COLLECTIVE RESPONSIBILITY, ACADEMIC OPTIMISM, AND STUDENT ACHIEVEMENT IN TAIWAN ELEMENTARY SCHOOLS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in the Graduate School of The Ohio State University

by

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Previous research indicates that collective efficacy, faculty trust in students and parents, and academic emphasis together formed a single latent school construct, called academic optimism. In the U.S., academic optimism has been proven to be a powerful construct that could effectively predict student achievement even after controlling for socioeconomic factors (Hoy et al. 2006a; 2006b; Smith & Hoy, 2007). However, this new construct has never been tested in cultural settings other than the U.S. Therefore, the main purpose of this study was to examine the nature of academic optimism and its ability to predict academic achievement in Taiwan elementary schools. Furthermore, this study also incorporated another important school characteristic, collective responsibility (Lee & Smith, 1996; Lee & Loeb, 2000; LoGerfo & Goddard, 2008), into the theoretical model to examine its relationship with both academic optimism and student achievement in Taiwan.

One hundred three out of 104 public elementary schools in Hualien County, Taiwan were included in the survey. The results of structural equation modeling analysis indicated that academic optimism works in Taiwan in much the same way as it does in the United States. Academic optimism also had the same three dimensions and could significantly affect student achievement after controlling for SES. Further, The results also demonstrated that collective responsibility is a significant factor that has a positive
influence on academic optimism and an indirect effect on academic achievement, regardless the level of SES. This suggested that through improving collective responsibility, academic optimism could be increased, and thus raise student achievement.

To conclude, the results of this study have extended the theory of academic optimism in two ways. First, the study showed that the construct of academic optimism existed and worked in an Asian culture setting. Second, it revealed that collective responsibility seems to be an important factor in cultivating the culture of academic optimism in schools. In the end, the current research also identified some future directions for moving forward in the quest to understand how schools can be designed and shaped to improve academic performance.
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CHAPTER 1

INTRODUCTION

Academic achievement is the major goal of virtually all public schools; in fact, it is the driving force for most attempts to improve schooling. The current research builds on earlier studies of academic optimism in elementary and high schools in the United States (Hoy & Smith, 2007; Hoy, Tarter, & Woolfolk Hoy, 2006a, 2006b) by examining the construct in the context of elementary schools in Taiwan. Furthermore, the research also investigates the relationship between academic optimism and collective responsibility and their association with student achievement. The following paragraphs described the background, rationale, and purpose of the study and briefly defined basic concepts and terms. Finally, the research questions and hypotheses were listed and the limitations of the study are identified.

Background of the Study

Improving student achievement has long been a main theme in schools and education research because it is not only a measure for effective educational systems, but it is also a good predictor of human capital of the future. With the emergence of global competition in human capital, along with the creation of numerous international assessments of student achievement such as Programme for International Student Assessment (PISA) and Progress in International Reading Literacy Study (PIRLS),
interest in student achievement has been renewed and intensified. Every major country has acknowledged that high student achievement is indicative of high educational quality, and high educational quality promotes better human capital. Therefore, for most of the major countries in the world, improving education quality and pursuing academic excellence have become the common visions for their education reform (Luyten et al., 2005).

In the U.S., the embodiment of this vision is the No Child Left Behind Act that passed in January of 2002. We can see that among its four pillars—stronger accountability for results, more freedom for states and communities, proven effective education methods, and more choices for parents—there were two that are focused on improving student achievement (Beard, 2008). Further, because American students are outperformed by many other countries in international student achievement assessments, the U.S. Congress has demanded that The National Center for Education Statistics (NCES) to monitor and report on the status of education in the U.S. and other countries periodically through the results of different international assessments (Provasnik, Gonzales, & Miller, 2009, p. 2). In other words, questing for academic excellence has become the primary goal for education reform in U.S. in recent years.

The same trend also occurred in Taiwan; however, Taiwan’s story differs from the U.S experience. Like most other Asian countries, academic achievement in Taiwan has always been the most important goal for schools, parents, and students. In fact, it probably has been overemphasized to the extent that students are burdened with pressures
for getting good grades, because having high scores in entrance exams are essential for students to be enrolled in high schools and universities (Chou, 2003).

In order to change this so called “exam culture,” an education reform began in 1995. Its main goal is to reduce the pressure of exams by lowering the difficulty of the curriculum and establishing more high schools and universities. However, after 10 years, the reform has been considered a failure. Teachers complained about the significant reduction in students’ academic abilities, especially for the students from rural areas and families with low socioeconomic status (SES). Yet, the pressure of exams has actually been strengthened due to the increase of high schools and universities. Because now almost every student can get into a high school or a university easily, in order to be distinguished, the competition between students for prestigious schools has been further intensified. The polarized effects further increased student achievement gaps between students from low SES families and students from high SES families (Chou, 2003; Wu, 2006). Therefore, in recent years, the Ministry of Education in Taiwan has reemphasized the importance of improving academic achievement of students and closing learning gaps of students from rural areas and low SES families. This made the education policy goals in Taiwan similar to those in the United States in recent years.

However, increasing student achievement and closing achievement gaps between students are no easy tasks because socioeconomic status (SES) has been proven to have great influence on student achievement. Coleman and his colleagues (1966) demonstrated that school factors accounted for only a negligible amount of the variance in student achievement, while students’ socioeconomic status and family background differences
explained the majority of student achievement. Many other research findings supported Coleman’s results (Jencks, 1972; Luyten et al., 2005). According to OECD’s research based on the results of PISA 2000, in OECD countries, around 50% of the between-school variance in reading literacy is explained by student background, and around 18% by the school context (mainly school socio-economic status), whereas only around 5% of variance is explained by the school policies and school resources combined (Luyten et al., 2005). In the U.S., the situation is even worse, student characteristics explain up to 57%, and school context explains 28%. Though Taiwan was not included in the PISA research at that time, research in Taiwan has also demonstrated that it is socioeconomic factors, rather than school factors, to have significant influence on student achievement (Chien, 1984; Hsieh, 2003; Lin & Ma, 1983). Therefore, the strong effect of socioeconomic status on student achievement is a worldwide phenomenon.

This phenomenon is not encouraging for policy makers and school leaders because student socioeconomic status is not easily changed. Many researchers have tried to refute Coleman’s conclusion by searching beyond context factors to explain academic achievement (Edmonds, 1979; Purkey & Smith, 1983), but their success has been limited. In most statistical models predicting achievement, when socioeconomic status is added as a control variable, the effect of school factors on student achievement often disappears.

Researchers, however, have recently identified three school characteristics that were consistently significantly related to student achievement while controlling for context factors: collective teacher efficacy (Cybulski, Hoy, & Sweetland, 2005; Goddard, 2001; Goddard, Hoy, & Woolfolk Hoy, 2000, 2004; Goddard, LoGerfo, & Hoy, 2004;
Hoy, Sweetland, & Smith, 2002), faculty trust in clients (Goddard, Tschannen-Moran, & Hoy, 2001; Hoy, 2002; Hoy, Smith, & Sweetland, 2002; Hoy & Tschannen-Moran, 2003), and academic emphasis (Goddard, Sweetland, & Hoy, 2000; Hoy & Hannum, 1997; Hoy & Sabo, 1998; Hoy, Tarter, & Bliss, 1990; Hoy, Tarter, & Kottkamp, 1991). After reviewing the literature, Hoy and his colleagues (2006a; 2006b) have theorized and argued that these three school characteristics could come together to form a single latent construct called academic optimism, which significantly predicted student achievement after controlling socioeconomic status and previous achievement. These recent findings point to new directions for policy makers and school leaders to improve school effectiveness.

Statement of Problem

The theoretical structure of academic optimism, the validity and reliability of its measurement in elementary and secondary school level have been supported by many previous studies (Hoy, Tarter, & Woolfolk Hoy, 2006a, 2006b; Smith & Hoy, 2007). Moreover, relationships between academic optimism and several other school level characteristics have been established, as well as the power of academic optimism to predict student achievement regardless of socioeconomic status (Bevel, 2010; Kirby & DiPaola, 2009; Smith & Hoy, 2007; Wagner, 2008). However, there are two major areas in the existing body of knowledge on school academic optimism needs attention and elaboration.

First, because previous academic optimism studies were mostly conducted in U.S. or Canadian schools, the validity and the reliability of its measurement, as well as its
ability to predict student achievement in other countries with different culture contexts is still unknown. It is possible that the general nature of academic optimism, its measurement, and its interaction with other school variables might change as the context of the culture changes.

For instance, in most East Asia countries, due to the “exam culture,” attending private cram schools after the regular school time is extremely popular for students. According to the data from Taiwan Education Panel Survey, there were over 50% of attended cram schools after class. Most of the students attended cram schools after 4 to 8 hours per week, and about 10% of them attended over 12 hours per week (Liu, 2006). With this magnitude and intensity, the effect of private cram schools on student achievement might change the relationship between school academic optimism and achievement outcome. The influence of school academic optimism might have lesser effect on student outcome.

Differences in language might also affect the validity and reliability in measurement. For example, during the interview for faculty trust scale in Taiwan, when teachers facing the item “Teachers in this school trust their students,” became confused and asked, “Do you mean trust students to behave well in class or get good scores on tests?” This happens because in Chinese, the word trust is too vague and needs to be elaborated more for people to truly understand what are you asking.

Many other cultural factors such as the generally less professional interaction among teachers and the lack of community engagement in Taiwan schools might also alter the mechanism and the power of academic optimism. Therefore, an investigation on
the nature and effect of academic optimism in other countries and cultural contexts is necessary.

Second, due to the difficulty of collecting school level data, there have been only a few research studies of school level factors that might predict or enhance school academic optimism. Currently there are four other variables that have been confirmed to have significant and positive relationship with academic optimism. They are enabling school structure (McGuigan & Hoy, 2006), organizational citizenship (Wagner, 2008), community engagement (Kirby & DiPaola, 2009), and Transformational leadership (Rutledge, 2010). In order to give educational leaders and administrators more possible routes to foster a culture of academic optimism in their schools, more research is required that could broaden our understanding of the nature of academic optimism and discover mechanisms that enhance academic optimism.

Due to the previous reasons, more refined and contextual-fit surveys of academic optimism are needed for different school settings and levels.

**Purpose of the Study**

The purpose of this study is twofold. First, in order to examine the generalizability of the construct of academic optimism to other countries and cultural setting, this research will test the validity and the reliability of the construct of academic optimism and its relationship with student achievement in Taiwan elementary school settings. Due to the similarity of school cultures in East Asia, the researcher argued that the result would provide evidence that the concept of academic optimism would apply in other countries in East Asia such as Japan, Korea, and People’s Republic of China, and
add to the existing body of knowledge in the area of academic optimism for elementary schools.

Second, in order to broaden our understanding of the nature of academic optimism and its relationship with other possible school variables, this study will examine the validity and reliability of the construct of collective responsibility and its relationship with both academic optimism and student achievement in the setting of Taiwan elementary schools. Collective responsibility represents teachers’ willingness to accept responsibility for all students’ learning (LoGerfo & Goddard, 2008). Previous quantitative research suggested that collective responsibility has a direct and positive relationship with student achievement (Lee & Smith, 1996; LoGerfo & Goddard, 2008). Further, research also pointed out that teachers’ collective responsibility has no significant relationship with SES, and it could close the learning gap between high SES and low SES students in a school (Lee & Smith, 1996; LoGerfo & Goddard, 2008). If this research could confirm that collective responsibility has a direct and positive relationship with academic optimism, it means that there is a way that we can improve academic optimism that is free from the influence of SES.

In conclusion, the researcher’s goal is to develop a more comprehensive model of how academic optimism works in Taiwan elementary schools and thus provide more insight for school leaders to make more informed decisions to foster student learning in spite of the negative effect of socioeconomic status.
Statement of the Research Questions

The following research questions guide this study:

1. Is academic optimism a single characteristic of schools that is manifested through collective efficacy, academic emphasis, and trust in Taiwan elementary schools?

2. What is the relationship between academic optimism and student achievement?

3. What is the relationship between collective responsibility and student achievement?

4. What is the relationship between academic optimism and collective responsibility?

At this stage of the research, the questions are in need of specific answers. In the next section, hypotheses will be sketched for each question.

Statement of Research Hypotheses

Based on the research questions, the following research hypotheses are proposed:

H.1 Academic optimism is a single, latent trait of schools that is manifested through collective efficacy, academic emphasis and trust in Taiwan elementary schools.

H.2 Academic optimism has a direct and positive relationship with student achievement, even after controlling for SES.

H.3 Collective responsibility has a direct and positive relationship with student achievement, even after controlling for SES.
H.4 Collective responsibility has a direct and positive relationship with academic optimism.

**Definition of Major Terms and Concepts**

The major concepts of the study are briefly defined below. Each of these terms is part of the review of the literature in the next chapter as the relevant literature is examined and as a model for school student achievement is elaborated.

*Academic Emphasis* — It is the “the extent to which a school is driven by academic excellence” (Goddard, Sweetland, & Hoy, 2000, p.686). Scholars described that in a school with high academic emphasis, high but achievable academic goals are set for students; the learning environment is orderly and serious; students are motivated to work hard; and students respect academic achievement.

*Collective Efficacy* — It is “the judgment of teachers that the faculty as a whole can organize and execute the actions required to have positive effects on students” (Goddard, Hoy, & Woolfolk Hoy, 2004, p.4).

*Faculty Trust in Students and Parents (Clients)* — It is faculty’s willingness to be vulnerable to students and parents based on the confidence that the students and parents are benevolent, reliable, competent, honest, and open (Hoy & Tschannen-Moran, 2003). It can also be called collective trust (Forsyth et al., 2011).

*Academic Optimism* — It is an organizational culture that is created by the interactions between collective efficacy, faculty trust, and academic emphasis, which could create a belief among faculty that academic achievement is important, that faculty
has the capacity to help students achieve, and that students and parents can be trusted to cooperate with them in this endeavor (McGuigan & Hoy, 2006).

*Collective Responsibility* – It is teachers’ willingness to accept responsibility for their students’ learning (LoGerfo & Goddard, 2008).

*Socioeconomic Status* – In this research, the indicator for socioeconomic status for a school in this research is the percentage of students who received free lunch from the county government.

*Student Achievement* – The measurement of school student achievement in this study is based on the test result of 2011 Hualien Basic Competence Test for Elementary School Students. Each school’s 5th and 6th graders’ average scores on Chinese and Mathematics are the indicators for student achievement of schools.

**Limitations of the Study**

This study mainly focused on the relationship of student achievement with two positive collective characteristics of schools, academic optimism and collective responsibility in Taiwan. Participation in the study was voluntary. Because data were collected from 103 out of all 104 public elementary schools in Hualien County, Taiwan, the data and the results should represent the current school situation in Hualien well. Hualien is a county that has a wide range of different size cities and schools (from cities to very rural areas), the results from this study should be generalizable to many other elementary schools settings in Taiwan.

However, due to the lack of metropolitan cities (which contended over one million people) in Hualien, caution should be made in generalizing the results to
metropolitan setting such as Taipei and Kaohsiung. This research is also a beginning, exploratory analysis of the relationship between these school variables; hence, further research is needed to confirm the validity of this study.

Summary

In the first chapter, a brief description of the background, problem, and purpose of this study has been offered. According to previous research, academic optimism has been a powerful construct that could effectively predict student achievement even after controlling for socioeconomic factors in the U.S (Hoy et al. 2006a; 2006b; Smith & Hoy, 2007). However, this new construct has never been tested in Asian cultural settings. Thus, the main purpose of this study is to examine the nature of academic optimism and its ability to predict academic achievement by using structural equation modeling in Taiwan elementary schools. Furthermore, this study also incorporated collective responsibility into a theoretical model to examine its relationship with both academic optimism and student achievements in Taiwan. The results of the research are expected to expand the existing body of knowledge on academic optimism and to provide insights and practical opportunities for school administrators to improve their schools.
CHAPTER 2

REVIEW OF LITERATURE

In this chapter, the concepts in this study and their theoretical root will be reviewed. First, the ancestry and overview of the three components of academic optimism: collective efficacy, faculty trust in parents and students, and academic emphasis will be discussed accordingly. Second, the development of academic optimism and collective responsibility will be reviewed. Finally, by using the current literature, the theoretical rationales for the hypotheses and models for this research will be presented.

Academic Optimism and Its Three Components

Academic optimism could be described as a compilation of a 40-years academic quest for school characteristics that have a significant influence on student achievement while overcoming the effects of socioeconomic status (SES) (Hoy, 2012). The origin of this quest could be traced to Coleman’s landmark work in 1966. In this study, Coleman and his colleagues concluded that schools only had minimal influence on student achievement in comparison with the influences of socioeconomic background (Chou, 2003). In 1972, Jencks reached the same conclusion and proposed that, “the character of a school’s output depends largely on a single input, namely the characteristics of the entering children” (Jencks, 1972, p. 256). These are very pessimistic conclusions for public education because SES is a not a variable that can be changed significantly by
school administrators and teachers. Therefore, the search for school characteristics that could go beyond the influence of SES to affect student achievement significantly has continued since the 1970s (Hoy, Tarter, & Woolfolk Hoy, 2006a, 2006b).

Nevertheless, this has not been an easy journey because Coleman was not wrong. SES indeed is a very powerful factor affecting student achievement. Most of the time when SES has been included in research, the relationship between many school variables and student achievement has vanished (Hoy, 2012). However, Coleman is not entirely correct either. After many detours, with more advanced statistical procedures and data collection methods, educational scholars have identified at least three school variables that are consistently related to student achievement after controlling for SES. They are collective teacher efficacy, faculty trust in students and parents, and academic emphasis (Hoy, Tarter, & Woolfolk Hoy, 2006a, 2006b).

These three school variables later became the foundation for the development of academic optimism. Hoy and his colleagues theorized that these three school characteristics are the three dimensions of the construct of academic optimism. Therefore, in order to understand the construct of academic optimism, the concepts of collective teacher efficacy, faculty trust in students and parents, and academic emphasis are discussed first in the following sections.

Collective Teacher Efficacy

Collective teacher efficacy in schools "is the judgment of teachers that the faculty as a whole can organize and execute the actions required to have positive effects on students" (Goddard, Hoy, & Woolfolk Hoy, 2004, p.4). The theoretical foundation of
collective efficacy came from Bandura’s social cognitive theory and its two important concepts, human agency and efficacy beliefs (Bandura, 1986, 1997).

