

Teacher's Academic Press and Student Achievement in Reading Comprehension

by

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## List of Abbreviations/Acronyms

Free/Reduced Price Lunch – FRL

Hierarchical Linear Modeling – HLM

Iowa Test of Basic Skills – ITBS

Limited English Proficient – LEP

Mid-Continent Research for Education and Learning - McRel

National Assessment of Educational Progress – NAEP

No Child Left Behind – NCLB

Organizational Health Inventory – OHI

Professional Learning Communities – PLC

Reading First – RF

Teacher’s Academic Press – TAP

## Abstract

In this dissertation, I investigated a new form of academic press that focuses on the collective belief of a faculty in mastery learning and high expectations for all students. This construct, Teacher's Academic Press (TAP), may explain why some schools are more effective than others at raising student achievement. To explore this, I addressed two research questions. The first dealt with the validity of the scale used in this study and the reliability of the collected scores. The second research question examined the relationship between TAP and the performance of second and third graders in reading comprehension.

This study was conducted in 157 Reading First schools in Michigan with 1,841 teachers and 12,317 students in second and third grade. TAP was assessed through eight teacher survey items that were aggregated to the school-level and factored together. Validity for the scale was established in three areas: evidence based on questionnaire content, evidence based on internal structure, and evidence based on relation to other variables. Additionally, reliability was established with a Cronbach's alpha of 0.92. To address TAP's relationship to student achievement, three level HLM models were constructed with students' standardized score on the ITBS reading comprehension subtest as the outcome. Separate models for second and third grades included student demographic covariates at the student-, classroom-, and school-levels, as well as four school-level correlates of TAP (teacher-teacher trust, reflective dialogue, quality of

professional development, and innovation). Results indicated that TAP had a positive association with student achievement in both grades ( $\beta = 0.027$  in second grade and  $\beta = 0.033$  in third grade). In addition, the models explained a large amount of variance at all three levels.

Results of this study indicate the TAP scale demonstrated validity and the scores demonstrated reliability, which indicates that TAP has the potential to be a useful measure of school culture. The positive findings in the achievement models imply that TAP explains some of the differences in reading achievement between schools. This finding is encouraging given that TAP is a malleable characteristic of a school as compared to student demographics.

## Chapter 1

### Introduction

Despite concerted efforts to improve the reading achievement of elementary students, recent results from the 2009 National Assessment of Educational Progress (NAEP) indicated that one third of fourth graders in the United States failed to achieve at even the most basic levels of reading achievement (National Assessment of Educational Progress, 2010.a). This problem is exacerbated when you look at how children living in poverty perform on reading assessments in comparison to their peers. Students who were eligible for free and reduced price lunch, a commonly used proxy for poverty, were significantly more likely to fall into the below basic level on NAEP reading when compared to their peers of higher socioeconomic status. Nearly half of all free and reduced price lunch students were in the below basic level, while only 20% of non-eligible students were in the lowest category (National Assessment of Educational Progress, 2010.b). Children who do not acquire basic reading skills in the early elementary years have been found to underachieve in reading, vocabulary, and general academic achievement in the high school years (Cunningham & Stanovich, 1997). It is in these formative early years of schooling that students develop the skills needed for future learning (Perez-Johnson & Maynard, 2007).

The No Child Left Behind Act of 2001 (NCLB) sought to address these achievement problems; in fact, the number one priority listed in President Bush's

proposal for NCLB was to improve the academic performance of disadvantaged students (Bush, n.d.). In the legislation, one of the goals of the administration was to ensure that all children could read by the end of third grade, and one way they sought to do this by creating the Reading First (RF) initiative, which provided states with funds as well as other tools to improve reading through the use of scientifically-based reading instruction programs (No Child Left Behind Act of 2001, 2002).

The effectiveness of large-scale reforms like NCLB have been mixed with some showing improvement in student achievement while others have struggled to affect learning. For example, the RF initiative has not always had the intended positive impact on reading achievement. The Reading First Impact Study found that RF did not positively impact reading comprehension scores in grades one, two, or three (Gamse, et al., 2008). In another example though, RF schools in Lansing, MI seemed to make greater gains in word analysis, vocabulary, and reading comprehension scores as compared to non-RF schools (Carlisle, Schilling, Zeng, & Kleyman, 2006). Policymakers are left wondering why some RF schools seem to be improving reading achievement while others are failing to make the same gains.

One possible reason RF has not had a consistently positive influence across all schools may lie in the social system of the school. Social systems exist in all organizations and emerge as different personalities organically interact (Waller, 1932). The social system in a school is defined by “an interdependence of parts, a clearly defined population, differentiation from its environment, a complex network of social relationships, and its own unique culture” (Hoy & Miskel, 2001, p. 22). Figure 1.1 below summarizes the major elements of a school’s social system. In this model, inputs (e.g.,

the abilities of students entering the school) are taken into the organization and then transformed by the system to produce desired outputs (e.g., student achievement). At the center of the transformation process is teaching and learning, which is heavily influenced by the four subsystems (structural, political, individual, and cultural) as well as the external environment of the school. I next discuss the ways in which large-scale reforms deal with each of these subsystems.

Reforms seek to influence teaching and learning by enacting policies that alter these four subsystems. Policymakers often work within the structural system, which encompasses the formal bureaucratic roles of organizational members, the hierarchy of offices and positions, and the formalized rules and regulations (Hoy & Miskel, 2001). The structural system represents the formal dimension of the school, such as the curriculum, the composition of the school day, and the decision-making hierarchy. Policymakers in Michigan focused on the structural aspect when they required that all RF schools assess students with both the Iowa Test of Basic Skills and the Dynamic Indicators of Basic Early Literacy Skills. In addition, many policies seek to affect the individual system. The individual system in a school deals with the personal beliefs, needs, knowledge, and cognitive understandings of members. NCLB sought to influence the individual system by mandating standards of teacher quality; these standards included having state certification, a bachelor's degree, and competence on a content-area proficiency test. The political system of an organization is focused on the system of power relations. Politics can manifest both formally and informally as organizations have both formal leaders (e.g., principals) and informal leaders (e.g., experienced, master teachers). Some policies have sought to influence the political system by establishing

more formal leaders. For example, RF instituted literacy coaches in all schools. In many schools, these coaches represented not only a new structural element but also a new authority that altered the power dynamics within the school.

