the resilience process.

Primary risk factors encountered during the participants' first year were the *lack of control over decisions concerning teaching space and inexperience in dealing with low achieving students.* Across the four cases the participants were assigned non-science classrooms and struggled with stress resulting from challenges to understanding how to create effective instruction in non-science classrooms. Protective factors that helped to counteract the stress of being in a non-science classroom most often employed by the novice secondary science teachers during their first year of teaching was the creation and use of a support group through which

empathic relationships were established. Through these relationships, the four participants learned techniques for designing successful lessons and labs for the area in which they were teaching. The four participants also employed their *support systems as a protective factor* to counteract the stress of inexperience in dealing with low-achieving students and understanding effective teaching strategies. Each support person in the support systems they created was added to help with their specific content areas and student concerns. Risk factors though few in number during their first year of teaching, matched protective factors to create successful resilience building.

During their second year of teaching risk factors changed significantly. Barbara and Sara were teaching courses outside of their area of content preparation and stress resulted from trying to understand the content and find materials and people to support their efforts. Additional professional stress experienced by Barbara, Sara and Linda resulted from having multiple classroom preparations. Protective factors changed to counteract the professional risk factors incurred during the participants' second year of teaching.

Data from this study show that it is not just any protective factors that create an effective resilience process, but rather, a match in degree and type of protective factor with the degree and type of stress that allows for a positive outcome and a building of resilience. For example, to counteract the stress experienced from teaching outside their known content areas, the two participants sought out additional people to add to their support systems to help with content and teaching strategies. Noted is the fact that the people in their support systems from the year before were not experienced in the content they were teaching during their second year and a new match had to be made. Having multiple classroom preparations also caused Barbara, Sara and Linda to employ protective factors involving individual skills such as problem solving in order to

effectively counteract the stress. This was evident in their ability to diagnose the stress associated with multiple classroom preparations and employ specific supporters and organizational skills to counteract the resulting stress. Again, by effectively matching individual skill to a specific risk factor, successful outcomes resulted.

Family wellness was also a source of stress across the four cases during their second year of teaching as well as stress related to extra-curricular activities. Since family wellness was not an issue during their first year of teaching Linda, Sara and Jennifer did not have prior protective factors established. In this case, all three participants relied on direct action as well as new support people as protective factors in dealing with family wellness issues. Extra-curricular activities, often time consuming, caused additional stress for the participants especially if activities conflicted with family wellness issues. The three teachers matched direct action, problem solving techniques and their support systems with these risk factors. More specifically, Sara sought assistance from Jennifer for working with her cheerleading teams. She chose Jennifer because of her experience with coaching the dance team. Jennifer sought help from family and medical personnel when dealing with her mother's cancer and help from Sara when coaching her dance team. Linda employed her support team when she had to abruptly leave school to tend to her daughter's accident and again when she went on medical leave due to a difficult pregnancy. These three teachers appropriately matched their protective factor with the risk factors during their second year of teaching to build resilience.

In dealing with student apathy, student behavior problems and challenges resulting from inexperience in dealing with low-achieving students, Barbara, Sara, Linda and Jennifer turned to specific people in their support systems as their protective factors. Noted was the fact that even though inexperience dealing with low-achieving students appeared in both their first and second

year of teaching, the degree was different, calling for a change in protective factor. Protective factors including problem solving helped in finding methods of dealing with student apathy. “Problem solving skills are the ability to generate alternative solutions to conflict situations, evaluate the possible consequences, and choose the most effective solution to the problem. Such skills may moderate the impact of stressors” (Spivack, Platt, & Shure, as cited in Dubow and Tisak, 1989, p. 1413). Sense of purpose aided in student discipline issues and self-efficacy helped the participants to set goals and create a successful learning environment for low-achieving students.