Social cognitive theory is an analytical framework for explaining the dynamics of human behavior. It assumes that “the human mind is generative, creative, and proactive, not just reactive” (Bandura, 1997, p. 3). Therefore, people do not just passively react to their environment, rather, they strive to control the circumstances around their life and act intentionally. This “power to originate actions for given purposes” (Bandura, 1997, p. 3) is called human agency.

In Bandura’s view, the mechanism of human agency works in an emergent and interactive way. He proposed that among human behaviors, personal factors, and external environment, there exists a triadic reciprocal causation relationship (Bandura, 1989, 1997). Bandura further explained, “In this transactional view of self and society, internal personal factors in the form of cognitive, affective, and biological events; behavioral patterns; and environmental events all operate as interacting determinants that influence one another bi-directionally” (Bandura, 1997, p. 6). Figure 2.1 illustrates the reciprocal nature of the three factors of human agency.
Though the mechanism of human agency involves many factors, Bandura believes that they are all rooted in people’s efficacy beliefs, which are defined as people’s “future oriented judgments about capabilities to organize and accomplish courses of action needed to produce the results desired for specific situations or contexts” (Bandura, 1997, p. 271). Bandura asserted that this efficacy belief “regulates human functioning through cognitive, motivational, affective, and decisional processes” (Bandura, 2002, p. 270), and thus without it, there would be little incentive for people to act or preserve when facing difficulties. In other words, human choices and level of control over their actions and future are largely determined by the perceived self-efficacy belief. According to Bandura (1997), people with high self-efficacy are more likely to seek challenges,
enable one to use skills more effectively, set higher goals, put higher effort to accomplish goals, and give up less easier when facing difficulties.

Bandura proposed that self-efficacy belief was derived from four sources: mastery experiences, vicarious experiences, social persuasion, and affective states (Bandura, 1989, 1997). Mastery experiences are experiences in which a person’s effort produces positive results. These experiences of success in producing positive outcomes make people believe that they have what it takes to succeed, thus the experiences reinforce and strengthen the desired behaviors. Since mastery experience is generated from an individual’s direct experience, it is also the one that has most impact on self-efficacy (Bandura, 1997).

Vicarious experiences are experiences that are learned from observing others’ actions and their outcomes. If the observed activities produce positive outcomes, then individuals believe that they can perform similar level of actions, and the individuals’ self-efficacy increases because they gain confidence that they also can produce positive results (Bandura, 1997).

Social persuasion occurs when someone or a group convinces an individual that he or she has the ability to perform the task and gain positive results. The more an individual believes in the encouragement, the more likely self-efficacy will increase. However, because social persuasion is not based on one’s direct and reliable experience, usually its effect is weaker and unstable.

The last is affective status, Bandura (1997) described it as personal emotions and feelings that affect the individual’s willingness to engage in particular actions. If it’s a
positive emotion such as enthusiasm or hope, then individuals gain confidence in their ability to achieve the task, and thus self-efficacy increases. However, if it’s a negative emotion such as anxiety or depression, then the individuals shift the focus away from performing the tasks and self-efficacy decreases.

There are also two characteristics about self-efficacy that need to be mentioned. The first is that self-efficacy is context-specific, and the second is that self-efficacy is future oriented. Context-specific means that a person’s sense of self-efficacy would vary according to the context or the situation he or she is in. Therefore, a person might have high efficacy in performing one task, but have low efficacy in performing the other task. For example, a person might have high efficacy in playing table tennis, but have low efficacy in playing piano. Self-efficacy is also future-oriented. The judgment of efficacy belief should be based on what an individual can do in the future, not what the individual has done. Therefore, usually measurements of efficacy don’t use past tense in constructing items (Bandura, 1986, 1997).

Bandura’s social cognitive theory and his concepts of human agency and efficacy belief didn’t stop at individual level. He argued that there are three modes of human agency, personal agency, proxy agency, and collective agency (Bandura, 1997, 2000, 2001). Personal agency indicates how individuals achieve goals through their individual actions. The cognitive and affective processes we centered on in previous paragraphs are mainly in this level. However, in some situations, individuals can’t achieve goals through their direct actions. Under these circumstances, people try to get other people who possess expertise or influences to act on their behalf to get desired outcomes. This
mechanism is called proxy agency. In still other cases, if the desired outcomes can only be achieved by interdependent actions, people have to work together to secure what they can’t accomplish on their own. The mechanism of a group of people working together to achieve their desired goals is called collective agency.

When social cognitive theory extends the concepts of human agency to collective agency, the concept of self-efficacy has also been extended to collective efficacy. Like self-efficacy, collective efficacy is also a belief in the ability to produce desired outcome, however, this time it’s a shared belief among members. Bandura defined collective efficacy as “a group’s shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments” (Bandura, 1997, p. 477).

The concept of collective efficacy is rooted in self-efficacy, therefore, it is not surprising that collective efficacy has similar characteristics to self-efficacy, such as being context-specific and future-oriented. Bandura asserted that collective efficacy beliefs have “similar sources, serve similar functions, and operate through similar processes” (Bandura, 1997, p. 478). Further, collective efficacy has a strong effect on the performance of a group through its influence on goal setting, efficient use of resources, effort, persistence, and resilience (Bandura, 2000).

However, collective efficacy is not simply the sum of the efficacy belief of individual members. According to Bandura, collective efficacy is highly affected by the interactive, coordinated, and synergistic dynamic of groups (Bandure, 2000). Thus, collective efficacy is an emergent group-level property that is more than the sum of its
individual attributes. For example, if a group of talented people can’t work well together, then even though each of them has high self-efficacy, the group as a whole might still have a low sense of collective efficacy because the individuals realize that they can’t collaborate well with each other. Therefore, Bandura suggested that the measurement of collective efficacy should be based on members’ judgments of their group’s capability operating as a whole because this would better encompasses the coordinative and interactive nature of collective efficacy (Bandura, 2000).

The main reason why efficacy beliefs are popular among researchers in various fields is that efficacy beliefs can have strong influences on outcome performances. Bandura suggests that the stronger the beliefs people hold about their capabilities, the more they achieve (Bandura, 1997). The statement has been verified in many fields such as organizational development, industrial manufacturing, sports teams, health management, and of course, education (Bandura, 1986, 1993, 1997; Goddard, et al., 2004; Goddard & Skrla, 2006; Little & Madigan, 1997; Spink, 1990; Watson, Chemers, & Preiser, 2001). In the field of education, the relationship between efficacy beliefs and school performance has been examined in the following three areas: student self-efficacy in learning (Pajares, & Miller, 1994; Pajares, 1997), teacher self-efficacy (Goddard & Skrla, 2006; Ross, Hogaboam-Gray, & Gray, 2006; Skaalvik & Skaalvik, 2007; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998), and collective teacher efficacy (Bandura, 1993; Goddard et al., 2000; Goddard, 2001; Goddard, LoGerfo, & Hoy, 2004; Goddard & Skrla, 2006; Hoy, Sweetland, & Smith, 2002). Because the context of this
literature review is at school level, we focus primarily on the research related to collective teacher efficacy.

Bandura (1993) was the first one to establish the relationship between collective teacher efficacy and academic achievement. By using a path model analysis, Bandura explored the relationship between collective teacher efficacy, socioeconomic status, academic achievement, and prior level of students’ academic performance. The result demonstrated that collective teacher efficacy has a significant effect on student achievement (β = .34, p < .01). Furthermore, the result indicated that the effect of collective teacher efficacy on student achievement is actually greater than the effect of SES on student achievement (β = -.26, p < .01), and as the same as the effect of prior students’ academic achievement on student achievement (β = .34, p < .01) (Bandura, 1993). This research has demonstrated that collective efficacy is an important school factor that can highly influence school outcome, even after controlling for SES.

In 2000, built on the theoretical basis of Bandura’s (1986, 1993, 1997) work and the teachers’ sense of efficacy model development by Tschannen-Moran and her colleagues (1998), Goddard and his colleagues (2000) further explored the concept of collective teacher efficacy and its measure. They defined collective teacher efficacy as “the perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students” (Goddard et al., 2000). Based on the model of teacher efficacy (Tschannen-Moran et al., 1998), they proposed that there are two key elements in the development of collective teacher efficacy: analysis of the teaching task and the assessment of teaching competence. Figure 2.2 illustrated the model of how collective
teacher efficacy was developed. As shown in Figure 2.2, the outcome provides feedback to the teachers, which provides new interpretation of the situation. After the analysis of the teaching tasks and group competence, the new estimation of collective teacher efficacy was born. Then, base on the result of the new estimation of collective efficacy, the performance of the teachers as a whole would be affected, which then formed new feedback for the teachers.

Figure 2.2: A Model of the Development of Collective Teacher Efficacy (Goddard et al., 2000, p. 486)
Under the model Goddard and his colleagues (2000) proposed, they created a new instrument, the Collective Efficacy Scale (CES), to measure collective efficacy. The construct and the new measurement were tested 47 elementary schools in an urban Midwestern school district. The results of the study indicated that collective teacher efficacy was a unified construct, and it was positively related with the differences in academic achievement among schools (Goddard et al., 2000). Based on the study (Goddard et al., 2000), Goddard (2001) took a step further by adding prior academic achievement and SES to the model to demonstrate that collective teacher efficacy was still positively and significantly related to student achievement after controlling for these two powerful variables.

Later, Goddard (2002) revised the Collective Efficacy Scale (Goddard et al., 2000) in order to “improve its measurement by constructing a more conceptually pure and parsimonious version of the scale” (p. 97). The study resulted in the development of a new valid and reliable instrument, the Collective Efficacy Scale Short Form. Goddard’s results provided “initial evidence that using a 12-item scale that balances the relative weights given to the elements of collective efficacy ... is equally as effective as using the original 21-item scale" (p. 108).

Hoy et al. (2002) extended the research on collective teacher efficacy to high school level. After controlling for SES and academic emphasis, The authors found that collective teacher efficacy was critical in explaining academic achievement and its effect was even larger in magnitude than SES. Also, the results indicated that academic
emphasis worked through the construct of collective efficacy to influence student achievement.

Goddard, LoGerfo, & Hoy (2004) continued the study of collective teacher efficacy at secondary level to understand its relationship with student achievement. In this research, they included more variables in the model to create a more comprehensive explanation. Therefore, beyond reading and mathematics outcomes, they also added mathematics, science, reading, social studies, and writing achievement results as outcome variables. Also, besides SES; urbanicity, school size, percentage of minority, and enrollment data were also collected in the study. They have used correlational analyses, and structural equation modeling analyses to exam their model. The results indicated that mastery experience was a positive predictor of collective teacher efficacy; that there were no significant relationships between urbanicity and collective teacher efficacy; and that there were no significant relationship between percentage of minority and collective teacher efficacy. The study again showed that collective teacher efficacy is an important school variable that has crucial effect on academic outcomes. Goddard, LoGerfo, & Hoy (2004) concluded that

Perceived collective efficacy was a significant and consistent predictor of the proportion of 12th grade students who passed mandatory assessments of achievement in five content areas, even when controlling for SES, minority enrollment, urbanicity, school size, and prior achievement. (p. 419)

In the same year, Goddard, Hoy, & Woolfok Hoy (2004) also reanalyzed the theory of collective teacher efficacy and its effect on teachers’ practices and student learning. This study developed a conceptual model to explain the formation, dynamics, and change of collective teacher efficacy in a school. These research also discussed many
aspects of collective efficacy such as the clarification of its definition; issues in measurement; the role of group goal attainment; and how individual teacher efficacy would influence collective teacher efficacy.

Besides academic achievement, collective teacher efficacy has also been linked with many other variables in schools, such as individual teacher efficacy (Goddard & Goddard, 2001), school climate and faculty trust (Tschannen-Moran, 2001), perceived teacher preparation quality and student teaching experiences (Knobloch & Whittington, 2002), teacher job satisfaction (Caprara, Barbaranelli, Borgogni, & Steca, 2003); collaborative school process (Ross, Hogaboam-Gray, & Gray, 2004), goal consensus and vision (Kurz & Knight, 2004), and school social composition (Goddard & Skrla, 2006).

In conclusion, previous research studies have demonstrated that “collective efficacy is a key concept in explaining student achievement even after controlling for socioeconomic status, previous achievement, and other demographic variables” (Hoy et al., 2006b, p. 139) at all school levels.

Faculty Trust in Students and Parents

Faculty trust in students and parents (clients) or collective trust (Forsyth et al., 2011) can be defined as “faculty’s willingness to be vulnerable to another party based on the confidence that the latter party is benevolent, reliable, competent, honest, and open” (Tshannen-Moran & Hoy, 2000). It’s a collective property which represents the extent to which the school faculty as group is willing to risk vulnerability. Generally, collective faculty trust can be categorized by its referent. In the context of academic optimism, the referents are both students and parents. Among different kinds of collective trust, faculty
trust in students and parents is the one that were incorporated in the construct of academic optimism. Therefore, faculty trust or collective trust in academic optimism can be defined as “faculty’s willingness to be vulnerable to students and parents based on the confidence that the students and parents are benevolent, reliable, competent, honest, and open” (Hoy & Tschannen-Moran, 2003). In the following paragraphs, the development of faculty trust and related research were presented.

28 years ago, Hoy and Kupersmith (1984) were the first ones who examined the concept of faculty trust in the context school. The authors proposed that faculty trust is a collective belief that not only “the word or promise of another individual or group are reliable, but also the same individual or group would act in the best interests of the faculty”. In the study, they have identified three referents of faculty trust, they are trust in the principal, trust in colleagues, and trust in the organization. Therefore, at that time, faculty trust in students and parents was not included in their study. According to their hypothesis, these three levels of faculty trust should have significant effect on the outcome of an organization. However, the result is puzzling because it shows that none of them could make significant affect on student achievement after controlling for SES (Hoy & Kupersmith, 1984, 1985).

It is after more then a decade later, Hoy and Tschannen-Moran (1999) decided to revisit the construct of faculty trust in the context of school. Through their extensive literature review in sociology, economics, organizational service, and etc., they conceptualized that trust is a five-facets construct. The five facets are reliability, benevolence, competence, honesty, and openness. In this study, the authors incorporated
a different set of three referent levels into their framework: trust in principal, trust in colleagues, and trust in students and parents. With the three referent levels and the five facets of trust, the authors developed a valid and reliable instrument, Trust Scale, to capture faculty trust in schools.

This study served to theorize faculty trust as a multifaceted construct and to establish a valid and a reliable measures of trust in schools for future research. Also, more importantly, the study found that faculty trust in parents and faculty trust in students were not two different constructs. Instead, they merged together as one single factor which the authors called it faculty trust in clients because both students and parents are groups that the faculty served (Hoy & Tschannen-Moran, 1999).

In the next year, Tschannen-Moran and Hoy (2000) conducted a more complete multidisciplinary review of trust grounded in the many other fields such as sociology, psychology, philosophy, and economics. After synthesizing previous studies, they argued that that the construct of trust should have six facets. They are willingness to risk vulnerability, benevolence, reliability, competence, honesty, and openness. These six facets of trust were described in the following paragraphs.

**Willingness to risk vulnerability.** The “willingness to be vulnerable” is a crucial condition for trust because people do not have a need to trust anyone to whom they are not vulnerable (Tschannen-Moran & Hoy, 2000). Vulnerability is a reliance on the actions of others and a belief that those actions will not be detrimental, but favorable to the vulnerable party. There is a presence of trust when the vulnerable party acts in spite of recognized vulnerability.
**Benevolence.** Benevolence is the belief that one’s well-being, or something one cares about, will be protected and not harmed by the trusted party. (Butler & Cantrell, 1984). Trust is the assurance that the other will not exploit one’s vulnerability or take excessive advantage of one even when the opportunity is available (Cummings & Bromily, 1996).

**Reliability.** Butler and Cantrell (1984) viewed reliability as a belief that one can count on others to follow through with their commitments. We can depend on those we trust to do as they say they will. Therefore, at the most basic level, trust has to do with the consistency of behavior and knowing what to expect from others. Having trust in someone is the confidence that he or she will perform as we expected them (Mishra, 1996).

**Competence.** Competence is a person’s ability to complete expected tasks properly within certain standards (Tschannen-Moran & Hoy, 2000). Trust instills a belief that a person can meet our expectations of performance of responsibilities.

**Honesty.** Honesty is a crucial prerequisite of trust. It speaks to a person’s character, integrity, and authenticity. The actions and words of a person must be aligned because only when actions and intentions are united, honesty, character, and integrity are exposed. (Tschannen-Moran & Hoy, 2000).

**Openness.** Openness is the degree a person is willing to share and be vulnerable. Those who exhibit the characteristics of being open display a vulnerability to others, which fosters trust from others (Tschannen-Moran & Hoy, 2000).
One thing to be noticed is that the authors pointed out that although these facets work together to form the construct of trust, the importance of each facets of faculty trust would vary based on individuals and situations (Tschannen-Moran & Hoy, 2000).

Subsequent studies were focused more on examining the relationship between faculty trust in clients and student achievement. Goddard, Tschannen-Moran and Hoy (2001) were the first to investigate the relationship between faculty trust in students and parents and academic achievement. They tested the relationship between collective trust in clients and student achievement at elementary schools. They used hierarchical linear modeling (HLM) to explore the variation of faculty trust in both within and between schools. The authors found that faculty trust varied slightly more between schools than within schools. Also, the results again showed that trust in parents and trust in students come together as a single construct of trust. Further, after controlling demographic characteristics, SES, and prior achievement, the authors found that faculty trust in clients was still a significant factor of differences between schools in both reading and mathematics achievement.

Hoy (2002) later further examined the relationship between faculty trust and student learning at secondary level. The author suggested that faculty trust is an important factor of learning because learning is a cooperative behavior. “Teaching and learning require one to see others as competent, to believe that others’ intentions are benevolent, and to view others as honest and reliable”. Therefore, the author argued that there should be a positive and significant relationship between faculty trust in clients and high school student achievement. The results supported the hypothesis and indicated that the
relationship between trust in clients and student achievement was still significant even after controlling for SES. Based on the positive result of this finding, the author offered many practical implications and suggestions to improve academic achievement through building collective trust between faculty, teachers, and students.