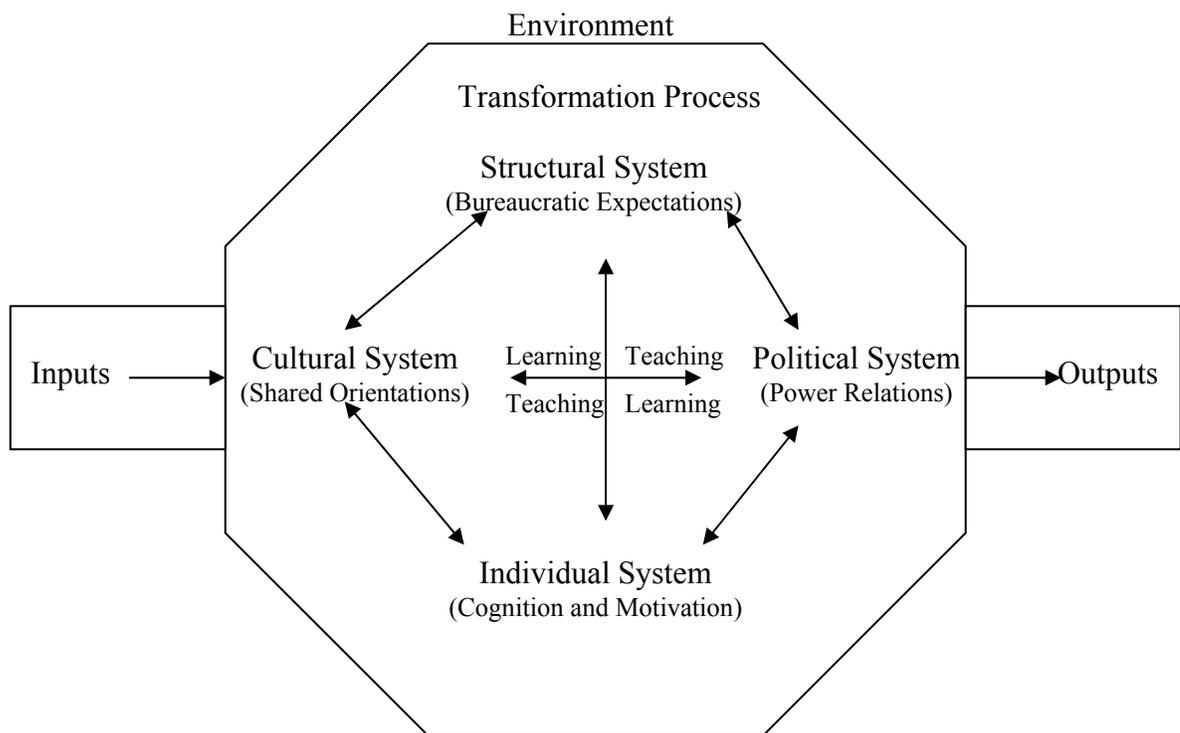


Figure 1.1. Social Systems Model in Schools.

Finally, the cultural system can be difficult for policies to reach, but it is no less important. The culture of a school is defined as the “shared orientations that hold the unit together and give it a distinct identity” (Hoy & Miskel, 2001, p. 176); it is part of the informal organization, which refers to the unofficial leaders, norms, values and more that influence all organizations. It can include shared norms, values, philosophies,

perspectives, beliefs, expectations, attitudes, myths, and ceremonies, and all of these cultural characteristics of informal social systems can influence the outcomes of policy in ways in which policy cannot formally control.

Organizational culture has three levels: tacit assumptions, values, and norms (Hoy & Miskel 2001). Tacit assumptions are the most abstract and deep aspect of culture; they deal with the abstract premises in the organization (e.g., human nature, relationship to the environment). Values, which are less abstract and more superficial, are descriptions of what is desirable in an organization such as trust and collaboration. The most concrete and superficial level is norms, which represent the unwritten and informal expectations that influence behavior. In a school, examples of norms include being available to give students extra help and supporting colleagues. All three levels of culture influence the behavior of people in the organization and thus how teachers choose to respond to policies.

One of the most commonly cited characteristics of a school's culture is academic press (Scheerens & Bosker, 1997). In the literature, academic press has traditionally been defined as the extent to which school members, including teachers, administrators, and students, are motivated by achievement-oriented goals, values, and norms (Shouse, 1996); it is "the extent to which the school is driven by a quest for academic excellence" (Hoy, Sweetland, & Smith, 2002, p. 79). This area of organizational culture encompasses school policies, practices, expectations, and norms (Lee, Smith, Perry, & Smylie, 1999; Murphy, Weil, Hallinger, & Mitman, 1982) and through these factors, academic press exerts a normative authority in the school that socializes the behavior of teachers, students, and other school members (Bryk, Camburn, & Louis, 1999). Coleman (1990)

discussed the importance of social norms in schools. Norms, which are properties of a social system, inform an actor in the system whether or not his or her actions are appropriate. To have a strong norm in a social system, consensus must emerge about the norm as well as the rewards and punishments that are employed to ensure that actors perform accordingly. In some cases, the target of a norm and the beneficiaries of that norm are not necessarily the same person or persons; this is referred to as a disjoint norm. Academic press can be considered a disjoint norm, as the targets are the faculty, while the beneficiaries are the students. As a norm, academic press thus socializes teachers to direct their instruction, as well as other decisions and actions, to best support student learning. Reinforcing this theory, academic press has been repeatedly linked to student achievement in empirical research (e.g., Goddard, Sweetland, & Hoy, 2000; Lee, Smith, Perry, & Smylie, 1999).