It was through these interactions that the participants moved beyond choosing any protective factor to choosing protective factors that were effective in buffering specific risk factors and building resilience. Goldstein and Brooks (2006) indicate in their research “stressors are life challenges that, if not balanced by external protective processes or resiliency factors within the individual, lead to a disruption in functioning” (p. 11). Therefore, it can be deduced that having a balanced protective process involving a match between risk and protective factors can lead to successful resilience building thereby giving credence to the original four concepts: individuals are considered resilient only if there has been a significant threat to their development; personal and professional risk factors changed between the first and second year of teaching; protective factors also changed in accordance with the changing risk factors between year one and year two of the participants’ initial teaching years; and the interaction between risk and protective factors act as a primary force in the resilience process and stimulate responses to help fight off negative effects of stress thereby building resilience in novice secondary science teachers.

CHAPTER 6

SUMMARY AND IMPLICATIONS

Summary

This study explored the practices of four novice secondary science teachers. The teachers were in their initial years of teaching and worked with students in rural and suburban schools. The importance of this study stemmed from the need to understand why some novice science teachers when faced with adversity stay in the profession when others choose to leave or change schools. Novice science teachers encounter complex risk factors that stem from their personal and professional lives and as such, make choices as to the type and degree of protective factor employed to counteract the influence of risk factors on their practice.

The contributions of this study to the understanding of resilience in novice secondary science teachers come as a result of acknowledging the following: individuals are considered resilient only if there has been a significant threat to their development; personal and professional risk factors changed between the first and second year of teaching; protective factors also changed in accordance with the changing risk factors between year one and year two of the participants' initial teaching years; and the interaction between risk factors and protective factors act as a primary force in the resilience process and stimulate responses to help counteract negative effects of stress thereby building resilience in novice secondary science teachers.

Implications of the Study

General Implications

The researcher attempted to answer the research questions: what are risk factors faced by novice secondary science teachers; what protective factors do they employ when under stress; and how do risk factors and protective factors facilitate the resilience process. An interpretive case study approach was grounded in the broad naturalistic paradigm, which coincided with the purpose to derive meaning from the logic of a naturalistic world-view of how people make sense of their lives. Interpretive naturalistic case study emerged as the appropriate approach to understand how selected factors contribute to shaping novice science teacher resilience. Case study design was selected in order to explore a bounded system over time through detailed, in-depth data collection involving multiple sources of information.

Limitations are found in three areas: the first is found in the small sampling of teachers. Only four teachers were followed for a two-year period. The second limitation is that all the teachers are a single gender. Although that was not a criterion for choosing the participants, no male teachers were a part of the research. The third is the limited context in which the participants were situated. No urban schools were a part of this study and only one rural school was included.

Credibility of this study is derived from the multiple sources of data and length of the study. Specifically, the researcher used in-depth, semi-structured interviews to collect data over a two-year period. This allowed the researcher to enter novice teacher's personal and professional life in order to understand their response to change. Other data were derived from observations conducted during work shadowing to observe the participants in their natural surroundings to gain insight into their working lives, a written prompt to elicit metaphors for personal resilience,

and requests to construct relational maps which depicted changes to support during their initial years of teaching.

The framework of this study was based on Resilience Theory, its close link Relational Culture Theory and constructivism. Resilience Theory looks to an individual's strengths and capabilities to overcome adversity. In light of the findings, resilience in the novice secondary science teachers was a process that entailed the exposure to adversity and the employment of protective factors to overcome that adversity. The building of resilience in the participants was influenced by their personal and professional lives and their interactions with the environment in which they were situated. The protective processes they employed to overcome risk factors in their initial years of teaching included individual skills such as having a sense of purpose, protective factors that entailed both direct and palliative action and the fostering of relationships.

Relational Culture Theory (RCT) is nested within the notion of resilience theory. Relational Culture Theory depicts the strengths of individuals to overcome adversity as the result of human connections that promote mutual empowerment and are growth fostering. Going beyond the mere formation of connections, the participants in the study emphasized relationships as a primary protective factor and one in which they were both a giver and taker of support. Also noted was the fact that relationships changed to accommodate changing risk factors between year one and year two.