In the same year, Bryk and Schneider (2002) have also studied the relationship between collective trust and student achievement. They conducted a research based on a 3-year longitudinal case study in 12 Chicago primary schools. Survey data, and in-depth interviews were used in the research design. Like Tschannon-Moran and Hoy (2000), they found that trust in parents and trust in students come together as one single factor. They theorized that it is because that in elementary schools, trust between teachers and students worked largely through trust between teachers and parents. Also, their findings demonstrated that collective trust among teachers, students, and parents were crucial factors for achievement improvement.

Later, Hoy and Tschannen-Moran (2003) again revisited the literature of trust, and attempted to develop a new scale for trust. After reviewing the literature, they defined trust as "an individual's or group's willingness to be vulnerable to another party based on the confidence that the latter party is benevolent, reliable, competent, honest, and open" (pp. 185-86). The authors developed a new Omnibus Trust Scale to measure faculty trust in students and parents at both elementary and secondary school levels. Their research suggested that faculty trust in students and parents was an important factor in collaboration with the community on decision making.
The significance of trust in students and parents has been demonstrated in many research studies; however, there has been relatively few studies on what other school variables that might give rise to faculty trust in students and parents. Hoy and Tschannen-Moran (1999) showed that higher levels of shared decision-making with both parents and faculty likely result in higher levels of faculty trust in clients. Van Houtte (2006) demonstrated that there is a relationship between faculty trust and teachers’ job satisfaction in Belgium secondary schools.

In conclusion, faculty trust in students and parents has constantly been demonstrated to be an important school property to enhance academic achievement, even after controlling for SES. However, the factors that might foster trust between students and parents are still unclear and needed to be investigated.

*Academic Emphasis*

The third concept that constitutes academic optimism is academic emphasis. In the context of academic optimism, it has been defined as “the extent to which a school is driven by a quest for academic excellence” (Goddard, Sweetland, & Hoy, 2000, p.686). Goddard, Sweetland, and Hoy (2000) proposed that it is a way to conceptualize the normative and behavioral environment of a school which further influence on both individual and organizational behaviors. As a group attribute, academic emphasis not only reflects how much a school values academic success, but also reflects how much faculties did to improve student learning and academic achievement. Therefore, Hoy and his colleagues incorporated it as the behavioral enactment of academic optimism (Hoy et al., 2006a; 2006b). Goddard and his colleagues (2000) described that in a school with
high academic emphasis, teachers set high but achievable goals for students and believe that the students have abilities to success; the learning environment is serious and orderly, and students, as well as faculties emphasize and respect academic success.

In the context of academic optimism, the concept of academic emphasis was originated from the research of school health climate. Mathew Miles (1969) was the first one that used health as a metaphor to examine the characteristics of schools. He argued that a healthy school not only survives in its environment, but also keep on growing and cope adequately to become prosperous over a long time (Miles, 1969). This definition implies that a healthy organization may be effective or ineffective in a short period, but in a long run, it can overcome obstacles from the outside and achieve its missions and goals. Just like a healthy man might be sick a day or two, but he could recover quickly and show an overall good health in a long run. Miles developed 10 dimensions of healthy organizations based on his definition. Miles’s work is a heuristic one for future viewing about schools; however, attempts to operationalize his model and to develop valid and reliable measure for it have never been successful for researchers (Fairman, Holmes, Hardage, & Lucas, 1979; Hoy & Tarter, Kottkamp, 1991; Kimpston & Sonnabend, 1975; Miles, 1969;). Out of the 10 dimensions that Miles proposed, researchers usually could only measure 6 of them (Hoy & Feldman, 1987).

In order to develop a proper measure for school health, Hoy and Feldman (1987) conceptualized school health from a different root. They used the theoretical foundations created by Parsons, Bales, and Shils (1953). Parsons and his colleagues suggested that in order to survive, schools have to fulfill four basic needs of organizations: the imperative
functions of adaptation (acquiring sufficient resources and accommodating to their environments), goal attainment (setting and implementing goals), integration (maintaining solidarity within the school), and latency (creating and preserving a unique value system).

In Parsons and his colleagues’ (1953) framework, schools have three different levels of control over the needs: technical, managerial, and institutional. Technical level of the school is about teaching and learning process; managerial level is the internal administrative function of the organization; and institutional level is where a school connects with its environment.

By using the Parsons’ conceptual model, Hoy & Feldman (1987) have developed a new scale called Organizational Health Inventory (OHI) to measure school health. This time, the measure consists of seven dimensions across the three levels of control.

**Institutional level** consists of only one dimension: *institutional integrity* (which is the school’s ability to cope with its environment to maintain its educational integrity of its program). **Managerial level** includes four dimensions: *initiating structure* (which is principal’s behavior that is both task- and achievement-oriented.), *consideration* (which is principal’s behavior that is friendly, supportive, cooperative, and open), *principal influence* (which is principal’s ability to influence the behaviors of superiors), and *resource support* (which is the degree to which teachers have adequate supplies and instruction materials). **Technical level** has two dimensions: *academic emphasis* (which is the extent to which the school is driven by pursuing for academic excellence), and
**morale** (which is a collective sense of friendliness, openness, enthusiasm, and trust among members).

The authors also conducted a second order confirmatory factor analysis to show that the seven dimensions indeed come together to form a single latent factor called organizational health (Hoy & Feldman, 1987). The final 44-items OHI was tested using a sample of 78 secondary schools, and its reliability and validity has been confirmed (Hoy & Feldman, 1987). In this research, the concept of academic emphasis has made its first appearance in the research line of school climate. It has been considered as one aspect of school climate, and its definition and measurement (at secondary school level) has been well established.

Later, in the study conducted by Hoy, Tarter, and Bliss (1990), Organizational Health Inventory (OHI) was compared to another school climate instrument, Organizational Climate Description Questionnaire (OCDQ-RS) (Halpin, 1966; Kottkamp, Mulhern, & Hoy, 1987). Unlike OHI, which is a theoretically grounded instrument, OCDQ-RS is an instrument that was inspired from empirical studies and observations. Both instruments were tested for their predictability of academic achievement and teacher commitment at the secondary level.

58 high schools were included as sample in the study. The results indicated that after controlling for socioeconomic status (SES), OCDQ-RS was not related to student achievement; and only one dimension in OHI, academic emphasis, had significant effect on student achievement after controlling for SES. Therefore, the authors proposed that
principals could have a crucial influence on student achievement by promoting academic emphasis in their schools (Hoy, Tarter, & Bliss, 1990).

One year later, Hoy and his colleagues (Hoy, Tarter, & Kottkamp, 1991) further developed Organizational Health Inventory for elementary schools (OHI-E). After testing on 78 schools, the factor analysis indicated that instead of seven dimensions that had been found in high school level, there are only five dimensions constituted organizational health at elementary level. They are collegial leadership, teacher affiliation, collegial leadership institutional integrity, resource influence, and finally, academic emphasis. The only change in here is the number of dimensions in leadership of principal. In secondary level, principal leadership has four dimensions. However, in elementary level, only the dimension of collegial leadership and resource influence left. Hoy and his colleagues argued that it is because the structure of high schools is much more complicated then elementary schools, the requirement for leadership in secondary schools becomes greater and more complex (Hoy et al., 1991). Furthermore, at the technical level, morale has been replaced by teacher affiliation; however, academic emphasis still remained to be a stable factor at technical level of organizational health for both elementary and secondary schools.

Built on the research of Hoy and his colleagues (1990, 1991) at the elementary and secondary level, Hoy and Sabo (1998) further designed a instrument to measure school health at middle school level called Organizational Health Inventory for Middle Schools (OHI-M). Using data with over 3000 teachers from 87 middle schools, the authors identified that organizational health has six dimensions at the middle school level.
They are teacher affiliation, academic emphasis, collegial leadership, resource support, institutional integrity, and principal influence. This study has also demonstrated that academic emphasis is an important and stable aspect of organizational health at middle school level.

Hoy and Hannum (1997) examined the relationship between organizational health and academic achievement at middle schools. Academic achievement was measured by the results of achievement scores in reading, mathematics, and writing. Correlation and regression analyses showed that except institutional integrity, all of the six dimensions of healthy school climate in middle school were positively and significantly associated with student achievement, even after controlling for SES. However, not surprisingly, among the dimensions of OHI-M, academic emphasis had the largest effect on student achievement \( (r = .73, .70, \text{ and } .64, p < .01, \text{ with achievements in mathematics, reading, and writing respectively}) \). Hoy and Sabo (1998) stated, “Academic Emphasis, Teacher Affiliation, Resource Support, and a negative Institutional Integrity are the key elements of health that foster high student achievement in basic skills” (p.88).

In 2000, Goddard and his colleagues (2000) further examined the relationship between academic emphasis and student achievement at elementary level. By using hierarchical linear modeling (HLM), both school and student level context variables were taken into account. The finding was consistent with previous studies that academic emphasis is highly related student achievement in elementary schools. In a full HLM model, academic emphasis explained 50.4 percent and 47.4 percent of the between–school variability in reading and mathematics achievement respectively. An increase of
one standard deviation in academic emphasis was linked with a increase of 40 percent of a standard deviation in mathematics scores and more than 33 percent of a standard deviation in reading scores. This result showed that academic emphasis is a critical factor on student achievement. Furthermore, because the sample in this study mainly consisted of urban schools which had large percentage of low SES and minority students, it showed that schools with high academic emphasis could have positive impacts on poor and minority students. Thus, a link between academic emphasis and student achievement had also been established in a relatively high-poverty urban school setting. To conclude, up until this research, researchers had confirmed that academic emphasis is a school characteristic that has a significant and positive influence on academic achievement in all three levels of schools (elementary, middle, and secondary) even after controlling for SES.

Besides establishing the relationship between academic emphasis and student achievement, the researchers also try to link academic emphasis with other school variables. Licata and Harper (2001) found a significant relationship between academic emphasis and the robustness of a school’s vision in middle schools. The authors used OHI to measure school climate, and Robustness Semantic Differential Instrument to measure the robustness of a school’s vision. The correlation result indicated that there is a positive and significant relationship between OHI and school vision. In a partial regression analysis, the authors found that institutional integrity and academic emphasis made a significant but separate contribution to the robustness of school vision after
controlling for SES. The authors suggested that healthy school climate could help develop robust school visions and motivate school change.

In 2006, Korkmaz (2006) conducted a research in elementary schools located in Ankara, Turkey. The analysis showed that academic emphasis, collegial leadership, and resource support were the elements in healthy school climate that related with robust school vision. These two studies demonstrated that academic emphasis is consistently related with teachers’ robust school vision.

Hoy, Sweetland and Smith (2002) tested the relationship between academic emphases, collective teacher efficacy, and student achievement. They hypothesized that academic emphasis had a strong and direct influence on collective efficacy and academic achievement. By using 97 secondary schools, the authors confirmed their hypothesis and concluded that academic emphasis affects academic achievement indirectly through collective efficacy. This also means that the study suggested that academic emphasis and collective efficacy are significantly and positively related with each other.

In 2005, Alig-Mielcarek and Hoy (2005) created a model to explain how instructional leadership and academic emphasis affected student achievement. Data were collected from 146 elementary schools. The structural equation modeling analysis suggested that academic emphasis had a positive and significant direct effect on academic achievement. However, instructional leadership was only found to have an indirect relationship with achievement. Therefore, the authors suggested that instructional leadership affects student achievement through academic emphasis.
All the studies discussed previously viewed academic emphasis as an element of healthy school climate. However, there are two other approaches to investigate academic emphasis: Effective school research (Murphy, Weil, Hallinger, & Mitman, 1982; Shouse, 1996; Phillips, 1997), and Lee & Bryk’s Catholic high schools research (Lee & Bryk, 1989, 1999). The studies in these two routes shared a similar definition for academic emphasis with school health research, which is the degree to which the members in a school emphasize the importance of student achievement. Their research also confirmed that academic emphasis has a direct and positive relationship with academic optimism (Lee & Bryk, 1989, 1999; Shouse, 1996). However their measurements are different from school health studies. The measures that used in effective school research and Bryk’s Catholic high schools studies were borrowed or extracted from the existed database such as NELS survey or Consortium for Chicago School Research. However, in studies that stemmed from school health research, the instruments they used were a subscale in OCI that was created to tap academic emphasis specifically. Because the measurement of a concept can highly affect its relationship with other variables, and that academic emphasis used in the context of academic optimism was from school health research, only research of academic emphasis that stemmed from healthy school research were mentioned in this review.

In sum, previous studies on academic emphasis have revealed a constant, strong, and positive relationship between academic emphasis and student achievement at the elementary (Goddard, Sweetland, and Hoy, 2000; Hoy et al., 1991), middle (Hoy & Hannum, 1997; Hoy & Sabo, 1998), and secondary schools (Hoy et al, 1990; Hoy et al.,
Therefore, academic emphasis is an important school variable that has been linked with academic achievement at every school level.

**Academic Optimism as a Single Construct**

Collective teacher efficacy, faculty trust in clients, and academic emphasis were all been confirmed to have strong and positive relationship with academic achievement, even after controlling for socioeconomic status. One would think that when putting all three variables in one single regression model, we could explain a much larger amount of student achievement variance among schools. However, that is not the case because the problem of multicollinearity would occur due to the high correlations between the three variables (Hoy, 2012). The high correlations between collective teacher efficacy, and faculty trust in clients, academic emphasis led Hoy and his colleague to wonder if there was a common theoretical basis for these three collective school properties?

After review the literatures, Hoy, Tarter, and Woolfolk Hoy (2006b) found that there were many commonalities among the three school characteristics. They all are collective emergent school properties; they all influence and shape the normative and behavioral environment of a school; and they all are highly correlated with each other. Therefore, Hoy and his colleagues theorized that there exists a single latent construct which is formed through the integration of these three school properties (Hoy et al., 2006b). With a sample of 3,400 teachers in 146 elementary schools, Hoy and his colleagues performed a second factor analysis to test their hypothesis. The high factor loadings on each of the three dimensions on academic optimism and a good overall model fit supported their hypothesis that collective teacher efficacy, and faculty trust in
clients, academic emphasis are three separate aspects of a single, latent school variable called academic optimism.

Hoy and his colleagues (2006b) suggested that collective teacher efficacy, faculty trust in clients, and academic emphasis represent the cognitive, affective, and behavioral aspects of the optimistic. Collective teacher efficacy represents the thoughts and beliefs of teachers, thus it is cognitive part; faculty trust represents the feelings of teachers toward their clients, thus it is the affective part; and academic emphasis represents to what extent teachers embodying the behaviors that arose from collective efficacy and trust, thus it is the behavioral part. Hoy et al. (2006b) suggested that these three dimensions were mutually dependent and reinforced each other in a triadic reciprocal fashion. This reciprocal relationship among the three dimensions was illustrated in Figure 2.3.
From the figure above, we can see that when collective trust is high between faculty and clients (students and parents), it facilitates collective efficacy because teachers believe that parents and students are more willing to cooperate with them to pursue academic success. High collective efficacy would also facilitates trust because when collective efficacy increased, teachers view themselves as more capable of handling problems, thus, they are more willing to be vulnerable to their clients. Similarly, when the faculty trust their students and parents, teachers believe that they can insist higher achievement standards without fear that parents would undermine them. In turn, emphasis on high academic standards reinforces faculty trust in clients when students
show improvement in academic achievement. Finally, collective efficacy would increase academic emphasis because when teachers believe that they can organize and execute actions needed to improve student achievement, they will stress academic achievement. And when this stress in academic achievement shows improvement in student learning, collective efficacy would in turn be encouraged. Therefore, we can see that the three aspects of academic optimism are in transactional relationships with each other. This interaction shapes the normative environment of a school and creates a culture of academic optimism. Hoy and his colleagues (2006b) suggested that “when academic optimism is high, school norms encourage teachers to believe that students could learn, to have confidence that successful teaching strategies could be found, to persist in the face of obstacles, to have a consistently trusting attitude toward students and parents, and to focus on high standards and rewarding academic achievement.”

The notion of optimism was originated from the work of Seligman (1998). Seligman argued that besides the traditional view of the two factors of success: talent and motivation, there is a third factor of success: optimism. Optimism can be described as an overarching mental state wherein people believe that things will more likely go well rather than go wrong. Thus, the term “optimism” suggests learning possibilities and that pessimistic can be changed. Hoy and his colleagues (2006b) believes that collective efficacy, faculty trust in clients, and academic emphasis captured the essence of optimism, and therefore, they chose academic optimism as the term for this new construct.

Later, a second study conducted by Hoy et al. (2006a) demonstrated how academic optimism could make a difference in academic achievement when SES,
previous achievement, were controlled. In this research, three valid and reliable instruments were administrated to teachers from 96 high schools to measure levels of each school properties. Academic emphasis was measured by items from Organizational Health Inventory (OHI) (Hoy & Tarter, 1997; Hoy et al., 1991), collective teacher efficacy was determined by the Collective Efficacy Scale Short Form (Goddard, 2002; Goddard et al., 2000, 2004), and faculty trust in clients was measured by items from Omnibus Trust Scale (Hoy & Tschannen-Moran, 2003).

The authors proposed a theoretical model in which SES and previous achievement had direct effects on academic achievement, and also had indirect effects on student achievement through academic optimism. The theoretical model of this study is demonstrated in Figure 2.4.
Figure 2.4: Theoretical Model of Academic Optimism and School Achievement Proposed by Hoy, Tarter, Woolfolk Hoy (2006a, p.433)

Structural equation modeling analysis was adopted to examine the hypotheses of the study. The results confirmed that academic emphasis, collective efficacy, and collective trust in students and parents formed a single latent construct called academic optimism. The results also showed that academic achievement was related to academic optimism after controlling for SES, and previous student achievement; and that SES and previous achievement made both direct contributions and indirect contributions through academic optimism to student achievement. This study indicated that academic optimism is a strong force for academic achievement in secondary school level. Also, this study has
created a valid and reliable measurement instrument for academic optimism, School Academic Optimism Scale (SAOS).