Traditionally, researchers have measured academic press in a number of ways. Most often, they asked teachers to assess student culture (e.g., Goddard, Sweetland, & Hoy, 2000; Smith, 2002), although many other measures incorporated students' perceptions of teacher norms around academic success (e.g., Bryk & Thum, 1989; Lee, Smith, Perry, & Smylie, 1999). Other researchers went beyond survey data and combined indicators of the academic climate in schools, such as the number of Advanced Placement courses offered, student course enrollment, and the amount of homework assigned (e.g., Phillips, 1997; McNeal, 1997). None of these studies, however, focused exclusively on teachers' assessments of the level of normative expectations for academic success in their schools. Teachers' perceptions of the collective beliefs in the school are

an important part of the cultural system, and there is not extensive research into this area of academic press.

In recent research (McRel, 2005; Goldring, Huff, May, & Camburn, 2008), authors have focused specifically on collective teacher beliefs when measuring academic press. Furthermore, both studies employed a more focused definition of academic press that emerged from the work of Scheerens and Bosker (1997) and Marzano (2000). I define this form of academic press, which I refer to as teacher's academic press, as the collective belief in a school in high expectations for all students and mastery learning. This definition represents an evolution in the conceptual framework of academic press by dealing more specifically with the norms of the faculty and not school characteristics that are more parts of the structural system such as course offerings. The construct of teacher's academic press is thus placed squarely in the cultural system of the school and represents a new iteration of the conventional academic press construct.

As mentioned, conventional academic press has consistently shown a positive relationship with student achievement. However, the association between teacher's academic press and student achievement has not been examined. The two empirical studies that have studied teacher's academic press either linked it to principal's practice (Goldring, et al., 2008) or employed it as an indicator of school environment and examined its associations with professional community, leadership, and instruction (McRel, 2005). However, neither study directly examined the association between teacher's academic press and student performance. Teacher's academic press has the potential to be a powerful dimension of the school cultural system and thereby influence outputs such as student achievement.

Given that many large-scale reforms, like NCLB, are seeking to raise achievement for all students regardless of race or socioeconomic status, a school characterized by a high level of teacher's academic press may foster a cultural system that improves student achievement. Investigating this aspect of school culture may explain why some reforms are effective while others fail. In this dissertation, I seek to investigate whether or not teacher's academic press significantly impacts student achievement in Michigan's RF schools.

## Chapter 2

### Literature Review

In this section, I review the literature relevant to teacher's academic press. I begin by discussing how researchers have defined conventional academic press, and then how it has been operationalized in the research literature with particular attention paid to articles that examined the relationship of conventional academic press to student achievement and other important measures such as student behavior, faculty turnover, and collective efficacy. Examining this literature elucidates how teacher's academic press emerges from traditional press but is also distinct from it. I proceed with a definition of teacher's academic press and the two studies that have measured it previously. I follow this discussion by showing how teacher's academic press is related to the construct of collective focus on student learning from the professional learning community literature. I end this section by providing my research questions and the rationale behind them.

#### Conventional academic press: A Definition

“Academic press focuses on the extent to which school members, including teachers and students, experience a normative emphasis on academic success and conformity to specific standards of achievement” (McDill, Natriello, & Pallas, 1986, p. 8). As a facet of the cultural system of a school, academic press is a school-wide, not individual, characteristic (Hoy, Sweetland, & Smith, 2002). In a school characterized by

a high level of academic press, teachers and administrators set high but achievable goals, create an orderly and serious learning environment, and believe in students' abilities (Hoy & Hannum, 1997).

In a study of a school effectiveness program in Santa Clara County, CA, Murphy and colleagues (1982) took a wider view of academic press by including school policies and classroom practices into their theoretical framework. They argued, "school policies... that promote the belief that all students can achieve grade-level objectives (for instance, mastery learning) convey to all that the school expects, demands, and works to ensure high levels of student achievement for all students" (p. 24). In the article, the authors put forward a working model of how academic press is created and acts in schools. This model (see Figure 2.1) links the belief structure of the faculty and principal of the school to the staff responsibility for student learning to school policies and classroom practices. In turn, policies and practices affect students.

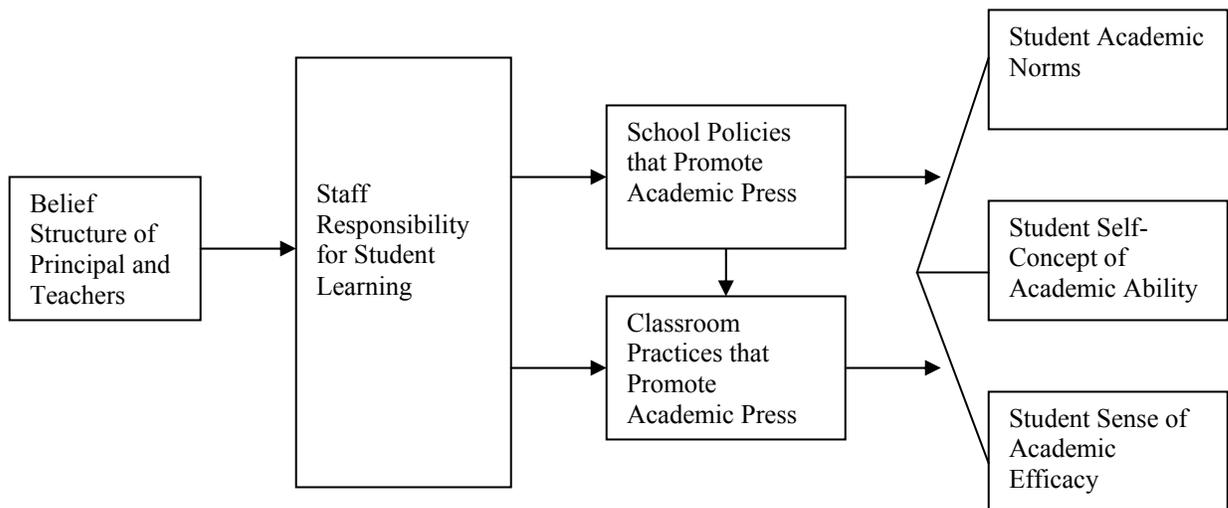


Figure 2.1 Working Model of Academic Press in Schools (Murphy, et al., 1982)