Much like the process of resilience, constructivism is conveyed in a range of perspectives on human experiences with the understanding that life and human consciousness is not static, but rather is a continuous process. Through the processes of accommodation, learning from their failures, and assimilation, incorporating new experiences into their existing framework, the participants constructed new knowledge. As such, the teachers were active participants in their

own lives and made choices that affected not only their lives, but also the lives of all with whom they were connected. After reviewing the literature, and carefully describing the risk factors and protective factors of each participant, implications for future research were formulated.

Implications for Novice Secondary Science Teachers

The present study contributed to the understanding of the nature of the resilience process in novice secondary science teachers. The findings derived from the four cases revealed that the personal and professional lives of the teachers influenced their response to risk factors and protective factors employed as part of the resilience process. The findings suggest that novice secondary science teachers attempting to address the risk factors associated with their initial years of teaching will need support in the form of empathic relationships if they are to successfully contend with the personal and professional demands of teaching. It is further implied that:

- Science teacher educators should structure methods courses that consider individual skills such as good communication skills and collaboration strategies as an integral component of the preparation of teachers. The learning environment should encourage preservice secondary science teachers to form support systems that are comprised of reciprocal learning relationships both inside and outside of school, early in their career. Preservice teachers should also be made aware of possible risk factors they may encounter as novice science teachers and how to counteract those risk factors.
- Strategies for matching appropriate protective factors with risk factors can be taught in methods classes, professional development during the initial years of teaching or during department meetings. Strategies include: the use of direct action and/or

palliative action when dealing with stress. Direct action attempts to change the situation that is causing stress. Palliative action attempts to control the stress through relaxation techniques, taking on new hobbies or joining in sports activities.

- School schedules can be organized in a way to promote protective factors such as the formation of support systems and the promotion of individual skills that counteract exposure to adversities.
- Induction programs should offer professional development opportunities that highlight the process framework for building resilience.

Implications for Future Research

Although much research has focused on resilience in children, little has focused on factors that develop resilience in novice secondary science teaches and even less on how protective factors change to meet the changing risk factors incurred in secondary science teachers' initial years of teaching. Given the process framework, future studies should focus specifically on interactions that occur between changing risk factors and protective factors in order to determine the effect on the resilience process.

Replication of this study with a larger sample of teachers over a longer period of time and teaching in a variety of settings would provide valuable information. Longitudinal studies with more science teachers would allow the researcher to focus on the process of resilience at different points in time. Research can address issues concerning risk factors and protective factors in suburban, rural and urban school settings with teachers of both genders and a varying amount of teaching experience.

In addition, this study indicates a need for an exploration of how the knowledge of matching appropriate protective factors to risk factors gained by novice teachers during their

preservice term, can benefit novice science teachers in ways that would help them to foster empathic relational support systems, develop individual skills such as problem solving and appropriately choose between direct or palliative action.

Enduring Ideas

This research suggests that some time-tested advice offered by science teacher educators, administrators, and induction programs, may need to adjust to the realities of what is happening in the field. Changes in advice to preservice teachers should include information on changing risk factors that novice teachers are likely to incur during their initial years of teaching and ways to employ appropriate protective factors that will counteract the resulting stress. Because the initial years of teaching are a particularly vulnerable time for novice teachers, a time in which they are both teaching and learning, focusing on resilience building through use of appropriate protective factors can be the determinant of success as a novice science teacher.

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APPENDIX A1

FIRST INDIVIDUAL INTERVIEW PROTOCOL

First Individual Interview Protocol

1. Tell me about your teacher preparation background.
    - Did you complete a University based teacher education program or an alternative teacher education program?
    - What were the important learning outcomes from your teacher education program?
    - What really works in the classroom?
    - What in your program helped to prepare for your first teaching position?

2. Is your mentor a science person?

3. Describe your teaching assignment.
    - What subject areas are you teaching?
    - How many classes do you teach?

4. Are you able to meet with other biology teachers?

5. Tell me about your school.
    - What support does your school/school district provide for beginning teachers?
    - Describe the induction/orientation program in which you participated.
    - Did any of the experiences target science teachers specifically?

6. Do you have any artifacts that support your experience that you participated in that you'd be willing to share with me?