The powerful effect of academic optimism on student achievements had also been confirmed at elementary school level. Smith and Hoy (2007) used multiple regression analyses to examine the data collected from 99 urban elementary schools in Texas. The results indicated that academic optimism is a general construct composed of collective teacher efficacy, faculty trust in parents and students, and academic emphasis; and it predicted student achievement in urban elementary school setting even after controlling for socioeconomic status and school size. Because urban schools are the groups that suffer most from the higher percentage of minority and low socioeconomic status students, the result is encouraging that through nurturing academic optimism, academic success is still achievable and reachable (Smith & Hoy, 2007).

McGuigan and Hoy (2006) examined the relationship between enabling school structure with academic optimism at elementary schools. The path analysis indicated that there is a positive relationship among academic optimism and enabling school structure. However, a relationship between academic optimism and value added gain index measures of achievement was not identified. The study demonstrated that principals who were able to develop school structure in which the rules, policies, and procedures enabled the basic teaching and learning mission could foster the culture of academic optimism in their schools. The importance of this result is that it put school principals back into the discussion of school improvement.
Smith (2008) seeks to cross-validate the construct of academic optimism of school proposed by Hoy et al. (2006a) on an independent sample. However, the result showed only partial support to previous research. After conducting a factor analysis, the author found that only academic emphasis and trust were loaded on the same component, while collective efficacy loaded on another. However, there are some major issues in its methodology that might undermine the creditability of the research. First, the author used the whole OHI instrument to measure academic emphasis. Therefore, instead of measuring academic emphasis, he ended up measuring the whole construct of school health. Secondly, though the author claimed that he was investigating academic optimism of school, he never aggregated the data he collected into school level. Instead, the author just analyzed them in individual form. With these two issues, the result of this research is questionable.

Wagner (2008) investigated the relationship between academic optimism and its relationship with organizational citizenship behaviors of teachers and student achievement. A convenience sample of 36 public Virginia high school serving students in grades 9-12 was used. The measurement for academic optimism and organizational citizenship were all took from existing instruments. The initial factor analysis again confirmed that academic optimism is a unified construct comprised of three dimensions: collective efficacy, academic emphasis, and faculty trust in students and parents. Correlation analysis showed that there is a strong and positive relationship between organizational citizenship and academic optimism ($r = .83, p < .01$). Additional multiple regression analysis confirmed that academic optimism had a strong and positive
relationship with student achievement after controlling for SES. However, the effect of organizational citizenship on academic achievement has become non-significant after including both academic optimism and SES in the equation.

Kirby (2009) examined the relationship between academic optimism and community engagement, which is an element of school climate that examines the cooperative strategies that schools employ to foster positive and constructive relationship with the community members. 1,292 Teachers from 35 public elementary schools in Norfolk, Virginia, primarily serving grades PK-5 participated in the study. Correlation analysis showed that there was a significant relationship between community engagement and academic optimism ($r = .70, p < .01$). There also existed a significant relationship between academic optimism and student achievement on statewide math and reading assessments in grades three, four, and five, as well as community engagement and student achievement. Further multiple regression analysis revealed that when community engagement and the three aspects of academic optimism were added to the equation, it explained 62% of the variance in student achievement.

Kirby and DiPaola (2009) further explored the relationship between academic optimism and community engagement in secondary level. 36 public high schools (grades 9-12) across the state of Virginia participated in the study. In this study, the authors developed a path model to illustrate the relationship between academic optimism, community engagement, and student achievement after controlling for SES. In their model, academic optimism was the mediator variable, acting as a source for student achievement and a result of community engagement. The results showed that community
engagement predicted academic optimism ($\beta = 0.60, p < 0.01$), and academic optimism in turn predicted academic achievement in Biology ($\beta = 0.52, p < 0.05$) and History ($\beta = 0.44, p < 0.05$), after controlling for SES. The results also indicated that the influence of academic optimism on student achievement is larger than the influence of SES. This study provided evidence that mobilizing community and forming partnerships with schools can have a positive impact on student achievement through affecting academic optimism of a school. The result was also encouraging because it shows that it is possible for administrators to make a change in academic optimism.

Rutledge (2010) explored the relationship between transformational leadership and academic optimism. The author adopted Leithwood’s model of transformational leadership in this study (Leithwood, Aitken, & Jantzi, 2006; Leithwood, Jantzi, & Steinbach, 1999). Leithwood defines transformational leadership as a form of “principal leadership that moves individuals toward a level of commitment to achieve school goals by setting direction, developing people, redesigning the organization, and managing the instructional program” (Leithwood et al., 2006). This study theorized that transformational leadership and academic optimism would be positively correlated. Leithwood’s school leadership survey was used to measure transformational leadership, and the school academic optimism survey (SAOS) was used to measure academic optimism. The results of correlation testing indicated that Leithwood’s model of transformational leadership is positively related to the academic optimism of the school ($r = 0.48, p = < 0.01$). The linear regression analysis showed that the combined influence of the categories of transformational leadership explains about 23% of the variance in
academic optimism (adjusted $R^2 = .23$). The result demonstrated that principal’s transformational leadership could influence the culture of academic optimism in a school.

The construct of academic optimism has also been identified at both teacher and student levels. At teacher level, similar to the academic optimism at school level, it is also a construct comprising three components: individual teacher efficacy, teacher’s sense of trust in his/her students and parents, and teacher’s sense of academic emphasis. They represent the cognitive, affective, and behavioral aspects of individual teacher’s academic optimism (Beard, Hoy, & Woolfolk Hoy, 2010; Fahy, Wu, & Hoy, 2010; Woolfolk Hoy, Hoy, & Kurz, 2008). Academic optimism has also been confirmed at student level (Adams & Forsyth, 2011), and the three components became student academic self-efficacy, student trust in teachers, and student perceptions of home academic press. Though, the effect of individual level academic optimism on student achievement has never been researched, it is reasonable to assume that there is a strong relationship between these two variables judging from the theoretical basis and previous research at school level (Woolfolk Hoy, Hoy, & Kurz, 2008).

In conclusion, the construct of academic optimism has been confirmed to have a strong and positive relationship with student achievements at both elementary and secondary school level, even after controlling for SES and previous student achievement (Bevel, 2010; Edwards, 2010; Fallon, 2010; Kirby, 2009; Kirby & DiPaola, 2009; McGuigan & Hoy, 2006; Reeves, 2010; Wagner, 2008). However, there were only four other variables that have been identified to have relationship with school academic optimism. They are enabling school structure (McGuigan & Hoy, 2006), community
engagement (Kirby, 2009; Kirby & DiPaola, 2009), organizational citizenship behaviors of teachers (Wagner, 2008), and principal’s transformational leadership (Rutledge, 2010). In order to know how can we improve the culture of academic optimism at school, more studies are needed on what other school factors that could influence academic optimism in a school.

**Collective Responsibility**

In the following paragraphs, the research related to collective responsibility for student learning were discussed.

Lee and Smith (1996) were the first researchers who attempted to conceptualize collective responsibility and to investigate its effect on student achievement. In this study, their concept of collective responsibility stemmed from the research of teachers’ expectations and attitudes for students. However, instead of using a psychological framework like most studies in teacher expectations, they adopted a sociological framework to “expand the notion of teachers’ expectations for students to the larger context of a school culture centered around expectations” (p.109).

In this sense, they expanded a psychological notion, “expectations for learning”, to a sociological one which they called “responsibility for learning”. Therefore, they viewed collective responsibility as a set of school norms that reflect teachers’ attitudes for their students (Lee & Smith, 1996). Lee and Smith (1996) defined collective responsibility for learning as “teachers’ willingness to take responsibility for the learning of their students based on the degree to which faculty feels that teaching is worth the
effort”. Therefore, in their perception, teachers’ attitude for students is similar to collective teacher efficacy: teachers feel that teaching is worth the effort.

Lee and Smith (1996) also theorized about how collective responsibility influences student learning. First, when a school’s teachers believe that their efforts are effective in improving student learning (high collective efficacy), teachers will increase their efforts in teaching spontaneously. Thus, result in improved student learning. Second, when teachers assume responsibility for all students’ learning, teachers are more willing to focus on helping students who are left behind or in poverty. Thus, learning might be more equitably distributed among all students in the school (Lee & Smith, 1996, p. 110-111).

The concept of collective responsibility describes schools on a continuum based on average teacher attitudes. On one end of the spectrum, we would find schools where most teachers take personal responsibility for the success or failure of their own teaching. At this end, teachers would see teaching and learning as an interactive process. Students are being viewed as active learners, rather than as passive ones who only perceive one-way flow of knowledge from teachers (Brattesani, Weinstein, & Marshall, 1984). On the other side of the continuum, we would find schools where most teachers only see potential obstacles in their teaching and learning process, such as the low family background, and the lack of student ability and learning motivation. If students do not learn well, these teachers would tend to locate the fault for low student achievement outside of themselves and their own teaching (Lee & Loeb, 2000).
Lee and Smith (1996) viewed collective responsibility as an aggregate organizational property; therefore, it was measured as the school mean of teachers’ individual responsibility. Their measurement of collective responsibility was drawn from National Educational Longitudinal Study (NELS) teacher questionnaire using factor analysis to guide the construction of each composite (Lee & Smith, 1996). Twelve items were highly correlated to form one coherent factor.

By using descriptive analysis, one way ANOVA, and hierarchical linear modeling (HLM) approach, the results indicated that students showed significant gains in achievement in four subjects (mathematics, science, reading, and social studies) over the first 2 years in schools with higher levels of collective responsibility and more consistency among teachers in the same school in these attitudes. Furthermore, they also found that learning was distributed more equitably by students' social class in schools with higher levels of collective responsibility (Lee & Smith, 1996). These conclusions implied that collective responsibility for learning is an important school property that would significantly influence student achievement, despite the effect of socioeconomic status.

Based on the same assumptions and concept of collective responsibility, Lee and Loeb (2000) further investigated whether the size of school can influence the school’s collective responsibility for learning and academic achievement. This study also took the effects of student, teacher, and school characteristics into account.

The measures and the data they used were from the survey conducted by the Consortium on Chicago School Research in 1997. A sample of 4,495 teachers and 22,599
6th and 8th grade students from 264 Chicago elementary schools were incorporated in the research. The authors employed hierarchical linear modeling (HLM) approach to test their model.

The results showed that compared with medium or larger schools, small schools (enrolling fewer than 400 students) tend to have higher sense of collective responsibility and student achievement. The study also concurred with previous research that higher collective responsibility is positively related to student achievement even after controlling for school demographics and previous achievement. The authors argued that because smaller schools facilitate more personalized interactions among its members, teachers tend to know their students better and care more about them. By more closely related to their students, teachers are more likely to worry more about students’ failures, provide more help directed toward improvement, and thus, assume more responsibility for students learning. Moreover, because there are less faculty members in small schools, collective responsibility is easier to be formed because there are less people to be involved. Therefore, Lee and Loeb concluded that school size has a direct relationship with collective responsibility. The authors further concluded that school size influences student achievement directly and indirectly through its effect on collective responsibility (Lee & Loeb, 2000).

Later, LoGerfo (2004) investigated the notion of both individual teacher responsibility and collective responsibility in elementary schools, especially on first-graders. A nationally representative sample included 697 schools with 2,390 first-grade teachers and 9744 first-graders was used in this study. Unlike previous research at
secondary level, the results from HLM analysis demonstrated that after individual responsibility is accounted for, the effect of collective responsibility on first-grade’s reading achievement was not significant. LoGerfo explained that the finding might just reflect the structural differences between secondary schools and elementary schools. Whereas many different teachers teach secondary students, younger students tend to interact with the entire school through only one teacher (LoGerfo, 2004). Also, the author found that socially disadvantaged children were less likely to have highly responsible teachers. However, she found that teachers are more willing to accept responsibility for children if they teach in Catholic schools or perceive supportive school leadership, after controlling socioeconomic factors of students. The findings indicated that though teacher responsibility is related with student SES, it is still possible to be nurtured by other school properties.

By using the dataset from a national research project, Learning from Leadership, Wahlstrom and Louis (2008) further explored how collective responsibility influenced teachers’ classroom instructional practices. To address their questions, they used stepwise linear regression models. A sample of 4,165 respondents from K-12 teachers across the United States was used in the research. The results indicated that collective sense of responsibility was positively related with shared leadership and teacher-principal trust. In addition, collective responsibility was also linked with three different instructional practices: focused instruction, standard contemporary practice, and flexible grouping practices. However, compared with other teacher-teacher relationship variables, such as
shared school norm, the study showed that collective teacher responsibility was not as influential as in previous research.

Up until then, only a handful of studies have been conducted on collective teacher responsibility, however, they all suffer from two major flaws. First, the definition and the meaning of collective responsibility were not specified clearly (Lee & Smith, 1996; Lee & Loeb, 2000; Wahlstrom & Louis, 2008). The poor definition of collective responsibility leads to confusion with other concepts, especially with collective efficacy. For instance, Lee and Smith (1996) viewed collective responsibility as the same as collective efficacy, while Wahlstrom and Louis (2008) viewed collective responsibility as the indicator of collective efficacy. Second, the measurements for collective responsibility were weak. Measurements used in the research reviewed in previous paragraphs were all generated from secondary datasets which were not meant to measure collective responsibility when they were created. This results in low validity and reliability of the instruments. To make things worse, the researchers all used different datasets from different sources, so the results were not comparable between studies. These two major problems might be the reason why the effect of collective responsibility and its relationship with other constructs varied across different research. Therefore, a more specified definition and a better operational measure of collective responsibility are needed.

LoGerfo and Goddard (2008) conducted a study to address these two issues. First, they specified the meaning of responsibility. They defined teacher responsibility as “teachers willingness to accept responsibility for their students’ outcomes” (LoGerfo &
Goddard, 2008, p.77). They focused on teachers’ “willingness”, thus, “unlike general teaching efficacy, responsibility is not a belief in whether teaching as an activity can affect students. Unlike personal teacher efficacy, reasonability is not a teacher’s self-assessment of pedagogical effectiveness. Unlike locus of control, responsibility is not simply an attribution of cause to internal or to external factors. Responsibility is the willingness to take action, once the locus of control has been assigned to internal factors and efficacy beliefs formed” (LoGerfo & Goddard, 2008, p.77). This definition implies that when a teacher has a high level of efficacy and internal locus of control, it is more likely that he/she will assume a higher level of responsibility for his/her students. However, this also indicate that even when a teacher has a high level of efficacy and an internal locus of control, it doesn’t necessary mean that the teacher will accept more responsible for his/her students. If teachers don’t feel the needs of struggling children and accept the responsibility for student learning as part of their role as a teacher, the sense of responsibility will probably remain low and they will not exert as much effort. In other words, efficacy is more like teachers’ feeling “I believe I have the ability to help students to learn”, and responsibility is more like “I want to help students to learn, no matter what obstacles I might face”. Efficacy refers to ability whereas responsibility refers to the will.

The authors also argued that teacher responsibility and collective responsibility are distinct but related constructs, therefore the two constructs should be positively and reciprocally linked. They stated that collective responsibility is an aspect of school culture that emerges from “shared values, shared beliefs, and a common goal among school administration and faculty” (LoGerfo & Goddard, 2008, p.78). Just like collective
efficacy, its an emergent school variable. Therefore, collective responsibility is not simply the average of individual teacher’s responsibility within a school. It’s part of a “normative school environment communicated by expressed beliefs and perceived practices” (p. 78). In sum, teacher responsibility is a teacher level attitude about one’s own work and students, while collective responsibility is an aspect of school culture or ethos that shows the entire faculty is willing to assume responsibility for student learning.

By distinguishing the difference between individual and collective responsibility, the authors developed a new instrument for collective teacher responsibility. Unlike previous measures that usually phrased the questions in terms of the individual and then aggregated to the school as an average, the authors specifically constructed items to directly reference the school as a whole by using group-referent phrasing (i.e., “teachers in my school…”). Respondents were asked to report the level of responsibility they perceived among their colleagues. This approach was suggested by Goddard and LoGerfo (2007) because it could reflect the prevailing attitudes and beliefs of a group more accurately. The measure was comprised of 6 Likert type items on a five-point scale. Sample items included “Teachers in my school take responsibility for improving the school”, “Teachers in my school are willing to take responsibility for all students’ learning”, and “Teachers in my school feel responsible when students in our school fail”.

A random sample of 76 elementary schools from one large Midwestern state were included to test the reliability and validity of the measurement. The results of factor analysis (factor loadings for each item ranges from .690 to .849) and Cronbach’s alpha (α = .85) indicates that their measurement for collective responsibility is fairly reliable. Its
significant relationship with teacher collegiality, school trust, and mathematics achievement also showed an adequate concurrent and predictive validity of their instrument (LoGerfo & Goddard, 2008). The authors also conducted an HLM analysis. The results were the same as previous research; they showed that collective responsibility was positively and significantly related to elementary students’ mathematics achievement.

In conclusion, this study has specified the meaning of collective responsibility, created a solid and reliable measurement for it, and demonstrated its relationship with student achievement in elementary schools.

From previous research on collective responsibility, the following conclusions can be made. As for the meaning of collective responsibility, it is the extent to which teachers in the school accept responsibility for all students learning (LoGerfo & Goddard, 2008). However, it shouldn’t been viewed simply as the indicator of collective efficacy nor the average of individual teachers’ responsibility for their own students. Instead, it should be conceived as a dimension of school culture that is derived from shared values, shared beliefs, and a common goal among faculty. It is a part of a normative school environment that can influence teachers’ behaviors through expressed beliefs and perceived practices (Lee & Smith, 1996; Lee & Loeb, 2000; LoGerfo & Goddard, 2008).

As for the measurement of collective responsibility, previously, it was measured with teacher-level items aggregated to the school-level. However, since collective responsibility has been defined as an emergent organizational property, research suggests it should be measured with group-referent responses instead of self-referent responses to get a more accurate and valid result (Goddard & LoGerfo, 2007). It was not until 2008
that LoGerfo and Goddard (2008) have created a reliable and valid measurement for collective responsibility. In this research, we adopted LoGerfo and Goddard’s questionnaire to measure collective responsibility.

As for the relationship between collective responsibility and student learning, the research suggests that it is positively and significantly associated with student achievement in both elementary and secondary level. A higher level of collective responsibility is associated with more students learning. Furthermore, collective responsibility is related to greater educational equity among students. In schools with higher levels of collective responsibility, the disadvantage of family and school background was weaker (Lee & Smith, 1996; Lee & Loeb, 2000; LoGerfo, 2004; 2006; Goddard & LoGerfo, 2008).