These researchers went on to theorize that students that experience this academically oriented environment, where teacher beliefs, classroom practices, and school policies are all geared towards academic press, will most likely feel compelled to work hard and respect their peers who have academic success (Murphy, Weil, Hallinger, & Mitman, 1982). The Parsonian framework (1967.a) offers insight into how this collective norm can influence student behavior and achievement. Parsons (1967.b) theorized that a school asserts three levels of influence: technical, managerial, and institutional. The technical level deals with the primary mission of the school (i.e., teaching and learning); the managerial encompasses leadership and the use of resources; and the institutional focuses on how the school interacts with its external environment. In a healthy and effective school, all three levels work harmoniously (Hoy & Hannum, 1997). Academic press works in the technical level (Roney, Coleman, Schiliching, 2007), and in a high academic press school, the policies, practices, expectations, norms, and rewards all focus on the quality of teaching and learning, which is at the heart of the school's social system (Hoy & Miskel. 2001).

The Murphy et al. (1982) framework shows how aspects of the cultural system (teacher's belief structures) could influence the technical core (classroom practices) as well as areas of the structural system (school policies). However, this framework also posits that academic press consists of practices, policies, and beliefs, thus blurring the lines between the different subsystems of the school's social system. Consequently, many researchers have quantified academic press in schools by combining pieces of these different subsystems into one omnibus measure, and in doing so, the independent contributions that areas such as teachers' beliefs had on outputs, such as student

achievement, were lost. In the next section, I discuss the variety of ways that academic press has been operationalized and as a result how teacher's academic press represents a new way to think about this aspect of school culture.

### Conventional academic press: Measurement and Analysis

A number of studies have sought to measure academic press and analyze the ways in which it influences student achievement as well as other important outcomes such as faculty turnover and the odds of students dropping out. However, researchers have not used a consistent operationalization of academic press. To facilitate a discussion of the research on conventional academic press, I discuss the research studies as they fall into three groups based on the ways in which academic press was measured. The first deals with the Effective Schools movement. It is in this research that academic press first emerged as a consistent correlate of achievement. These studies contain similar theoretical frameworks as well as similar methodologies. The Effective Schools literature also emerged earlier chronologically than the other work on academic press. The second area focuses on studies that employed the Organizational Health Inventory (OHI), a commonly used survey instrument developed by Hoy and Feldman (1987), to measure conventional academic press. The final area includes post-Effective Schools research studies that did not use the OHI instrument. These studies measured academic press in a variety of ways.

### Effective Schools Research

Though some early educational research discussed the idea of schools as a place where academic learning was the core value (Waller, 1967), the construct of academic press really emerged in the 1970's and 1980's as part of the Effective Schools movement (Phillips, 1997). The Effective Schools literature emerged as a response to Coleman and colleagues (Coleman et al., 1966). The Coleman Report, commissioned as part of the Civil Rights Act of 1964, found that schools accounted for very little of the variation in student achievement when controlling for student characteristics, such as socioeconomic status. Authors of the Effective Schools movement sought to show that schools could have more of an effect on student achievement than Coleman and colleagues found. The research of the Effective Schools movement focused on the processes of effective schooling primarily through the use of case studies of outlier schools (Reynolds, Teddlie, Hopkins, & Stringfield, 2000), which were mostly conducted in the 1970's and early 1980's. These studies were grouped by their use of similar methodology and their goal to demonstrate that school-level characteristics could positively influence student achievement. One of the main characteristics to emerge from this work was academic press.

One of the first Effective Schools pieces was Weber's (1971) case study of the characteristics of four urban schools that had demonstrated success in raising reading achievement for poor children. All four of these schools demonstrated strong leadership, high expectations for all students, an orderly atmosphere, and an emphasis on acquisition of reading skills reinforced by frequent evaluation. These last three criteria include all facets of conventional academic press. Weber also specifically pointed out that high expectations were necessary but not sufficient criteria for success. In another early study

of the Effective Schools literature, Gigliotti and Brookover (1975) compared 10 similar high and low achieving elementary schools in Michigan. They identified five environmental themes that were crucial to the success or failure of a school, and one of these themes was the belief of actors in the environment that students should be successful (i.e., academic press from teachers and staff).<sup>1</sup> The authors defined this press for achievement as the emphasis placed on the need for future educational accomplishments, which they measured via several items from a teacher survey. The items focused on the extent to which teachers stress the importance of school achievement to students; however, no items were included in the publication. The researchers also measured teacher's academic expectations of students. They found that higher achieving schools tended to have a higher level of teacher press for achievement.

Edmonds, one of the most prolific authors of the Effective Schools literature, argued strongly in his work that schools can and do make a difference. He, along with Lezotte and Ratner, examined twenty schools from Detroit's Model Cities Neighborhood and then reanalyzed the 1966 Equal Educational Opportunity Survey dataset, the data used in the Coleman Report, to better understand how urban schools were working effectively with poor students (Edmonds, 1979; Edmonds & Fredriksen, 1979). They identified more and less effective schools from these samples and then compared characteristics of these schools, based on survey responses. Five important school-level correlates to student achievement were found: (1) strong administrative leadership, (2) high expectations for student achievement, (3) an orderly atmosphere that is conducive to learning, (4) an emphasis on basic skill acquisition, and (5) frequent monitoring of

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<sup>1</sup> The other four themes were positive valuations of the academic enterprise, awareness by students of positive valuations and teachers' beliefs, acceptance by students of positive valuations and teachers' beliefs, and supports for creating and maintaining positive valuations and beliefs.

student progress. These findings were incredibly similar to Weber's results, and these correlates became mainstays of the Effective Schools literature.