7. Is there anything else you would like to add about the beginning of classes and what it was like?

APPENDIX A2

SECOND INDIVIDUAL INTERVIEW PROTOCOL

Second Individual Interview Protocol

1. Describe for me the type of extra-curricular activities you are involved in outside of the classroom.

2. Describe how your mentor was assigned to you and how you interact with your assigned mentor.

3. I would like you to create a relational map by placing your name in the center of the paper and the names of all the people you feel support you in your school efforts. Please include family and friends if they apply. Verbally describe each support person as you draw your diagram.

APPENDIX A3

THIRD INDIVIDUAL INTERVIEW PROTOCOL

Third Individual Interview Protocol

1. What factors have facilitated your resilience as a first year teacher?

2. What relationship do you see between your resilience and your staying in the science teaching profession and remaining at your current school f employment for a second year?

3. Please elaborate on the role (insert name) played as part of your support system.

4. How did your induction program help in your first year of teaching?

APPENDIX A3A

PROTOCOL FOR SIGNIFICANT SUPPORT PERSON

Protocol for Significant Support Person

1. Tell me about your relationship with the participant.

2. Are you the assigned mentor?

3. How was the assignment made?

4. Explain the types of help or assistance or guidance that you give. Does your work as a mentor fit into a larger beginning teacher induction offered in the school?

APPENDIX A4

MEMBER CHECKING

Member Checking

1. Do you feel the data were interpreted in a manner that was congruent to your experiences?
2. How would you rate the credibility of the findings?
3. Describe some experience that you have had in your first years of teaching that are connected to the findings.

APPENDIX A5

FIFTH INDIVIDUAL INTERVIEW PROTOCOL

Fifth Individual Interview Protocol

1. What is your definition of resilience?
2. Describe how you would recognize a resilient teacher
3. How effective do you feel you were in your first year of teaching? Give examples.
4. How well qualified do you feel to teach your current curriculum?
5. What do you consider to be risk factors that would make it difficult for you to carry on teaching?
6. What are some things you do to combat the stress you feel?
7. How does stress manifest itself in your daily life?
8. Describe the relationship you have with your students.
9. Please create another relation map that exemplifies your support system in your second year of teaching.

APPENDIX A6

SIXTH INDIVIDUAL INTERVIEW PROTOCOL

Sixth Individual Interview Protocol

1. You mentioned (insert name) as part of your support system in our last interview. Please elaborate on the type of support that person offers.

2. How important is a sense of agency to your ability to be resilient to stress?

3. In what ways do students add to your resilience?

4. How does your school influence how you respond to the demands of teaching?

5. How does your sense of professionalism influence the demands of teaching?

6. How does your personal life influence how you respond to the demands of teaching?

7. What experiences have you had as a second year teacher that has helped you to grow as a teacher?

8. Think of a time when you thought about leaving the profession. Describe your thoughts at the time and what made you choose to remain.

9. Think of a teacher in your school you view as resilient. What characteristics made you identify the person, and what strategies does that teacher use?

10. What are some things that your administrator does to promote resilience in novice teachers?

11. What relationship do you see between resilience and your staying in the science teaching profession and remaining in this school?

APPENDIX B1

THEMES FROM SARA'S CASE

Themes from Sara's Case

Themes	Related Categories	Interactions Involved	Conditions That Give Rise to the Theme	Consequence
Over Commitment	Extra-Curricular Activities Personal Challenges	Volunteering for Saturday Academy Cheerleading Freshman Academy Master's Degree Classes Planning wedding	Need for Teachers to manage extra-curricular activities Changes in personal life Changes in personal and contextual goals	Over-tired Stressed Less time for personal needs
Conflicted Emotions	Need for perfection Type "A" personality	Volunteering Making it perfect	Personal attribute Uncomfortable with change Need to be excellent	Frustration Stress Protective factors and coping skills employed
	Perceptions	Wants to be perceived as doing a good job Perceives administration as not helpful in second year	Need to feel appreciated Not feeling a part of decision making process Not supported during parent conference	Frustration Employed palliative action
Fragile Balance Between Demands and Enjoyment	Support system	Risk factors & protective factors	Demands and enjoyment	Creating and building support system
	Palliative Approach	Hobbies and Sports	Stress	Helps to relieve stress