In conclusion, collective responsibility represents teachers’ willingness to accept responsibility for all students’ learning (LoGerfo & Goddard, 2008). Previous quantitative research suggested that collective responsibility has a direct and positive relationship with student achievement (Lee & Smith, 1996; LoGerfo, 2006; LoGerfo & Goddard, 2008). Further, research also pointed out that teachers’ collective responsibility has no significant relationship with SES, and it could close the learning gap between high SES and low SES students in a school (Lee & Smith, 1996; Lee et al., 1997; LoGerfo & Goddard, 2008). Therefore, collective responsibility is an important school characteristic that needed to be further studied.
**Rationale for Theoretical Model and Hypotheses**

This research tests a model of how collective responsibility and academic optimism influences student achievement in elementary schools in Taiwan. The model suggests that collective responsibility is directly related to academic optimism and student achievement, and academic optimism is directly related to student achievement, while socioeconomic status is controlled. The path model is illustrated in Figure 2.5.

![Path Model for the Relationship Between Collective Responsibility, Academic Optimism, and Student Achievement](image)

Figure 2.5: Path Model for the Relationship Between Collective Responsibility, Academic Optimism, and Student Achievement
The model presented can be broken into the following four hypotheses:

Hypothesis 1. Academic optimism is a single, latent trait of schools that is manifested through collective efficacy, academic emphasis and trust in Taiwan elementary schools.

Theoretically, Hoy and his colleagues (2006b) stated that collective teacher efficacy, faculty trust in clients, and academic emphasis are related with each other in a triadic set of relationship. Each factor will affect the other two and vice versa. Because the three factors are highly correlated with each other, Hoy et al. (2006b) believed that they work together in a unified fashion to create a positive academic school culture named academic optimism. This theoretical statement has been confirmed in many empirical studies (Hoy et al. 2006a; Smith & Hoy, 2007). These studies demonstrated that academic optimism is a single latent construct comprised of collective efficacy, academic emphasis, and faculty trust in students and parents. Each one of them represents a different aspect of academic optimism: collective efficacy represents the cognitive part; faculty trust represents the affective part; and academic emphasis represents the behavioral part. Because this hypothesis has both strong theoretical and empirical backups, it is reasonable to postulate that the statement would still be true in Taiwan schools.

Hypothesis 2. Academic optimism has a direct and positive relationship with student achievement, after controlling for SES.

Hoy and his colleagues (2006a) theorized that because a culture of academic optimism would shape school norms and teachers’ behaviors to focus more on pursuing academic success, academic optimism should be highly correlated with student outcome.
This statement has been tested in many empirical studies and they all showed that there is a direct and strong relationship between academic optimism and student achievement (Hoy et al., 2006a; Kirby & DiPaola, 2009; Smith & Hoy, 2007; Wagner, 2008). In some of these studies, the effect of academic optimism on student achievement had been found to be even larger than the effect of SES on academic achievement. Because both theoretical rationale and empirical evidence are plausible, the phenomenon is highly likely to exist across different culture settings. Therefore, it is reasonable to assume that academic optimism is directly related with student achievement in Taiwan schools, even after controlling for SES.

**Hypothesis 3.** Collective responsibility has a direct and positive relationship with student achievement, even after controlling for SES.

Previous research has documented that when collective teacher responsibility is high, teachers will generally have higher expectations for all of their students, give more challenging work to students, and adjust their instructional practices to meet students’ needs (Diamond, Randolph, & Spillane, 2004). The increase in collective teacher responsibility should result in more students learning, and thus, increase overall student achievement. This direct and positive effect of collective responsibility on student achievement has been examined in numerous studies (Lee & Smith, 1996; Lee & Loeb, 2000; LoGerfo, 2006; LoGerfo & Goddard, 2008). And this effect has been confirmed existed in both elementary (LoGerfo, 2006; LoGerfo & Goddard, 2008) and secondary schools (Lee & Smith, 1996). Theoretically, there are no reasons to believe that culture difference would affect how collective responsibility influences student learning.
Therefore, we expect that collective responsibility would be positive related with student achievement in Taiwan at elementary level, even after controlling for SES.

Hypothesis 4. Collective responsibility has a direct and positive relationship with academic optimism.

The hypothesized association between collective responsibility and academic optimism has never been tested in neither U.S. nor Taiwan schools. However, some research indicated that collective responsibility would enhance each of the three dimensions of academic optimism.

The link between collective responsibility and collective efficacy has been empirically established in the research conducted by LoGerfo & Goddard (2008). The correlation analysis showed that there is a strong and positive relationship between collective responsibility and collective efficacy ($r = .497, p < .001$). It is not hard to imagine that there is a relationship between collective responsibility and collective efficacy. When teachers have strong sense of collective efficacy, they would feel that they have the ability to make a difference on students, and it would be easier for them to assume responsibility for student learning.

The direction could go the other way too, if principals in a school could persuade teachers to internalize and assume responsibility for all student learning, teachers would be willing to accept any challenge they face with hard to reach students. They would have a stronger desire and resilience to learn new teaching or classroom techniques, and thus, enhanced in their sense of collective efficacy (Gant, 2010).
The link between collective responsibility and trust in students and parents has also been empirically confirmed by LoGerfo and Goddard (2008). They used trust in students and parents to test the concurrent validity of collective responsibility because in previous studies, both concepts show strong link with academic achievement. The correlation analysis showed that there is a significantly and positively relationship between collective responsibility and trust in clients (r = .398, p < .001).

Theoretically, it is also easy to imagine how collective responsibility could enhance teachers’ trust in students and parents. When teachers are willing to take more responsibility for all students, they would be more willing to risk vulnerability to their students because they were more ready to accept any consequences results from it. Because willingness to risk vulnerability is the precondition for the development of trust (Tschannen-Moran & Hoy, 2000), collective responsibility becomes the trigger for faculty trust. In addition, accepting more responsibility could also means that the teachers would become more benevolent, reliable, and open to students and parents than before. When students and parents sense the change in teachers, they would also in turn trust teachers more, and therefore a reciprocal trust relationship would then be formed and enhanced.

The positive relation between collective responsibility and academic emphasis also seems likely. Empirically, the relationship between collective responsibility and academic emphasis has never been examined quantitatively; however, there is a qualitative study that supported this hypothesis (Diamond & Spillane, 2004). In this study, the authors conducted an ethnographic research on five urban elementary schools to
examine how teachers’ expectation on student and micro-political context (such as teachers’ assessment of students and their collective responsibility for student learning) would affect teachers’ behaviors. The authors documented that in schools that teachers accepted high responsibility for student learning, “they encourage students, push them to excel, and adjusted their instructional practices to meet students’ needs (p. 88)” . In contrast to these schools, teachers in schools that had low collective responsibility reported that “they evaluated student work less critically, gave student less challenging work, resisted instructional innovation, and emphasized highly structured classroom work (p.88)”. 

Diamond et al. (2004) argued that when collective responsibility was high, academic emphasis in the school was also strong. In schools with high collective responsibility, teachers treated students as capable learners, gave them challenging work, and pushed them to achieve academically. In school with low collective responsibility, teachers treated students as passive learners, gave them less challenging work, and expected students to be low-achievers.

The above passages have shown that both empirically and theoretically, collective responsibility was positively related with each of the three components in academic optimism. Because academic optimism is a school culture variable that has been created by the interaction between collective efficacy, faculty trust in parents and students, and academic emphasis, it is reasonable to assume that collective responsibility is also directly and positively related with academic optimism.
In conclusion, in this research, we presented a structural equation model to examine the relationship between collective responsibility, academic optimism, and student achievement. We hypothesized that academic optimism should be a single latent construct that comprised of three elements (collective efficacy, trust, and academic emphasis), that collective responsibility is directly related to academic optimism and student achievement, and that academic optimism is directly related to student achievement, while socioeconomic status is a control variable.
CHAPTER 3

METHODOLOGY

Academic optimism and collective responsibility are school characteristics that have been positively associated with student achievement in U.S. schools (Hoy, Tarter, & Woolfolk Hoy, 2006; Smith & Hoy, 2007). This study sought to test previous findings, as well as to extend the research in elementary schools in Taiwan. The purpose of this study was to examine relationships that exist among academic optimism, collective responsibility, and student achievement. It is hoped that this study could provide some quantitative evidence with implications to research and practice leading to a better understanding of the social processes in school that influence student achievement.

In the following paragraphs, the methodology used to answer the research questions in this study are provided. Population, sample size, data collection process, survey instrument, pilot study process, and the statistical methods adopted were explained in the following paragraphs.

Sample

The population of interest for the present study was the elementary schools within Hualien County, Taiwan. From a total of 104 public elementary schools in Hualien, except for one that didn’t respond to our contact, 103 of the 104 schools were included in our sample. Almost every public elementary school in Hualien County was included;
therefore the sample was a great representative of the population. However, because Hualien County doesn’t have metropolitan city (which has over 1 million residents), caution should be used when generalizing the results to other counties in Taiwan.

Among these 103 elementary schools, most of them have small faculty. There are 69 schools with less than 11 teachers (The least number of teachers in a school is 9), 18 schools had between 11~20 teachers, 7 schools had between 21~30 teachers, 4 schools had between 31~40 teachers, and 5 schools had more than 40 teachers. In total, there are 1,571 teachers in these 103 elementary schools.

In order to get representative collective teacher attitudes for each school, for schools with 10 teachers or less, survey data were collected from all teachers. In schools with more than 10 teachers, data were collected from a random sample of approximately 50 percent of the teachers, but always from at least 10 teachers. A total of 1200 questionnaires were distributed to elementary school teachers across the county; and 1095 valid responses were collected. The high response rate (91%) implies that the data collected are highly representative. There were at least 5 valid teacher responses of the questionnaire from each school; therefore, all 103 schools were included in the final sample.

**Data Collection Process**

The superintendent of Hualien County was contacted to solicit permission for the elementary schools in the county to participate in this study. Then the researcher contacted the principal of each elementary school either by phone or in person to ask for consents to collect data from teachers in their schools. Once the administrators from both
levels approved, the researcher collected data for academic optimism and collective responsibility from elementary teachers in the sample at their school faculty meetings.

The entire survey instrument takes around 20 minutes to complete. Each respondent was guaranteed anonymity, confidentiality, and the option to refuse participation. Teachers were also asked not to identify themselves in any way on their questionnaires. In addition, because all teacher data were aggregated to the school level, no individual teacher can be identified. Furthermore, in order to protect participated schools, real school names will not be linked with school level data and included in the final report.

Data for 2011 on school SES and school academic achievements were collected from the Hualien Department of Education. School SES was measured by the percentage of students received free lunch in each school. School academic achievements were measured by the average scores of The Basic Competence Test for Hualien Elementary School Students of both fifth and sixth graders in Chinese and Mathematics.

**School Socioeconomic Status**

The percentage of students who received free lunch for each school in 2011 was used to measure school socioeconomic status. This widely available statistic is a very common measure of socioeconomic status for educational research purposes. Because household income is the main criteria for whether the student could receive free lunch, it is likely that the percentage of students who received free lunch is a valid indicator for socioeconomic status. Further, because whether a student should received free lunch in Taiwan also incorporated teacher’s judgment on whether a student’s family is poor
enough to be eligible for free lunch, the rate should reflect socioeconomic status more accurately. Schools with fewer students who received free lunch were considered to be schools with higher school socioeconomic status and vice versa. For this study, the data were received from the Hualien Department of Education.

**Student Achievement of Schools**

Academic achievement for schools were measured by the average scores of The Basic Competence Test for Hualien Elementary School Students of fifth and sixth graders in both Chinese and Mathematics of year 2011. These measures served as the outcome variables in our structural equation model. Students completed the assessments approximately two months after the faculties complete our survey.

**Survey Translation Process**

The English versions of the instruments for both constructs were developed from previous studies by experienced researchers. In this study, we kept every item from both SAOS and Collective Responsibility Scale, and translated them into Chinese version.

During the translation of the survey, a linguist from National Dong Hwa University was included to make sure that our translation captured the original meaning of the English surveys. Further, in order to be sure that the recipients understood the questions as the same as the researcher did, the researcher individually interviewed ten elementary school teachers in Hualien (conveniently selected) about how they understood each of the questions in the surveys.

During the interview, each teacher was asked to read and complete 6 items from the whole survey. Then, the researcher would ask each teacher about how they conceived
each question and how they came up with their answers. If teachers understood the questions differently from the researcher, the researcher would discuss with them how to improve descriptions to make recipients understand the questions as the same way as the researcher does. The revised survey was then finalized after being checked by the researcher and the linguistian again to make sure that the wording was concise and correct. The results of the interviews led both the researcher and the linguistian to conclude that the translation of the questionnaire was accurate and understandable by the elementary teachers in Taiwan.

**Survey Instruments**

There were four primary school level variables in this study: collective efficacy, collective trust, academic emphasis, and collective responsibility. The data for the study consisted of responses to survey items. School Academic Optimism Survey (SAOS; Hoy et al., 2006) was used to measure collective efficacy, collective trust, academic emphasis, which are indicators of academic optimism. Collective Responsibility Scale (LoGerfo & Goddard, 2008) was used to measure collective responsibility. Prior to analysis, negatively worded items were all reverse coded, thus in each case, the higher the score, the higher the level of the construct under study.

*School Academic Optimism Survey (SAOS)*

Academic optimism was operationally defined using the SAOS, which is a combination of three subscales: Collective Efficacy Scale Short Form (Goddard, 2002), faculty trust in clients subscale in Omnibus Trust Scale (Hoy & Tschannen-Moran, 2003), and academic emphasis subscale in Organizational Health Inventory (Hoy, Tarter, &
Kottkamp, 1991; Hoy & Sabo, 1998; Hoy & Tarter, 1997). These three subscales measured each of the three components of academic optimism: collective efficacy, faculty trust in students and parents; they worked together to define academic optimism as a single latent variable.

The whole SAOS consists of 30 items scored on a Likert-type scale. Originally, there were twenty-two of the items scored on a range of 1 (strongly disagree) to 6 (strongly agree), and eight of the items were scored on a range of 1 (rarely) to 4 (very often). However, because research indicates that data characteristics don’t change significantly according to the number of scale points used (Dawes, 2008), in this research, all 30 items were scored on a 6-point scale for the sake of consistency and aesthetics.

Although it was assumed that the items for each school variable were appropriate to use with teachers in Taiwan, a check of factor structure and reliability was performed for the scales used in this study and items that did not fit well were eliminated. In order to make for a parsimonious solution, only items with high factor loadings were retained: in fact, items with factor loadings under .60 were eliminated in each iteration until all remaining items had loading over .60. The results of principal axis factor analyses, along with reliability statistics for each of the school variables under study were presented in the following paragraphs.

Collective Efficacy Scale Short Form - Collective Efficacy

Collective efficacy is defined as “the judgment of teachers that the faculty as a whole can organize and execute the actions required to have positive effects on students”
Collective Efficacy Scale Short Form (Goddard, 2002) is the shortened version of Collective Efficacy Scale (CE-SCALE; Goddard, Hoy, & Woolfolk Hoy, 2000). The original CE-SCALE consisted of 21 items, while the short form only consisted of 12 items. Though the short form is much shortened then original scale, the correlation between the two scales \( r = .983 \) suggests that the 12-item scale is quite strongly related to the original scale (Goddard, 2002). Previous research has also demonstrated the construct validity and reliability \( (\alpha = .91) \) of this shortened scale (Goddard, 2002).

Sample items included, “Teachers in this school are able to get through to the most difficult students,” “Drug and alcohol abuse in the community make learning difficult for students here (score reversed),” “These students come to school ready to learn,” and “Students here just aren’t motivated to learn (score reversed).”

A principal axis factor analysis of the 12 items of collective efficacy scale was conducted with Taiwan sample. Because Goddard and his colleagues (2000) described the scale as unidimensional, the factor analysis was set to extract a single factor. The single factor explained 39.73 percent of item variance (eigenvalue = 4.77), and reliability on the original 12 items was high \( (\alpha = .85) \). Not all the items, however, loaded strongly on the factor; 6 items had loadings under .60. Therefore, item 7, 5, 4, 12, 9, 11 were eliminated in the second iteration.

The result of the second iteration with the remaining 6 items yielded a slightly better solution, explaining 55.56 percent of variance and yielding an alpha coefficient
of .82. However, item 3 did not have factoring loading lower than .60; hence it was eliminated in the next iteration. In the final iteration, all remaining items had loadings higher than .60, therefore, all of them were included. As expected, the percent of variance explained by the factor was higher (60.10%), and the alpha coefficient remained high ($\alpha = .82$). Thus, the measure of collective efficacy that was used in subsequent analysis of data in this study was this 5-item scale. The results of factor analysis were summarized in Table 3.1.
Table 3.1: Factor Analysis of Collective Efficacy Scale

<table>
<thead>
<tr>
<th>Items</th>
<th>Collective Efficacy Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First Iteration</td>
</tr>
<tr>
<td>N01ColEff1r_mean</td>
<td>.800</td>
</tr>
<tr>
<td>N02ColEff2_mean</td>
<td>.782</td>
</tr>
<tr>
<td>N08ColEff8_mean</td>
<td>.648</td>
</tr>
<tr>
<td>N06ColEff6_mean</td>
<td>.641</td>
</tr>
<tr>
<td>N10ColEff10_mean</td>
<td>.636</td>
</tr>
<tr>
<td>N03ColEff3r_mean</td>
<td>.608</td>
</tr>
<tr>
<td>N07ColEff7_mean</td>
<td>.529</td>
</tr>
<tr>
<td>N05ColEff5_mean</td>
<td>.529</td>
</tr>
<tr>
<td>N04ColEff4r_mean</td>
<td>.489</td>
</tr>
<tr>
<td>N12ColEff12r_mean</td>
<td>.489</td>
</tr>
<tr>
<td>N09ColEff9r_mean</td>
<td>.479</td>
</tr>
<tr>
<td>N11ColEff11r_mean</td>
<td>.241</td>
</tr>
</tbody>
</table>

Variance Explained | 39.73 | 55.56 | 60.10 |
Reliability        | .85   | .82   | .82   |

Table 3.1: Factor Analysis of Collective Efficacy Scale

The final five items used to measure collective efficacy in this study were as follows:

1. Students here just aren’t motivated to learn.
2. Teachers here are confident they will be able to motivate their students.
8. Teachers in this school are able to get through to the most difficult students.
6. These students come to school ready to learn.
10. The opportunities in this community help ensure that these students will learn.
Faculty Trust in Clients subscale in Omnibus Trust Scale – Faculty Trust in Clients

Faculty trust in clients is faculty’s willingness to be vulnerable to students and parents based on the confidence that the students and parents are benevolent, reliable, competent, honest, and open (Goddard, Tschannen-Moren, & Hoy, 2001; Hoy & Tschannen-Moran, 2003). It was measured using the faculty trust in clients subscale in Omnibus Trust Scale developed by Hoy and Tschannen-Moran (2003).