Rutter and colleagues (1979) identified a number of these same correlates in a study of secondary schools in London. The authors first assessed ten-year olds on general aptitude, reading achievement, and behavioral problems and then followed up with students both four and six years later. Academic press, teaching behavior, use of reward and punishment, degree of student responsibility, staff stability, and staff organization were all linked to academic achievement. Positive expectations were also associated with less disruptive student behavior. Brookover and colleagues (1978) looked at school inputs, social structure, and social climate in 68 elementary schools. The authors collected data from each school in the areas of school inputs, school social structure, and school social climate. In their survey, they asked students about their perceived expectations and the academic norms characterizing the school. Teachers and principals were also asked about their perceptions of expectations. One interesting aspect of this study is the inclusion of school demographics in the analysis. The authors found that climate played out differently in schools, depending on the race of the majority of students. For example, teachers' expectations of student achievement had a significant effect in a step-wise regression analysis with student achievement variance as an outcome in majority white schools but not in majority black schools. This work, while supporting the importance of the measures of climate, indicates that research needs to consider the demographic context of the school.

In a meta-analysis of the school effectiveness literature, Scheerens and Bosker (1997) identified nine school-level characteristics that consistently emerged as significant.<sup>2</sup>

1. Achievement Orientation/High Expectations
2. Consensus and Cohesion among Staff
3. School Climate/Classroom Climate
4. Evaluative Potential
5. Curriculum Quality/Opportunity to Learn
6. Effective Learning Time
7. Parental Involvement
8. Structured Instruction
9. Educational Leadership

Most of the factors in this list deal with the actions of teachers, school leaders, and other staff. Consensus and cohesion among the staff focuses on the quality and extent to which teachers work together; effective learning time deals with how the faculty maximizes the amount of time allocated for instruction; and evaluative potential encompasses the ways in which a school articulates academic goals and monitors student's progress in meeting those goals. However, two of the factors--school climate and achievement orientation/high expectations--focus more on the beliefs and attitudes of the faculty and staff. The latter factor encompasses a clear focus on mastery of basic subjects, high

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<sup>2</sup> The authors actually identified thirteen different characteristics; however, some of them were more attuned to the classroom- or teacher-level and not the school-level. These included classroom climate, independent learning, differentiation, and reinforcement and feedback.

expectations, and the use of records to monitor student progress. This framework formed the foundation for teacher's academic press, which I will discuss further below.

The Effective Schools literature emerged to show that school-level measures could influence student achievement above and beyond student demographics. The researchers in this area identified a number of correlates that were associated with the success or failure of a school, and one of the most consistently area cited was academic press. Aspects of academic press, such as high expectations, orderly atmosphere, and basic skill acquisition, were regularly mentioned in this research as being indicators of an effective school. However, a number of these studies only focused on schools that were at the ends of the effectiveness spectrum, and thus a wide variety of school contexts were not studied. In addition, much of this research was not very methodologically advanced. Statistical methods of the time did not include multilevel modeling and other advances that would allow future researchers to better measure the effect of academic press on student achievement.

#### Organizational Health Inventory

In the late 1980's, the Effective Schools movement tapered off as researchers began to examine all schools and not just the outliers that lay at the ends of the effectiveness spectrum. In the studies that emerged following the Effective Schools movement, academic press was measured a variety of ways. One of the most common survey instruments used in assessing the academic press in a school was the Organizational Health Inventory (OHI), which is based on Edmond's work (Hoy & Feldman, 1987, 1999). Different instruments were constructed depending on the level of

school (elementary, middle, or high), and items from all three instruments are listed below.<sup>3</sup>

1. Students neglect to complete homework. (reverse coded)
2. Students are cooperative during classroom instruction.
3. Students respect others who get good grades.
4. Students seek extra work so that they can get good grades.
5. Students try hard to improve on previous work.
6. The students in this school can achieve the goals that have been set for them.
7. The school sets high standards for academic performance.
8. Teachers in this school believe that their students have the ability to achieve academically.
9. The learning environment is orderly and serious.
10. Students make provisions to acquire extra help from teachers.
11. Good grades are important to the students of this school.
12. Academically oriented students in this school are ridiculed by their peers.  
(reverse coded)

Nearly all of these items are oriented towards the beliefs and actions of students. Only three of the items dealt with the beliefs of teachers (item 8) or the academic environment of the school (items 7 and 9). This survey scale has been used in a number of studies to link academic press to student achievement as well as to other outcomes.

The OHI has been widely used in the research literature, and I present just a few of the most relevant pieces. Smith (2002) showed that academic press was linked to

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<sup>3</sup> All items can be found on <http://www.waynekhoy.com>.

twelfth grade math achievement in a study of 97 high schools in Ohio; however, the analysis was conducted solely at the school-level and did not use multilevel modeling methods. Roney, Coleman, and Schlichting (2007) used a mixed-methods approach to investigate five middle schools in two North Carolina school districts. They found an association between increased achievement in reading and increased levels of traditional academic press in the school, but the authors were not able to move beyond basic statistical analyses (correlations and *t*-tests) due to the small sample size. The most advanced methodology was employed by Goddard, Sweetland, and Hoy (2000), who used the OHI as well as multilevel modeling to link academic press to both math and reading achievement in elementary schools. This research was conducted in 45 schools in a midwestern urban district.

Moving beyond achievement outcomes, Bevans, Bradshaw, Miech, and Leaf (2007) found negative associations between academic press and faculty turnover and academic press and student mobility. They also employed multilevel modeling techniques in their analysis of 1395 teachers in 37 elementary schools. Hoy, Sweetland, and Smith (2002) examined 97 high schools in Ohio. They employed path analysis at the school-level to investigate the relationships among academic press, socioeconomic status, collective efficacy and student achievement. In this analysis, academic press was not significantly associated with average twelfth grade mathematics achievement, but it was positively related to collective efficacy, which was significantly linked with achievement. Licata and Harper (1999) were able to use the OHI instrument to show that conventional academic press positively associated with teacher's assessment of the robustness of the school environment. The authors conducted multiple regression analyses on 45 junior

high and middle schools. The OHI has also been used internationally. Korkmaz (2006) employed multiple regression and the OHI instrument in 50 elementary schools in Turkey where he linked academic press to a similar measure of robust school vision used by Licata and Harper (1999).