APPENDIX B2

THEMES FROM BARBARA'S CASE

Themes from Barbara's Case

Themes	Related Categories	Interactions Involved	Conditions That Give Rise To The Theme	Consequence
School Culture	Different from own	Trying to understand teaching strategies that would best lead to student success	Does not live in school community No experience teaching in a black community	Classroom management difficulty Difficulty finding effective teaching strategies
	History of high turnover rate for administrators and faculty	Turnover in administration & faculty Four administrators in last five years	School board appoints administrators New administrators make decisions to non-renew teachers or reassign them	Confusion among students and staff as to rules and procedures Few veteran teachers with more than 5 years to act as mentors
	Absence of common planning time	Wanting to collaborate with co-workers	Small department with only 4.5 teachers Administrator creating school schedule that did common planning time into consideration	Isolates teachers Science dept. on different schedules Cluster groups with no common planning times
	Lack of programs available for novice teachers	Novice teachers looking for support system	Changing administration possibly lead to overlooking novice needs	Added stress for novice teachers to find mentors and navigate through beginning years alone Isolation
Balance Between Stress and Enjoyment	Administrative demands Enjoyment of students success	Exchanges between administrators and faculty Time with students	Teacher stress High needs students Turnover	Stress, frustration, loss of planning, less desire to continue teaching

APPENDIX B3

THEMES FROM LINDA'S CASE

Themes from Linda's Case

Theme	Related Categories	Interactions Involved	Conditions That Give Rise to the Theme	Consequence
History with the School	Family Student Teaching Support Systems	Interact with school community as a family living within the community	3 generations of family in school community Living in school community Familiar with school faculty, administrators and protocol	Confidence Willing to try new ideas Creation of multidimensional support system Ability to confidently change content areas
Broad Science Background	Began in medical school	Worked with patients and later with students	Wide-ranging of science content areas	Confidence in teaching a number of science courses
Focus on the Students	Pre-Service Now	Make changes for future teachers Create better learning environment	Reflection Personal beliefs	Suggests change Creates changes Creates better way to understand students

APPENDIX B4

THEMES FROM JENNIFER'S CASE

Themes from Jennifer's Case

Theme	Related Categories	Interactions Involved	Conditions That Give Rise to the Theme	Consequence
Hardiness	Open to new challenges (1st year)	Teaching ESOL classes Taking the GACE Mentoring new teacher AMGEN fellowship	Personal attribute Liked the idea of working with ESOL students Liked learning about new technology	Certified & Taught ESOL classes Went to NSTA convention in Philadelphia, has online mentor and access to "expert' advise online
Challenges	Unorganized	Difficulty finding items for lessons Resulting need to prioritize what gets done Confusion	Large amount of emails Paperwork Failure to keep organized	Needs to spend time reorganizing Takes time to find and complete mandatory paperwork
	Career vs. Personal life	Teaching in a non-science room 1st year Administrative pressure to take on extra-curricular activities resulting in strain on personal life	Mother sick and extra-curricular activities prevented her from traveling home Planning a wedding	Stress Frustration Needed to find and implement coping strategies Relied on relational connections for support

APPENDIX C

CONTEXTUAL PROFILES

Contextual Profiles

Participant	Type of School	Enrollment	Student Population	Free & Reduced Lunch Eligibility	Median Household Income by Zip	Total Pupil Expense
Barbara	Rural	2,116	74% Black 19% White 5% Hispanic 2% Asian and Native American	76%	$37,044	$11,757
Jennifer & Sara	Sub-urban	2,522	80% White 8% Hispanic 6% Asian 3% Black 3% Native American	8%	$72,331	$11,777
Linda	Sub-urban	1470	70% White 17% Black 7% Asian 5% Hispanic 1% Native American	37%	$42,140	$8,575