This subscale from Omnibus Trust Scale consisted of 10 items measured along a 6-point continuum ranging from 1 (strongly disagree) to 6 (strongly agree). These scores represented a low to high score of a teacher’s sense of trust in students and parents. Sample items of the scale included, “Teachers in this school can trust their students,” “Parents in this school are reliable in their commitment,” “Students in this school can be counted on to do their work,” and “Teachers in this school believe students are competent learners.” The reliability ($\alpha = .94$) and construct validity of the scale have been supported in previous studies (Hoy & Tschannen-Moran, 2003; Hoy at al., 2006; Smith & Hoy, 2007).

Though it may seem that collective trust in students and collective trust in parents are two different concepts, previous research (Bryk and Schneider, 2002; Forsyth, Adams, & Hoy, 2011; Goddard, Tschannen-Moran, & Hoy, 2001; Hoy & Tschannen-Moran, 2003) demonstrated that they worked as one. Bryk and Schneider (2002) suggested that faculty trust in students is enacted through faculty trust in the parents; therefore, it should not be surprising that the two referents of collective trust covary and formed a single factor. When the faculty trusts parents, it also trusts students. Similar to the existing
studies of trust, in this study, we also assumed that only one strong dimension would emerge in the factor analysis, that is, faculty trust in parent and students would yield a single factor.

The result of the factor analysis of the faculty trust in parents and students produced a single factor, which explained 62.44 percent of item variance (eigenvalue = 6.24). Reliability on the 10 items was high, with an alpha coefficient of .93. There are two items, item 15 and 22, had factor loadings lower than our criteria (.60), therefore, these two items were eliminated in the second and final iteration.

The final iteration on trust items yielded even a better result. The factor solution showed that there was one strong factor, which explained 73.41 percent of item variance (eigenvalue = 5.87). All of the remaining items had loadings higher than .60; hence, all of them were included in the refined measure of trust. The reliability check also showed the scale had high reliability with an alpha coefficient of .94. Thus, this 8-item measure of faculty trust in students and parents was used in the further analysis of the data of this study. The results of factor analyses of faculty trust in students and parents were summarized in the Table 3.2.
<table>
<thead>
<tr>
<th>Items</th>
<th>Collective Trust Factor</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First Iteration</td>
<td>Second Iteration</td>
<td></td>
</tr>
<tr>
<td>N16Trust4_mean</td>
<td>.903</td>
<td>.913</td>
<td></td>
</tr>
<tr>
<td>N14Trust2_mean</td>
<td>.901</td>
<td>.904</td>
<td></td>
</tr>
<tr>
<td>N21Trust9_mean</td>
<td>.881</td>
<td>.882</td>
<td></td>
</tr>
<tr>
<td>N17Trust5_mean</td>
<td>.848</td>
<td>.859</td>
<td></td>
</tr>
<tr>
<td>N20Trust8_mean</td>
<td>.841</td>
<td>.851</td>
<td></td>
</tr>
<tr>
<td>N13Trust1_mean</td>
<td>.818</td>
<td>.795</td>
<td></td>
</tr>
<tr>
<td>N18Trust6_mean</td>
<td>.764</td>
<td>.762</td>
<td></td>
</tr>
<tr>
<td>N19Trust7_mean</td>
<td>.702</td>
<td>.698</td>
<td></td>
</tr>
<tr>
<td>N15Trust3_mean</td>
<td>.530</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N22Trust10r_mean</td>
<td>.261</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variance Explained</td>
<td>62.44</td>
<td>73.41</td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td>.93</td>
<td>.94</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.2: Factor Analysis of Collective Trust Scale

The final eight items used to measure collective efficacy in this study were as follows:

16. Parents in this school are reliable in their commitments.
14. Teachers in this school trust the parents.
21. Teachers can believe what parents tell them.
17. Students in this school can be counted upon to do their work.
20. Teachers think that most of the parents do a good job.
13. Teachers in this school trust their students.
18. Teachers can count upon parental support.

19. Teachers here believe that students are competent learners.

**Academic emphasis subscale in Organizational Health Inventory – Academic Emphasis**

Academic emphasis is “the extent to which a school is driven by academic excellence” (Goddard, Sweetland, & Hoy, 2000, p.686). It was measured using 8 items that are a part of the Organizational Health Inventory (Hoy et al., 1991; Hoy & Sabo, 1998; Hoy & Tarter, 1997). Previous research also has demonstrated construct validity and reliability ($\alpha = .83$) of the subscale (Hoy et al., 2006; Hoy & Sabo, 1998; Hoy & Tarter, 1997). Sample items in the scale include, “Students respect others who get good grades,” “Students in this school can achieve the goals that have been set for them,” “The school sets high standards for academic performance,” and “Academic achievement is recognized and acknowledged by the school.”

The result of principal axis factor analysis of academic emphasis indicated a one-factor solution, with an eigenvalue of 5.02 and 62.77 percent of variance explained. Internal reliability was also high, with an alpha of .91. The factor loadings of item 26 and item 23 were both below .60, therefore, in the next iteration, only the first 6 items were included.

The second iteration on academic emphasis items produced a better solution. The single factor explained 74.72 percent of item variance (eigenvalue = 4.48). All of the remaining 6 items had loadings higher than .60; therefore all of them were included. The reliability check also showed the remaining items had high reliability with an alpha coefficient of .92. Thus, the measure of academic emphasis that was used in the further
analysis of this study was this 6-item scale. The results of factor analyses of academic emphasis were summarized in the Table 3.3.

<table>
<thead>
<tr>
<th>Items</th>
<th>Academic Emphasis Factor</th>
<th>First Iteration</th>
<th>Second Iteration</th>
</tr>
</thead>
<tbody>
<tr>
<td>N29AcdPre7_mean</td>
<td>.912</td>
<td>.923</td>
<td></td>
</tr>
<tr>
<td>N24AcdPre2_mean</td>
<td>.894</td>
<td>.897</td>
<td></td>
</tr>
<tr>
<td>N25AcdPre3_mean</td>
<td>.870</td>
<td>.882</td>
<td></td>
</tr>
<tr>
<td>N27AcdPre5_mean</td>
<td>.840</td>
<td>.836</td>
<td></td>
</tr>
<tr>
<td>N30AcdPre8_mean</td>
<td>.826</td>
<td>.827</td>
<td></td>
</tr>
<tr>
<td>N28AcdPre6_mean</td>
<td>.643</td>
<td>.628</td>
<td></td>
</tr>
<tr>
<td>N26AcdPre4_mean</td>
<td>.516</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N23AcdPre1_mean</td>
<td>.484</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variance Explained</td>
<td>62.77</td>
<td>74.72</td>
<td></td>
</tr>
<tr>
<td>Reliability</td>
<td>.91</td>
<td>.92</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.3: Factor Analysis of Academic Emphasis Scale

The final six items used to measure collective efficacy in this study were as follows:

29. The students in this school can achieve the goals that have been set for them.
24. Students respect others who get good grades.
25. Students seek extra work so they can get good grades.
27. Students try hard to improve on previous work.
30. Teachers in this school believe that their students have the ability to achieve academically.

28. The learning environment is orderly and serious.

**Collective Responsibility Scale (CR)**

Collective responsibility has been defined as “teachers’ willingness to accept responsibility for their students’ outcomes” (LoGerfo and Goddard, 2008, p.77). It was measured using six Likert items scored on a 6-point scale ranging from 1 (strongly disagree) to 6 (strongly agree) (LoGerfo and Goddard, 2008). Each of the items was aggregated by mean to the school level. Previous study demonstrated that the factor loadings for each item ranges from .690 to .849, and the measure has concurrent validity and high internal reliability ($\alpha = .85$) (LoGerfo and Goddard, 2008).

Sample items included, “Teachers in my school take responsibility for improving the school,” “Teachers in my school are willing to take responsibility for all students’ learning,” and “Teachers in my school hold themselves responsible to ensure that all students succeed.”

LoGerfo and Goddard (2008) demonstrated that collective responsibility had only one dimension, therefore, in this study, we also assumed that only one factor would emerge for collective responsibility. Principal axis factor analysis resulted in one factor with an eigenvalue of 4.68, which explained 78.02 percent of the item variance. The reliability test indicated that the scale had high internal reliability ($\alpha = .94$). One item had a loading .593, which was barely below the .60 criterion that was used, but in keeping with the criterion used for all the scales, it was eliminated. With the item removed, the
The 5-item scale had a high reliability of .92 and all of the items loaded strongly on the factor (all above .8). The results of factor analyses of collective responsibility were summarized in the Table 3.4.

<table>
<thead>
<tr>
<th>Items</th>
<th>Collective Responsibility Factor</th>
<th>First Iteration</th>
<th>Second Iteration</th>
</tr>
</thead>
<tbody>
<tr>
<td>N32ColRes2_mean</td>
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<td></td>
<td>.955</td>
</tr>
<tr>
<td>N35ColRes5_mean</td>
<td>.925</td>
<td></td>
<td>.924</td>
</tr>
<tr>
<td>N33ColRes3_mean</td>
<td>.923</td>
<td></td>
<td>.917</td>
</tr>
<tr>
<td>N31ColRes1_mean</td>
<td>.918</td>
<td></td>
<td>.922</td>
</tr>
<tr>
<td>N34ColRes4_mean</td>
<td>.824</td>
<td></td>
<td>.813</td>
</tr>
<tr>
<td>N36ColRes6_mean</td>
<td>.593</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Variance Explained 78.02 85.74
Reliability .94 .92

Table 3.4: Factor Analysis of Collective Responsibility Scale

The final five items used to measure collective efficacy in this study were as follows:

32. Teachers in my school set high standards for their teaching.

35. Teachers in my school hold themselves responsible to ensure that all students succeed.

33. Teachers in my school are willing to take responsibility for all students’ learning.

31. Teachers in my school take responsibility for improving the school.
34. Teachers in my school are responsible to help each other do their best.

**Statistical Method and Analysis Process**

This study was a quantitative study that examined the relationships among school academic optimism, collective responsibility, and academic achievement while controlling for school SES. Therefore, the school was the unit of analysis in this research. Scoring was done in two-stage process that first calculated school means for each item, for each variable. Then, the means for each item were then averaged to calculate the overall school mean for each variable. Prior to scoring, negatively worded items were reverse coded.

Data analysis included several phases. First, the Statistical Product and Service Solutions (SPSS 19.0) was used to calculate reliability statistics, mean scores, standard deviations, and ranges for collective responsibility, academic optimism, as well as each of the subscales. Secondly, structural equation modeling and LISREL 8.8 was used to test the following hypotheses:

**H.1.** Academic optimism is a single, latent trait of schools that is manifested through collective efficacy, academic emphasis and trust in Taiwan elementary schools.

**H.2.** Academic optimism has a direct and positive relationship with student achievement, even after controlling for SES.

**H.3.** Collective responsibility has a direct and positive relationship with student achievement, even after controlling for SES.
H.4. Collective responsibility has a direct and positive relationship with academic optimism.

The entire theoretical framework for the study, which includes all the hypotheses, can be summarized in a path model presented in Figure 3.1.

Figure 3.1: The Theoretical Model of Academic Optimism, Collective Responsibility and School Achievement
By using structural equation modeling (SEM), we could estimate direct and indirect effects simultaneously, and each path coefficient was estimated after the control variable has been considered. Further, the fitness of our theoretical model can also be tested. Many goodness of fit statistics will be used to determine the acceptance or rejection of our theoretical model.

In this study, a Chi-square test will be conducted first. However, each of Then norm-fit index (NFI), the comparative-fit index (CFI), and the mean root square error of approximation (RESEA) will be conducted to complement the chi-square test.

**Ethical Safeguards**

Approval for this study was obtained from the Institutional Review Board (IRB) at The Ohio State University. The committee determined that the study was in compliance with appropriate ethical standards and was exempted from formal review. Participation in this study was optional and participants could drop at any time without penalty. Individual responses were anonymous and schools were not individually identifiable.

**Summary**

This study was a quantitative study that examined the relationships among academic optimism, collective responsibility, and student achievement in Taiwan elementary schools, while socioeconomic status has been controlled. The Chinese version of School Academic Optimism Survey (SAOS) and Collective Responsibility Scale (CR) had been used to measure the two school variables, the percentage of students who received free lunch for each school had been used to measure school SES, and the school
average scores of The Basic Competence Test for Hualien Elementary School Students of 5th and 6th graders in both Chinese and Mathematics had been used to measure academic achievement. Descriptive and reliability statistics will be conducted first, and then structural equation modeling will be used to test our theoretical path model for the hypotheses.
CHAPTER 4
RESULTS

This chapter presents the results of the data analysis from 103 public elementary schools in Hualien, Taiwan. The chapter begins with a summary of the descriptive statistics for each major variable in this research including the minimum, maximum, mean, standard deviation, and alpha coefficient. Next, the results of the correlation analyses between major variables were examined. Finally the hypotheses were tested using confirmatory factor analysis (CFA) and structural equation modeling analysis (SEM).

Description Statistics of the Variables

Collective efficacy, collective trust, academic emphasis, collective responsibility, and academic optimism were measured by questionnaires using Likert-type items. Mean scores for each item were calculated after reverse scoring the negative descriptive items. Therefore, with one exception, the higher the score, the higher the level of the construct. The percentage of students eligible for free lunch was used to indicate school SES. Thus, the higher the percentage of students eligible for free lunch, the lower the SES of the school. All of the school variables mentioned above had reasonable ranges, standard deviations, and alpha coefficients. Average 5th & 6th graders’ Chinese and Math scores were used to indicate the level of student achievement at the school level. These three
school variables also had reasonable means, ranges, and standard deviations (see Table 4.1).

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collective Efficacy</td>
<td>103</td>
<td>2.38</td>
<td>4.58</td>
<td>3.57</td>
<td>.43</td>
<td>.82</td>
</tr>
<tr>
<td>Collective Trust</td>
<td>103</td>
<td>2.99</td>
<td>5.00</td>
<td>4.12</td>
<td>.45</td>
<td>.94</td>
</tr>
<tr>
<td>Academic Emphasis</td>
<td>103</td>
<td>2.52</td>
<td>4.75</td>
<td>3.96</td>
<td>.44</td>
<td>.92</td>
</tr>
<tr>
<td>Collective Responsibility</td>
<td>103</td>
<td>4.20</td>
<td>5.66</td>
<td>5.09</td>
<td>.32</td>
<td>.96</td>
</tr>
<tr>
<td>% of students eligible for free lunch</td>
<td>103</td>
<td>3.30</td>
<td>100.00</td>
<td>40.97</td>
<td>23.08</td>
<td>-</td>
</tr>
<tr>
<td>Average 5th &amp; 6th Graders’ Chinese Score</td>
<td>103</td>
<td>51.09</td>
<td>75.65</td>
<td>66.39</td>
<td>5.40</td>
<td>-</td>
</tr>
<tr>
<td>Average 5th &amp; 6th Graders’ Math Score</td>
<td>103</td>
<td>34.62</td>
<td>76.41</td>
<td>55.85</td>
<td>7.89</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 4.1: Descriptive Statistics of the Major Variables.

**Correlation Analysis of Major Variables**

Table 4.2 provides a correlation matrix of the major variables of the study. As predicted, the three components of academic optimism (collective efficacy, collective trust, and academic emphasis) were all highly correlated with each other. Also, as predicted, collective responsibility and the percentage of students eligible for free lunch, our indication for socioeconomic status, were all moderately related with the three
components of academic optimism. Consistent with previous studies (LoGerfo & Goddard, 2008), there was no significant relationship between collective responsibility and socioeconomic status.

The correlation matrix further revealed that collective efficacy, collective trust, academic emphasis, and collective responsibility were all significantly related to our indications of student achievement, average 5th & 6th graders’ Chinese and math scores. However, different from the previous research, the percentage of students eligible for free lunch had no significant relationship with average 5th & 6th graders’ math score, and only a small (but significant) relationship with average 5th & 6th graders’ Chinese test score. In brief, besides the moderate relationship between SES and school student achievement, the results of correlations analysis were consistent with expectations and previous research.
Table 4.2: Correlations among the Major Variables

<table>
<thead>
<tr>
<th>Observed Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Collective Efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Collective Trust</td>
<td>.792**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Academic Emphasis</td>
<td>.831**</td>
<td>.807**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Collective Responsibility</td>
<td>.341**</td>
<td>.375**</td>
<td>.324**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. % of students eligible for</td>
<td>-.241*</td>
<td>-.215*</td>
<td>-.228*</td>
<td>.093</td>
<td></td>
<td></td>
</tr>
<tr>
<td>free lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Average 5th &amp; 6th Graders'</td>
<td>.553**</td>
<td>.427**</td>
<td>.535**</td>
<td>.279**</td>
<td>-.199*</td>
<td></td>
</tr>
<tr>
<td>Chinese Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Average 5th &amp; 6th Graders'</td>
<td>.491**</td>
<td>.419**</td>
<td>.504**</td>
<td>.312**</td>
<td>-.177</td>
<td>.858**</td>
</tr>
<tr>
<td>Math Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Confirmatory Factor Analysis of the Latent Exogenous Variables

The two latent variables that are pivotal in our model predicting student achievement are academic optimism and collective responsibility. Before proceeding to test the full SEM model, the factor structure of these latent variables was confirmed using confirmatory factor analysis (CFA). In the current CFA model, academic optimism has three indicators (collective efficacy, collective trust, and academic emphasis) whereas collective responsibility has five indicators (five items from collective responsibility scale). First, the indicators measuring academic optimism were correlated with each other as were the indicators measuring collective responsibility. The high correlations among
the indicators for academic optimism and collective responsibility suggest that a general factor could be formed for each variable.