Through these studies that employed the OHI, academic press was repeatedly linked to student achievement as well as other important measures such as collective efficacy, faculty turnover, and robust school environment. Many of these studies also used more sophisticated methods than had been used in the Effective Schools literature. The OHI focuses mostly on teachers' perceptions of students' actions and attitudes, and although a few of the items deal with collective teacher beliefs, they were generally minimized in these research studies.

#### Other Studies

Not all contemporary studies investigating academic press have used the OHI. A number of researchers constructed measures of academic press by combining a vast array of school indicators including policies, homework practices, student attitudes, teacher beliefs, and more. These studies continued the work on associating academic press and student achievement as well as academic press and other important outcomes, such as the probability of students dropping out and the level of social cohesion in the school.

Lee, Smith, Perry, and Smylie (1999) constructed a measure of academic press that was based on teacher and student surveys; teachers answered questions about setting high standards for academic performance, organization of the school day, and a focus on what is best for student learning when making decisions. Students were asked to assess

whether their English and math teachers expected them to do their best all the time, expected them to complete homework every night, thought it was important that they do well in their class, and encouraged them to do extra work when they did not understand something. The authors, using data from over 28,000 students and 304 Chicago elementary and middle schools and Hierarchical Linear Modeling (HLM), were able to link this measure of academic press with achievement in both math and reading for sixth and eighth graders.

Another study combined teacher beliefs and classroom practices in constructing a measure of academic press. In examining 23 middle-class majority African-American middle schools in a suburban area, Phillips (1997) combined teachers' expectations (from teacher reports), the percentage of students taking algebra, and the amount of homework (from student reports) to construct a measure of academic press. The author found that the level of academic press in a school positively influenced both student attendance and math achievement. In another study, Huang, Waxman, and Wang (1995) compared organizational cultures in five high and six low performing inner-city elementary schools. Teachers' survey responses showed that the higher performing schools had a stronger student academic orientation. Unfortunately, the items used in the survey were not published; the authors provided only one sample item, "Students are interested in learning new things" (Huang, Waxman, & Wang, 1995, p. 6).

Yet another instrument was developed by Shouse (1996), who examined the tension between a school that stresses social cohesion, or community, and a school that stresses academic press in the *National Educational Longitudinal Study: 1988*. The author argued that these ideas are not necessarily incongruous, but they are often at odds.

Shouse measured academic press by combining 28 indicators of academic climate, disciplinary climate, and teachers' instructional practices and emphases. The construct was a mix of principal, teacher, and student survey responses. To analyze the two constructs, Shouse put them both in a single HLM model with tenth grade math achievement as an outcome. He also included interaction terms in the model to investigate how academic press and communality associate with student achievement differentially across levels of school socioeconomic status. The analysis showed that academic press had a significant and positive effect on achievement, and in addition, a significant interaction term seemed to indicate that academic press had a stronger effect in low-SES schools.

Other studies moved beyond achievement and investigated conventional academic press's association with other outcomes. Leblanc and colleagues (2007) measured academic press by combining eighteen indicators of evaluation processes in schools including assignment of homework, checking of homework, academic requirements, and time allotted for corrections, routine tasks, and teaching activities. The authors did not list all of the specific indicators, but it appears as if no indicators of belief were included in the measure. The multilevel results from this study of 107 high schools showed that as the level academic press increased in the school, the rate of student behavior problems tended to drop.

Byrk and Thum (1989) found that at-risk youths were less likely to drop out if they attended a school characterized by high levels of this aspect of school culture. They measured conventional academic press by combining measures of the number of hours per week on homework, students' attitudes towards getting good grades, student's

interest in school, student's report about the lack of academic press in the school, and school average scores from academic pursuits. This research employed HLM techniques on a subsample of 160 schools and 4450 students from the *High School & Beyond* dataset. McNeal (1997) also used the *High School & Beyond* data to investigate the relationship between academic press and the probability that a student would drop out. However, he found a different result than Bryk and Thum. His measure of academic press, which came from a factor analysis of hours per week of homework, number of advanced placement classes offered, percent of teachers with advanced degrees, requirement of a competency test for teachers, and the number of college counselors, was not associated with the probability of a student dropping out. The difference in results is most likely attributable to the different ways in which the researchers measured academic press. Bryk and Thum included more measures of attitudes and beliefs while McNeal's measure focused on policy and practice indicators of the academic climate of the school. Regardless, neither of the results indicated that a high level of academic press in a school increased the likelihood that students will drop out.

These studies, as well as the research from the Effective Schools movement and the research that employed the Organizational Health Inventory, demonstrated that conventional academic press was linked to student achievement as well as other important outcomes such as the odds that a student drops out of school and student disciplinary issues. The researchers measured academic press in a variety of ways including the use of homework procedures, teacher characteristics, student course enrollment, student beliefs, and teacher beliefs. Yet, none of the conventional academic press measures were comprised solely of teachers' assessments of teacher beliefs. The

studies that employed the OHI mixed teachers' assessment about their own beliefs with assessments of students' beliefs. However, Murphy et al. (1982) placed the belief structures of teachers and students at different ends of the their academic press framework (Figure 2.1). It is not clear in these pieces if the student belief structures or the teacher belief structures are having the effect on student achievement or are the authors correct in the way that they have combined them. Furthermore, the articles that did not use the OHI in their operationalization tended to combine teacher belief structures with any number of measures of classroom practices, school policies, and students' beliefs. Again, these areas are all distinct in the Murphy et al. framework. In none of these studies did researchers examine teacher belief structures around academic press independent of policies, practices, or students' beliefs. Consequently, studies of conventional academic press have never seemed to explore how teacher belief structures around academic press, independent of these other areas, are associated with student achievement. It is here that teacher's academic press can contribute to the research literature.