<table>
<thead>
<tr>
<th>Collective Responsibility Items</th>
<th>31</th>
<th>32</th>
<th>33</th>
<th>34</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item 31</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers in my school take responsibility for improving the school.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Item 32</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers in my school set high standards for their teaching.</td>
<td>.930**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Item 33</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers in my school are willing to take responsibility for all students’ learning.</td>
<td>.819**</td>
<td>.882**</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td><strong>Item 34</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers in my school are responsible to help each other do their best.</td>
<td>.742**</td>
<td>.747**</td>
<td>.747**</td>
<td>--</td>
</tr>
<tr>
<td><strong>Item 35</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers in my school hold themselves responsible to ensure that all students succeed.</td>
<td>.832**</td>
<td>.854**</td>
<td>.867**</td>
<td>.787**</td>
</tr>
</tbody>
</table>

Table 4.3: Correlations among Collective Responsibility Items
** Correlation is significant at the 0.01 level (2-tailed).

The model for the confirmatory factor analysis of these two variables is shown in Figure 4.1. LISREL 8.8 was used to perform the confirmatory analysis of the two latent variables.
Figure 4.1: Theoretical Model for the Confirmatory Factor Analysis of the Exogenous Variables

Test I: Initial Factor Analysis

The result of our initial confirmatory factor analysis indicated that the data didn’t support the model well. The goodness of fit indices reported a $\chi^2$ (Chi-Square) of 48.08 ($p$
= 0.00) with $df = 19$. The significant $\chi^2$ indicated a poor fit of the model. However, because $\chi^2$ has been found to be too sensitive to sample size, and tends to be greater when the number of observed variables increases, it cannot be used as a sole indicator for model fit. The next two goodness of fit statistics were the Goodness-of-Fit Index (GFI) and the Adjusted Goodness of Fit Index (AGFI) respectively. GFI assesses the relative amount of the observed variance and covariance explained by the model (which is similar to $R^2$ in regression analysis), and AGFI is GFI adjusted by a ratio of the degrees of freedom used in the model to the total degrees of freedom. Both measures are scaled from 0 to 1 with an ideal value above .95 or at least greater than .90. The GFI was .89 and AGFI was .80 for the model and failed to meet the .90 threshold of acceptable fit. The fourth goodness of fit statistic is the standardized root mean square residual (SRMR) is an indication of the extent of error generated from the estimation of the specified model. Therefore, low SRMR score (less than .05) represents a good model fit. The SRMR from our first test is .037, indicated a good fit. The fifth goodness of fit statistics we used was the Root Mean Square Error of Approximation (RMSEA). RMSEA standardizes the measure of $\chi^2$ and thus corrects the tendency of the $\chi^2$ to reject models with a large sample size. Ideally, an acceptable fit is indicated by a value under .08, and an excellent fit is indicated by a value under .05. The value of the RMSEA for our initial model was .12, which was higher then .08 and therefore indicated a poor fit. The sixth goodness of fit statistic is the Comparative Fit Index (CFI), which indicates the relative lack of fit of a specified model versus the baseline model. CFI is scaled from 0 to 1, with higher values represents better fit. A value over .95 indicated a good model. The CFI from our initial
model was .97, which indicated that our initial model had a good fit and was much better than the baseline model. Our last goodness of fit statistic is the non-normed fit index (NNFI), also called the Tucker Lewis Index (TLI). It is used to compare a proposed model to the null model. Typically, a value that approaches 1.0 indicated a good fit. The value of NNFI for our initial model was .96, indicated a good fit. In brief, the reported standards above are the ones that will be used to evaluate fit in this research (Schumacker & Lomax, 2010).

In sum, among the seven goodness of fit indices from the initial test, three measures indicated that the model has a good fit, and the other four indices all indicated a poor fit for the data. The results showed that the initial model was not supported well by the fit statistics; therefore, the modification indices that could theoretically be supported were used to improve the model fit.

*Test II: Refined Factor Analysis*

The modification indices from the first test suggested adding two error covariances among three collective responsibility items: between item 31 (Teachers in my school take responsibility for improving the school) and item 32 (Teachers in my school set high standards for their teaching), as well as between item 31 (Teachers in my school take responsibility for improving the school) and item 33 (Teachers in my school are willing to take responsibility for all students’ learning). Usually, correlated within-factor measurement errors imply a number of things. They could imply the presence of another factor; they could imply a direct causal relationships among the indicators; or they could imply that the adjacent items, which that have strong factor loadings on the
same latent factor, likely have strong correlations among the error terms (Aish & Jöreskog, 1990; Byrne, 2001). In this case, the third explanation fits our circumstance. All three items were adjacent to each other in the questionnaire and all three had extremely high loadings on collective responsibility (.91, .93, .94); therefore, it was reasonable to follow the modification indices and correlate the error terms between item 31 and 32, and between item 31 and 33. The items were similar theoretically and were adjacent to each other; thus, it is likely the error terms would be correlated.

Based on the modifications, the model was retested with the suggested errors correlated. Using the same sample data, the second test yielded a much better result. The goodness of fit indices reported for Test II included a $\chi^2$ of 19.29, $df = 17$, $p = .31$. The non-significant p value indicated a good model fit. The Goodness of Fit Index (GFI) was .95, which suggest a good model fit, and Adjusted Goodness of Fit Index (AGFI) was .90, which suggested a marginal fit. The standardized root mean square residual (SRMR) was .035, which is lower than .05, indicated a good fit. The root mean square error of approximation (RMSEA) was .036, which is within the .05 standard for an excellent fit. The Comparative Fit Index (CFI) was 1.00, indicated a great model fit. The non-normed fit index (NNFI) or Tucker Lewis Index (TLI), was also 1.00, suggested a great model fit (> .95).

According to the model-fit statistics, Test II produced a much better result than our initial test. Six criteria yielded great fit for the data ($\chi^2$, GFI, SRMR, RMSEA, CFI, NNFI) and one measure (AGFI) resulted in a marginal fit. The comparisons of model fit indices between the two tests were demonstrated in Table 4.4. In addition, Figure 4.2 also
showed that each observed variable has high and significant factor loading on the correspondent latent variable. In sum, high and significant factor loadings and overall good model-fit statistics indicated that the hypothesized factor structure for both collective responsibility and academic optimism were supported by the confirmatory factor analysis. Because the factor structure of the latent variables was confirmed, we can now efficiently test the hypotheses of this study using structural equation modeling (SEM).
Figure 4.2: Results of Confirmatory Factor Analysis of the Latent Exogenous Variables (Test II)
<table>
<thead>
<tr>
<th>Model fit Statistics</th>
<th>Criteria</th>
<th>Test I</th>
<th>Test II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square ($\chi^2$) test</td>
<td>Non-significance</td>
<td>48.08</td>
<td>19.29</td>
</tr>
<tr>
<td></td>
<td>($p = 0.00$)</td>
<td></td>
<td>($p = .31$)**</td>
</tr>
<tr>
<td>Goodness-of-Fit index (GFI)</td>
<td>&gt;.95 or at least &gt;.90</td>
<td>.89</td>
<td>.95**</td>
</tr>
<tr>
<td>Adjusted Goodness of Fit Index (AGFI)</td>
<td>&gt;.95 or at least &gt;.90</td>
<td>.80</td>
<td>.90*</td>
</tr>
<tr>
<td>The Standardized Root Mean Square Residual (SRMR)</td>
<td>&lt;.05</td>
<td>.037**</td>
<td>.035**</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation (RMSEA).</td>
<td>&lt;.05 great fit</td>
<td>.12</td>
<td>.036**</td>
</tr>
<tr>
<td></td>
<td>&lt;.08 marginal fit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparative Fit Index (CFI)</td>
<td>&gt;.95, closer to 1 is better</td>
<td>.97*</td>
<td>1.00**</td>
</tr>
<tr>
<td>Non-Normed Fit Index (NNFI), or Tucker Lewis Index (TLI)</td>
<td>&gt;.95, close to 1 is better</td>
<td>.96*</td>
<td>1.00**</td>
</tr>
</tbody>
</table>

Table 4.4: A Comparison of Fit Statistics for the Two Tests of the Confirmatory Factor Analysis

** Excellent fit
* Marginal fit

**Results of Structural Equation Modeling Analysis on Hypotheses**

The four hypotheses guiding this study were as follows:

H.1. Academic optimism is a single, latent trait of schools that is manifested through collective efficacy, academic emphasis and trust in Taiwan elementary schools.

H.2. Academic optimism has a direct and positive relationship with student achievement, even after controlling for SES.
H.3. Collective responsibility has a direct and positive relationship with student achievement, even after controlling for SES.

H.4. Collective responsibility has a direct and positive relationship with academic optimism.

In order to test the above four hypotheses, a structural equation modeling analysis was performed using the responses collected from 103 Hualien elementary schools. The hypotheses were depicted in a SEM path model described graphically in Figure 4.3. The measurement component is indicated by thin lines and the structural component by bolded lines, for ease of distinguishing the components.

The result of model fit indices reported for our SEM model included a $\chi^2$ of 46.06, $df = 37$, $p = .15$. The non-significant $p$ value indicated a good model fit. The Goodness of Fit Index (GFI) was .92, which suggest a good model fit. However, Adjusted Goodness of Fit Index (AGFI) was .86, which was still below the .90 thresholds for acceptable fit. The standardized root mean square residual (SRMR) was .033, which is lower than .05, indicated a good fit. The root mean square error of approximation (RMSEA) was .049, which is within the .05 standard for an excellent fit. The Comparative Fit Index (CFI) was .99, which is really close to 1, indicated a great model fit. The non-normed fit index (NNFI) or Tucker Lewis Index (TLI), was .99, suggested a good model fit (> .95). The model-fit statistics are summarized in Table 4.5. In brief, the goodness of fit report of the SEM suggested that our model has a strong fit to the data. Six criteria yielded outstanding fit for the data ($\chi^2$, GFI, SRMR, RMSEA, CFI, NNFI) and only one measure (AGFI)
missed acceptable levels (see Table 4.5). Therefore, the results suggested that our hypothesized model fit the data well.

<table>
<thead>
<tr>
<th>Model fit Statistics</th>
<th>Criteria</th>
<th>Fitness indices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square ($\chi^2$) test</td>
<td>Non-significance</td>
<td>46.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>($p = .15$)**</td>
</tr>
<tr>
<td>Goodness-of-Fit index (GFI)</td>
<td>&gt;.95 or at least &gt;.90</td>
<td>.92*</td>
</tr>
<tr>
<td>Adjusted Goodness of Fit Index (AGFI)</td>
<td>&gt;.95 or at least &gt;.90</td>
<td>.86</td>
</tr>
<tr>
<td>The Standardized Root Mean Square Residual</td>
<td>&lt;.05</td>
<td>.033**</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation (RMSEA)</td>
<td>&lt;.05 great fit</td>
<td>.049**</td>
</tr>
<tr>
<td>Comparative Fit Index (CFI)</td>
<td>&gt;.95, closer to 1 is better</td>
<td>.99**</td>
</tr>
<tr>
<td>Non-Normed Fit Index (NNFI), or Tucker Lewis Index (TLI)</td>
<td>&gt;.95, close to 1 is better</td>
<td>.99**</td>
</tr>
</tbody>
</table>

Table 4.5: Fit Statistics for the Structural Equation Model

** Excellent fit
* Marginal fit

The standardized solution is depicted in Figure 4.3. As expected, academic optimism was related positively to student achievement (standardized coefficient = 0.53, $p < .05$). However, neither SES (measured by the percentage of students eligible for free lunch) nor collective responsibility was directly related to student achievement.
Nevertheless, both SES and collective responsibility were significantly related to academic optimism (standardized coefficient = -0.29, \( p < .05 \); standardized coefficient = 0.44, \( p < .05 \)). Together, SES and collective responsibility accounted for 25% of the variance in academic optimism, and overall, the model accounted for 37% of the variance in student achievement.

Figure 4.3: The Theoretical Model of Academic Optimism, Collective Responsibility, SES, and Student Achievement. All Path Coefficients Were Standardized

* Significant at \( p < .05 \) (2-tailed)
To test the statistical significance of indirect effects, the procedure described by Schreiber and his colleagues (Schreiber et al., 2006) was used; LISREL 8.8 was used to compute the statistical tests for indirect effects. The statistical tests of direct and indirect effects of structural equation model are reported in Table 4.6. Although SES and collective responsibility didn’t have direct effects on student achievement as hypothesized, the results showed that both school variables had significant indirect effects on student achievement mediated through academic optimism (standardized coefficient = -0.15, \( p < .05 \); standardized coefficient = 0.23, \( p < .05 \)).
Table 4.6: Statistical Tests for Direct and Indirect Effects of Structural Equation Model

<table>
<thead>
<tr>
<th>Model</th>
<th>SES</th>
<th>Collective Responsibility</th>
<th>Academic Optimism</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Optimism</td>
<td>-0.29*</td>
<td>0.44*</td>
<td></td>
<td>0.25</td>
</tr>
<tr>
<td>(t = -3.12)</td>
<td>(t = 4.44)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Achievement</td>
<td>-0.08</td>
<td>0.11</td>
<td>0.53*</td>
<td>0.37</td>
</tr>
<tr>
<td>(t = -0.90)</td>
<td>(t = 1.15)</td>
<td>(t = 4.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indirect</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Optimism</td>
<td>-0.15*</td>
<td>0.23*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(t = -2.67)</td>
<td>(t = 3.37)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Optimism</td>
<td>-0.29*</td>
<td>0.44*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(t = -3.12)</td>
<td>(t = 4.44)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Achievement</td>
<td>-0.24*</td>
<td>0.34*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(t = -2.43)</td>
<td>(t = 3.43)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Coefficient is significant at the 0.05 level (2-tailed)

Summary

Four hypotheses guided the empirical phase of this study and specified the relationships among socioeconomic status, academic optimism, collective responsibility, and student achievement. The results for testing each hypothesis are summarized next.
**H.1. Academic optimism is a latent trait of schools that is manifested through collective efficacy, academic emphasis and collective trust in Taiwan elementary schools.**

The confirmatory factor analysis depicted in Figure 4.2, collective efficacy (.91), faculty trust in students and parents (.87), and academic emphasis (.92) all had high factor loadings on academic optimism. The substantial factor loadings along with the overall model fit indices provided a strong support for both the measurement model and the structural model. In brief, the evidence supported the hypothesis that academic optimism was a latent variable, which consisted of academic emphasis, collective efficacy, and faculty trust in students and parents.

**H.2. Academic optimism has a direct and positive relationship with student achievement, even after controlling for SES.**

Figure 4.3 and Table 4.6 demonstrated that the path coefficient between academic optimism and student achievement was .53 ($p < .05$). The large and significant path coefficient indicated that academic optimism has a strong and significant influence over student achievement, even after controlling for SES. Therefore, our second hypothesis was also supported by the results from the SEM analysis.

**H.3. Collective responsibility has a direct and positive relationship with student achievement, even after controlling for SES.**

Judging from Figure 4.3, the path coefficient between collective responsibility and student achievement in our SEM analysis was 0.11 ($p > .05$). The small and insignificant path coefficient indicated that there are no direct relationship between collective responsibility and student achievement. Therefore, hypothesis 2 was not
supported by our analysis. However, the result from effects analysis (Table 4.6) suggested that collective responsibility was indirectly and positively related to student achievement through academic optimism (path coefficient = .23, \( p < .05 \)).

**H.4. Collective responsibility has a direct and positive relationship with academic optimism.**

Figure 4.3 indicated that the path coefficient between collective responsibility and academic optimism was .44 (\( p < .05 \)). The strong and significant path coefficient between collective responsibility and academic optimism supported a direct and positive relationship between the two variables. Therefore, the fourth hypothesis was supported by the findings.

In brief, the factor structures for both academic optimism and collective responsibility were supported by the confirmatory factor analysis using SEM. Furthermore, the guiding model was supported with one exception. Collective responsibility was not directly related to student achievement; however, collective responsibility was indirectly related to student achievement through academic optimism.
CHAPTER 5

DISCUSSION OF RESULTS

The findings of the study are discussed in this chapter. First, a brief summary of the major findings is presented, and then tentative conclusions are drawn using the current research and theory. Next, some practical implications of the findings are discussed. Finally, an agenda for future research is developed and a conclusion is presented.

Major Finding

The findings of the study are summarized as follows:

1. The model of academic optimism proposed by Hoy and his colleagues (2006a; 2006b) was supported in Taiwan through confirmatory factory analysis. The results indicated that academic optimism was a latent school construct comprised of collective teacher efficacy, faculty trust in students and parents, and academic emphasis.

2. As predicted, the structural equation modeling analysis demonstrated that academic optimism was positively related with student achievement even when controlling for school socioeconomic status in Taiwan.
3. Collective responsibility was directly related to academic optimism. The higher the collective responsibility, the higher the academic optimism, even when controlling for socioeconomic status.

4. Contrary to the hypothesis, collective responsibility had no direct relationship with student achievement in the structural equation model; however, collective responsibility had a significant indirect relationship with student achievement through academic optimism.

5. As predicted, the results showed that there was no relationship between collective responsibility and socioeconomic status.

6. As predicted, the results showed that socioeconomic status had a direct relationship with academic optimism.

7. The relationship between socioeconomic status and student achievement was not statistically significant after controlling for academic optimism and collective responsibility, but socioeconomic status had indirect effect on student achievement through academic optimism.

8. The indirect relationship between collective responsibility and student achievement was larger than the indirect relationship between socioeconomic status and student achievement. In other words, the effect of socioeconomic status on student achievement can be countered by the effect of collective responsibility.
Discussion of Results

The Construct of Academic Optimism

The results of this study were consistent with Hoy and his colleagues’ work on academic optimism (Hoy et al., 2006a; 2006b; Smith & Hoy, 2007). The confirmatory factor analysis in this study revealed that academic optimism was also a latent school variable composed of collective efficacy, faculty trust in students and parents, and academic emphasis in Taiwan elementary schools setting. The finding demonstrated that academic optimism as a school construct exists across different cultures or at least in East Asia cultures.