### Teacher's Academic Press

The studies reviewed above dealt with conventional academic press, but recently, some researchers have moved beyond the traditional definition and operationalizations for measuring academic press. Scheerens and Bosker (1997) put forth a more focused definition of academic press that dealt solely with a mastery learning orientation and high expectations for all students. A small handful of researchers then proceeded to take this definition and include it in analyses of leadership and other school level measures

(McRel, 2005; Goldring, et al., 2008). The constructs used in these studies were comprised solely of teachers' perceptions of their collective beliefs. None of the studies in the conventional academic press literature base measured the construct in such a way. Though the authors in these new studies referred to their measures as academic press, I believe that it will help to clarify the difference by giving this construct a new title: teacher's academic press (TAP). TAP is thus defined as the extent to which teachers in a school collectively hold a mastery learning orientation and have high expectations for all students. Before discussing this research, I present a brief discussion of the two main principles inherent in the TAP definition.

#### Mastery Learning Orientation

The idea of mastery learning emerges out of Achievement Goal Theory, which is based on learning orientation work in the mid 1980s (Ames, 1984; Nicholls, 1984; Dweck, 1986). A mastery learning orientation puts the focus on the task at hand and personal improvement, as opposed to a performance learning orientation, which centers upon competition against others. The vast majority of prior studies on learning orientations have focused on the perceptions of students about themselves or their teachers. This research has demonstrated that a student's learning orientation is associated with a number of outcomes including achievement, motivation, help-seeking behavior, and resilience (Elliot & Harackiewicz, 1996; Harackiewicz, Barron, & Elliot, 1998; Karabenick, 2004). Other studies have looked at student's perceptions of the learning orientation of their teacher, and this research has again found many of the same relationships (Ryan, Gheen, & Midgley, 1998; Kaplan, Gheen, & Midgley, 2002).

However, Urdan (2004) argued that in these instances, student assessment of the classroom's learning orientation is skewed by their personal orientation. A small number of articles have examined the learning orientation of a classroom from the perspective of the teacher, but these studies have failed to find any significant linkages between a mastery orientation and student outcomes (Ryan et al., 1998; Kaplan, Gheen, & Midgley, 2002). This research, however, fails to take into account that the organizational context of the school may have a measurable impact. Leahy (2007) found that schools, and not just individual teachers, could hold an organizational teaching orientation. For example, in a school with a high degree of mastery orientation, teachers focus on the individual effort and improvement of students and not just whether or not the students perform adequately on assessments.

#### High Expectations for All

The expectations that teachers have of their students' abilities have been repeatedly shown to be associated with student's actual performance (Hinnant, O'Brien, & Ghazarian, 2009, Feinberg, 2009). For example, Teddlie and Stringfield (1985) used survey data from the Louisiana School Effectiveness Study to examine differences among middle and low-income schools characterized by differing levels of achievement. They found that in both middle and low SES schools, teacher expectations were positively correlated with the achievement level of the school. However, teachers' assessments are not always accurate, and self-fulfilling prophecies may be the mechanism through which students achieve at the levels expected of them instead of the levels to which they are capable (for a full literature review of expectations and self-fulfilling

prophecies, see Jussim & Harber, 2005). Prior research has indicated that teachers' expectations can be biased by students' race, gender, ethnicity and native language (Holliday, 1985; Sirota & Bailey, 2009; Washington, 1982). This expectation bias, termed deficit thinking, is often rationalized through the belief that students who fail do so because of internal shortcomings, and that "[s]uch deficits manifest, it is alleged, in limited intellectual abilities, linguistic shortcomings, lack of motivation to learn and immoral behavior" (Valencia, 1997, p. 2). Researchers have thus argued that teachers need to maintain high academic expectations for *all* students, regardless of race, gender, ethnicity, or any other demographic characteristic.

A mastery orientation and high expectations define TAP, and these constructs contributed strongly to the ways in which both McRel (2005) and Goldring and colleagues (2008) measured TAP. McRel (2005) employed Marzano's (2000) work to define TAP as a clear focus on mastery learning, high expectations for all students, and a school wide emphasis on high achievement. In a study of 76 high-needs elementary schools (49 high-performing and 27 low-performing schools), they combined eight survey items to assess TAP, and the scores from the study had a reliability (alpha coefficient) of 0.84.

1. The primary mission of my school was that all students became proficient in core subjects.
2. Teachers in my school emphasized that student performance could always be improved.
3. My school supported all teachers in their efforts to improve student achievement.

4. All teachers in my school believed that students could reach standards and objectives.
5. My school set ambitious goals for student achievement.
6. Our faculty valued school improvement.
7. Our teachers assumed responsibility for ensuring that all students learned.
8. My school had an explicit statement of high expectations concerning student achievement.

The researchers examined four areas: instruction, school environment, professional community, and leadership. TAP was considered one of the four components of the school environment (the other three components were parent involvement, orderly climate, and assessment and monitoring), which dealt with school-level effects that cannot be ascribed to a particular object or person (e.g. teachers, principals, curriculum). The authors investigated how the four areas interacted through the use of structural equation modeling and multilevel modeling. They hypothesized that the interactions between the areas would be different in high and low performing schools. Factor analysis was used to combine academic press for achievement with the other areas in school environment. Results showed that high performing schools had a much stronger school environment than the low performing schools. In addition, school environment was linked to instruction and leadership, although the effects seemed similar in the low and high performing schools.

Goldring, Huff, May, and Camburn (2008) published the only other empirical article that contained TAP. This work emerged out of a study of the National Institute for

School Leadership and contained data from 29 elementary schools, nine middle schools, four high schools, and four alternative/special education schools. All of the schools were from a single, urban district. In this analysis, the authors sought to classify principals via the ways in which they spent their time and to understand how characteristics of the school context, such as TAP, influenced classification.

They defined their version of academic press as, “the extent to which teachers focus on academic excellence and the professional and academic standards in the school support student learning” (Goldring, et al., 2008, p. 341). Their version of TAP consisted of four survey items given to teachers.

1. Teachers in this school expect students to complete every assignment.
2. Teachers in this school encourage students to keep trying even when the work is challenging.
3. Teachers in this school set high expectations for academic work.
4. Teachers in this school think it’s important that all students do well in their classes.