The measurement items that assess the three aspects of academic optimism supported the statistical finding. The scales for collective efficacy, academic emphasis and collective trust used in this study were direct translations from the English versions. After a few minor adjustments, that is, the elimination of several items, the language had little effect on the validity and reliability of the measurement as was demonstrated by the statistical analyses.

A closer examination of the structure of academic optimism revealed that the distribution of the factor loadings among the three sub-concepts was slightly different between schools in Taiwan and America. In the U.S., studies in elementary schools (Smith & Hoy, 2007), for example, indicated that collective efficacy had the highest factor loading (.99), then faculty trust in students and parents (.94), and, finally, academic emphasis (.83). In Taiwan, the results showed that academic emphasis had the highest factor loading (.92), then collective efficacy (.90), and then faculty trust in students and
parents (.88). Although the loadings are slightly different, all are relatively high, and regardless of whether the sample is a U.S. or Taiwan one, they form a latent construct called academic optimism. Nevertheless, it is interesting to theorize that compared to the United States, academic emphasis may be a little more important in Taiwan as an aspect of academic optimism that either collective efficacy or trust.

The general high parental expectation of children to achieve academically in Taiwan (Lin J., 2006; Lin H., 2008) is pervasive. Usually parents in Taiwan press their children to study hard and to pursue higher education. Lin (2008) explained that the origin of this high educational expectation comes from a culture that places a high value on educational success higher than others in most other cultures. The Chinese proverb, “萬般皆下品，唯有讀書高,” a rough translation is “the worth of other pursuits is small, the study of books exceeds them all,” is still deeply valued by many parents in Taiwan. Not only parents, but also students value this high expectation in pursuing higher education. According to Taiwan’s Educational Department’s “Report on Learning and General Life of Middle and Elementary School Students in 1999,” 74% of the elementary to middle school students wanted to pursue bachelor or higher degree; 13% of these students wanted to pursue master’s degree; and 22% of them wanted to pursue doctoral degree. Therefore, embedded in the culture of high expectation for student education, teachers in Taiwan face the pressure to deliver high quality education and to have students achieve academically at high levels. Thus, academic emphasis may take on added importance as an aspect of academic optimism for teachers in Taiwan compared to teachers in the U.S.
The results of this study are consistent with Hoy and his colleague’s theory (Hoy, et al., 2006a; 2006b) that collective efficacy has three components: the cognitive element of academic optimism, the affective aspect of collective trust in clients and finally, academic emphasis, which is the behavioral side of the construct, that is, the behavioral enactment of the cognitive and affective elements of the academic optimism. In brief, the results of this study supported Hoy’s theory of academic optimism.

*The Relationship between Academic Optimism and Student Achievement*

Consistent with previous studies (Hoy et al., 2006a; Smith & Hoy, 2007), the structural equation modeling analysis demonstrated that academic optimism was positively related with student achievement even when controlling for school socioeconomic status in Taiwan. A traditional view of achievement is that success is a function of talent and motivation (Hoy et al., 2006b); smart people work hard and achieve at high levels. Seligman (1999) argues that there is a third factor of success, which is optimism. He asserted that optimism is as important as talent and motivation, and showed that optimism is influential in improving student learning. Although Seligman was talking about individual optimism, there is increasing evidence that organizational optimism, the academic optimism of a school, also facilitates student achievement. Moreover, in this study as well as others (Bandura, 1989, 1997; Hoy et al., 2006a; Smith & Hoy, 2007), the results indicated that academic optimism of a school was actually more important in predicting school achievement than socioeconomic status.

What is surprising is that SES in Taiwan is not as strongly related to student achievement as it is in the U. S. Why might this be the case? One possible reason is that it
is very common for students in Taiwan to go to cram schools after the school is over (Liu, 2006; Liang, 2009). Cram schools are organized by private individuals or companies to tutor students beginning in the elementary school to achieve academically at higher level. According to previous research, around 40% of elementary school students go to cram schools in Hualien (Liang, 2009). In larger cities, such as Taipei, the percentage would be as high as 74.13%. Besides, in contrast to the situation in U.S., these cram schools are not that expensive for a common household. The research showed that the family income distribution of students who do not go to cram school is not different from the distribution of family income of all students (Liu, 2006). In other words, students are not prevented from taking cram courses because of differences in income levels. In brief, the prevailing of cram schooling may be a mediating variable that explains the limited relationship between SES and student achievement in Taiwan.

Another possible reason for the lack of relationship between SES and student achievement in Taiwan might be the difference in the way schools are funded. In Taiwan, schools are not funded by property tax as they are in the U.S. Thus, resources of the local school are not directly related to the wealth of the community. School funding is distributed in an equitable way, which does not penalize the poor. Further, in Taiwan, similar to Zones d'Education Prioritaire (ZEP), the central government implements Educational Priority Areas (EPA) policy in which disadvantaged schools, such as schools with high percentage of minorities, high percentage of low SES students, or high teacher turnover rate, are given additional financial and educational resources. Therefore, it seems reasonable to speculate that the funding policies in Taiwan equalize educational
opportunity to a greater extent than those in the U.S. and result in a lack of connection between SES and student achievement.

The Relationships among Collective Responsibility, Academic Optimism, and Academic Achievement

The data indicated that collective responsibility was directly related to academic optimism in Taiwan elementary schools. The result is not unexpected because previous research in the United States had already demonstrated that collective responsibility was highly related with two of the dimensions of academic optimism - collective efficacy and trust (LoGerfo & Goddard, 2008). Collective efficacy, faculty trust in students and parents, and academic emphasis are always highly interrelated; therefore, it was not surprising that the results of this study also showed that collective responsibility was also highly related to academic optimism.

It seems reasonable to theorize that collective responsibility is a precursor to the development of academic optimism. When teachers develop a strong sense of responsibility for the learning and success of their students, it reinforces their will to continue and persevere: they become more resilient and highly motivated to improve themselves and their students learning (Hoy, 2012). Collective responsibility is an indicator of the unity of teachers in striving for the goal of academic excellence. Further, collective responsibility likely engenders collective efficacy as well as cooperative relations with students and parents as teachers and parents learn to trust each other and move toward a higher level of academic emphasis and success. In fact, collective responsibility has been linked to other variables such as teachers’ participation in
professional communities where participants take joint responsibility for monitoring the quality of the instruction, pedagogy, and student performance (Bolam, et al., 2005). Likewise, Louis, Marks, and Kruse (1996) offered evidence that teachers’ collective responsibility encourages teachers to offer assistance to each other in matters of instruction by contributing extra effort to help students learn. Finally, other researchers have linked collective responsibility to relational trust (Bryk & Schnneider, 2002; Van Maele & Van Houtte, 2009). In sum, collective responsibility is directly related to collective efficacy, collective trust, and academic emphasis — the foundations of academic optimism.

Also, this study is consistent with previous research that found collective responsibility did not vary with socioeconomic status (Lee & Smith, 1996; LoGerfo & Goddard, 2008). The lack of relation between SES and collective responsibility is particularly meaningful because the academic optimism of a school is typically related to SES. Since collective responsibility is positively related to academic optimism, it provides a potential pathway to counter the negative effects of SES on academic optimism. Collective responsibility appears to work with and through academic optimism to produce high student performance. In brief, collective responsibility seems to be an important part of any organizational model that explains academic performance.

**Practical Implications**

The results of this study have several practical values and implications. Although it is a little early to make many practical suggestions, a few proposals for practicing administrators seem in order.
This research has demonstrated that academic optimism is an important school-level construct that influences student outcomes even after controlling for SES in different cultural settings. Although the scope of the research only focused on schools in Taiwan, the conclusion should be adaptable to other cultures, at least in East Asia; in other words, academic optimism is a school construct that has general application in a variety of settings. Therefore, not only educational administrators in the U.S., but also educational administrators in other countries should be concerned with the level of academic optimism in their schools because high optimism likely provides an organizational culture that facilitates student achievement.

Academic optimism is also important because it provides a new perspective on educational policy making (Hoy, 2012). On the one hand, the construct suggests at least three separate ways to significantly improve student achievement: by promoting collective efficacy, creating collective trust, and strengthening academic emphasis (Hoy et al, 2006a; 2006b; Smith & Hoy, 2007). Consequently, educational administrators have three pathways to design a policy or program that could effectively enhance school achievement. For example, collective efficacy could be enhanced by developing mastery experiences for teachers, providing them with models of successful teaching, and persuading teachers to believe in themselves and their capabilities (Bandura, 1997; Goddard, et al., 2004). Faculty trust in students and parents can be promoted by useful interchanges and cooperative opportunities between parents and teachers, both formal and informal ones (Hoy, 2006a; Forsyth et al., 2011). Academic emphasis could be increased by celebrating the achievements of faculty whose students excel in learning,
emphasizing honor rolls for high achieving students, and acknowledging exemplary student work of all kinds (Hoy et al., 2006a).

On the other hand, the construct of academic optimism also offers a synthesized view on how to evaluate the effect of a policy or program as a whole. Usually people think that collective efficacy, faculty trust in students and parents, and academic emphasis are three separate concepts. Therefore, policy makers might be inclined only to consider the influence of one concept at a time when formulating a new policy. The theory of academic optimism helps administrators see a bigger picture. Because collective efficacy, trust, and academic emphasis are intertwined deeply with each other, any intervention or policy designed to improve one aspect of academic optimism must be considered in terms of how it influences the other two elements (Hoy, 2012).

If a program improves one aspect at the expense of the other two, the results would likely be counterproductive. For instance, a merit pay system might be able to improve academic emphasis by enhancing the competition among teachers. But in the process, collective efficacy might be hurt because the high competition among teachers may cause them unable or unwilling to cooperate with each other on teaching. Trust between teachers and parents could also be reduced because parents probably would have more doubt about the competence of teachers who didn’t receive a merit award since competence is an important element of trust. After calculating the potential effects of the intervention on all three aspects of academic optimism, the results might only have marginal or some negative effects on academic optimism. Thus, the implementation of the change seems unwise.
If academic optimism is important for student achievement, the next question is how can we improve it? Previous research has demonstrated that enabling school structure (McGuigan & Hoy, 2006) and distributed leadership (Mascall et al., 2008) promote academic optimism. The results of this study indicated that another school variable, collective responsibility, is positively related to academic optimism. The importance of collective responsibility is that according to this research, it is free from the influence of SES. In other words, collective responsibility is a school variable that can be influenced by principals or school administrators, and through which, academic optimism and student achievement in low SES schools can be improved.

There are several ways for school leaders to promote collective responsibility. First, they can help teachers gain an internal locus of control about children’s learning. Teachers need to believe that they can at least make some contribution to children’s learning and accept responsibility for it. When teachers become responsible for their students, they begin to experience what they do is valuable to student learning. That doesn’t mean that teachers need to experience great success with every student; even small achievement could bolster this belief (Johnson & Birkeland, 2003).

One way to gain an internal locus of control is to define success broadly (LoGerfo, 2004). Rather than only focus on academics, success should be construed to include social and psychological accomplishment. The expanded definition of success may sustain teacher responsibility when academic achievement is not progressing quickly. For instance, if success were reflected in student’s engagement in reading, slow progress in reading test scores might not cause teachers to give up on these children early. As long as
students start to show more interest in reading, this increased engagement could provide teachers the excitement, motivation, and self-efficacy to carry on and accept more responsibility for children. Thus, for school leaders, setting broader and suitable standards of success for their schools is a crucial step for improving collective responsibility.

Second, school leaders should help teachers develop meaningful shared goals. People are more willing to be more responsible on the subject or goal that is both relevant to them and agreed by them. Thus, the goals of the teachers should be shared with colleagues in their professional community. Only activities that focus on shared school goals are likely to promote collective responsibility (LoGerfo, 2004, Whalan, 2010). For example, professional development is not likely to productive if it is fragmented, not meaningful, or is not related to mutual teacher goals.

Third, school administrators should help foster trust and authentic professional community. Common school goals are not enough. If teachers don’t trust each other, collective efficiency and the effect of the collaborative work is undermined by tensions and disagreements, which creates a situation called a pseudocommunity (Grossman et al., 2000). In such a community, individuals might agree to enact the school’s goals without either understanding a common purpose or having a sense of efficacy to work with others to achieve these goals. For collective responsibility to develop more fully, school leaders must create situations in which teachers feel free to let go of comfortable practices and stay open to new ideas.
In sum, school leaders should reduce obstacles to collective responsibility by fostering teacher internal locus of control for student learning, by nurturing mutual school goals, and by developing an authentic professional community. To these ends, school leaders must be supportive. They need to help and shield teachers from internal impediments and external pressures. For instance, they should limit paper work, “red tape,” and other routine duties that interfere with teaching and learning (LoGerfo, 2004; Hoy & Sweetland, 2000, 2001). Further, when teachers encounter unjustified complaints from parents, administrators should step up and defend their teachers from these unwarranted external pressures. Being supportive is crucial in fostering school wide collective responsibility (LoGerfo, 2004; Whalan, 2010).

**Research Implications**

The results of this study provide several directions for future research. First, the findings from this study demonstrated the existence of academic optimism in Taiwan. This finding in Taiwan suggests that the construct is generalizable outside the United State. Future research in other culture settings, such as Middle East or Africa, is needed to broaden its generalizability. Also, it was a little surprising that the measure of academic optimism worked quite well without major changes in language. Nevertheless, research in other countries should always check for cultural relevance and refine the measure accordingly.

Second, the finding of this research provided support for the hypotheses that collective responsibility is related to academic optimism, and academic optimism is related to student achievement. Collective responsibility and academic optimism are both
important parts of the model. For future studies, a fruitful way to develop new research questions is to examine groups of variables that are related to key concepts in the current model with the goal of creating a more comprehensive theory to explain student achievement. Two sets of school variables that are intriguing for further exploration with respect to academic optimism are school leadership variables and collective teacher variables.

School leadership encompasses such variables as enabling school structure (McGuigan & Hoy, 2006), instructional leadership (Alig-Mielcarek & Hoy, 2005), and distributed leadership (Masscal et al., 2010). School leadership variables are candidates for inclusion in the model because they are directly related to principals, and the principal is the single most important person in the school (Halpin, 1966; Hoy & Tarter, 2004). Investigating the relationships among school leadership variables, collective responsibility, and academic optimism can provide us a better understanding about how a principal can create a school culture that enhances teacher and student motivation and encourages teachers to focus on student learning. For example, enabling school structure has been linked to academic optimism; schools with high levels of enabling structure generally have higher levels of academic optimism. That is, enabling structure creates conditions that lead to higher levels of academic optimism (McGuigan & Hoy, 2006). Although enabling school structure is not directly related to student achievement it provides the infrastructure for building a culture that emphasizes trust, efficacy, and academic success. Consider the following questions:
1. To what extent is enabling structure related to academic optimism in Taiwan schools?
2. Is enabling structure both directly and indirectly related to academic achievement?
3. To what extent is the transformation leadership of the principal related to academic optimism of the school?
4. To what extent is the instructional leadership of the principal related to the academic optimism of the school?
5. To what extent is participatory decision making of the principal related to the academic optimism of the school?
6. To what extent is distributed leadership related to the academic optimism of the school?

Collective teacher variables are school variables that consider teachers as a united group, such as organizational citizenship (DiPaola & Tschannen-Moran, 2001), collective responsibility (Lee & Smith, 1996; LoGerfo & Goddard, 2008), professional learning community (Bryk & Schneider, 2002; Bryk, et al., 2010; DuFour, 2004; Louis & Marks, 1998), and relational trust (Bryk & Schneider, 2002; Forsyth et al., 2011; Van Maele & Van Houtte, 2009). For instance, organizational citizenship could be an important school variable to be included in the model because it also was related to student achievement after controlling for SES (DiPaola, Tarter, & Hoy, 2005; Tarter & Cooper, 2011). Theoretically, collective responsibility is the antecedent to organizational citizenship. When teachers have strong sense of collective responsibility, they are more willing to help each other because they view the success of every student as their duty. Also,
organizational citizenship is directly related to academic optimism because these mutual-helping behaviors could increase the three elements of academic optimism simultaneously (DiPaola & Wagner, 2012). Thus, potential questions for future research are as follows:

7. To what extent is collective responsibility a predictor of organizational citizenship?
8. To what extent is organizational citizenship a predictor of academic optimism?
9. Is organizational citizenship directly or indirectly related to student achievement after including academic optimism in the model?
10. To what extent is relational trust an antecedent of collective responsibility and organizational citizenship?

Professional learning community is another variable that is often theorized to be related to academic performance (Bryk & Schneider, 2002; Bryk, et al., 2010; Louis and Marks, 1998). Thus a number of further questions emerge:

11. To what extent is professional learning community related to academic optimism?
12. To what extent is professional learning community related to academic achievement?
13. To what extent is professional learning community related to collective responsibility?
14. To what extent is professional learning community related to organizational citizenship?

Although the hypotheses mentioned above were not tested, a more complete model could be generated from them for future research. The model presented in Figure 5.1 is an exploratory path model that incorporates most of the variables that have been
discussed. Of course, there are other variables that might be added as future research unfolds, but the proposed path model seems like a reasonable beginning point.

Figure 5.1: Suggestion for Future Exploratory Path Model.

**Conclusion**

The results of this research have been encouraging. Academic optimism is a useful construct that works in Taiwan in much the same way as it does in the United States. It seems likely the concept will also be fruitful in many other countries and
cultures. The current research also extended the theory of academic optimism by demonstrating the utility of collective responsibility as a significant factor that has a positive influence on academic optimism and an indirect effect on academic achievement.

After struggling for decades, researchers (Bryk and Schneider, 2002; Bryk, et al., 2010; Coleman, et al., 1966; DiPaola & Wagner, 2012; Forsyth, Adams, & Hoy, 2011; Goddard, Salloum, & Berebitsky 2009; Hoy, Tarter, and Woolfolk Hoy, 2006; Hoy, 2012; Lee & Shute, 2010; Tschannen-Moran, 2004) are finally beginning to piece together the important properties of school organization that facilitate academic performance. The current research adds to that ongoing effort in a modest way and identifies some future directions for moving forward in the quest to understand how schools can be designed and shaped to improve academic performance.
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