Using cluster and discriminant analyses, the authors found that the level of TAP was an important factor in distinguishing principals based on their practice. Specifically, the level of TAP was higher in schools where the principal distributed their work evenly across many realms including instructional, managerial, and student affairs.

These two studies demonstrated the promise of TAP by providing meaningful associations between the construct and other important measures. Conceptually and operationally, TAP presents a new way of looking at conventional academic press. Previous studies of academic press have encompassed everything from norms to

expectations to classroom practices to policies, and TAP represents a more focused definition of a school based on collective teacher beliefs around mastery learning orientation and high expectations for all students. Only the two empirical studies reviewed above (Goldring, et al., 2008; McRel, 2005) specifically employed TAP, but that does not mean that similar constructs to TAP have not appeared in the literature. Below, I discuss a recent construct, collective focus on student learning, that bears a striking resemblance to TAP.

#### Collective Focus on Student Learning: A Related Construct

A construct similar to TAP appears as a central component of the professional learning community (PLC) framework: collective focus on student learning (Kruse, Louis, & Bryk, 1995). The literature base does not specifically link TAP and collective focus on student learning, but by examining the definition of collective focus on student learning and the ways it has been measured, parallels between the two constructs emerge. Kruse, Louis, and Bryk (1995) defined collective focus on student learning as “teachers’ beliefs and values must wholeheartedly support notions of children as academically capable, and provide learning environments responsive to and supportive of student achievement” (p. 32). When a school has a high collective focus on student learning, teachers embrace the goal of maximizing students’ potential (Hord, 1997), and the school focuses its energies on improving student learning while ensuring that all actions and decisions, not solely those directly related to pedagogy, seriously consider the potential benefits and costs to students (Abbott, 1991; Darling-Hammond & Goodwin, 1993; Darling-Hammond & Snyder, 1992; Little, 1990). This collective vision provides

teachers with “a set of principles by which they can take collective action and evaluate their progress in the classroom and as a team” (Brownell, Yeager, Rennells, & Riley, 1997, p. 344).

Kruse, Louis, and Bryk (1995) theorized that for a school to maintain a collective focus on student learning, teachers align their beliefs and values to the vision that all children can achieve academically and, in doing so, produce a learning environment that fosters student achievement for all. If the faculty collectively believes that all students can learn, then the central mission of that school should be to promote high achievement for all children (Bryk, Camburn, & Louis, 1999). The unified mission is the first step in developing a technical core centered on a common language around teaching and instruction, as well as a common core of knowledge about curriculum and practice (Brownell, Yeager, Rennells, & Riley, 1997; Englert & Tarrant, 1995). Furthermore, a school characterized by a high level of collective focus on student learning will often develop patterns of effective collaboration that will make teachers more apt to accept innovative practices from their peers (Brownell, Yeager, Rennells, & Riley, 1997; Nias, Southworth, & Yeomans, 1989). Inherent in all of this is that teachers hold high expectations for all students, which is a central component of teacher’s academic press. Mastery learning is not explicitly mentioned in this specific literature, but the survey items that the authors have used to measure the collective focus on student learning do take this into account.

In reviewing the literature on collective focus on student learning and professional learning communities, multiple scales were used to measure collective focus on student learning. Four of the most prominent scales are listed in Table 2.1. The scales

developed by the Consortium for Chicago School Research and Bryk, Camburn, and Louis (1999) were the same save for one item. High expectations were represented in the following items: “This school has well-defined learning expectations for all students,” “This school sets high standard for academic performance,” and “How many teachers in this school feel responsible that all students learn?” While not apparent in the Consortium and Bryk, Camburn, and Louis scales, Louis, Marks, and Kruse (1996) asked questions that dealt with mastery learning, such as how important higher level skills (reasoning, problem solving, critical, and creative thinking) were to a teacher’s goals for his or her students, whether “[t]eachers exhibit a reasonably focused commitment to authentic curriculum and instruction,” and to what extent “[t]eachers focus on what and how well students are learning rather than how they are teaching.” Authentic curriculum and instruction is based on the notion of authentic achievement and refers to pedagogy that is based on construction of knowledge, disciplined inquiry, and finding value beyond school (for a full discussion of authentic curriculum, instruction, and achievement, see Wehlage, Newmann, & Secada, 1996). Finally, the Nilsen (1997) scale, which overlapped considerably with Louis, Marks, and Kruse, posed an additional item dealing with mastery learning, “Creative thinking is an important student goal for our district's students.” Taken together these scales focus on both mastery learning and high expectations for all students.

Table 2.1

Collective Focus on Student Learning Survey Scales

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Consortium for Chicago School Research (2000)	Bryk, Camburn, & Louis (1999)	Louis, Marks, & Kruse (1996)	Nilsen (1997)
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This school really works at developing students' social skills.	How many teachers in this school feel responsible that all students learn?	[Importance to your teaching as a goal for your students]. Higher level skills (reasoning, problem solving, critical, and creative thinking). Teachers focus on what and how well students are learning rather than how they are teaching.	Higher level skills (reasoning, problem solving, critical thinking) are important student goals of our district's students. Teachers in our district focus on what and how well students are learning rather than on how they are teaching.
When making important decisions, the school always focuses on what's best for student learning. This school has well-defined learning expectations for all students.	When making important decisions, the school always focuses on what's best for student learning. This school has well-defined expectations for all students.	Teachers exhibit a reasonably focused commitment to authentic curriculum and instruction.	Teachers in our district exhibit a reasonably focused commitment to authentic instruction.
This school sets high standards for academic performance.	This school sets high standard for academic performance.	A focused school vision for student learning is shared by most staff in the school.	A focused school vision for student learning is shared by most staff in the schools in our district.
The school day is organized to maximize instructional time.	The school day is organized to maximize instructional time.		Teachers in our district exhibit a reasonably focused commitment to authentic assessment. Creative thinking is an important student goal for our district's students.

Unfortunately, collective focus on student learning has not been examined independently of the PLC framework; there is no research that directly links it to any other measures in schools. However, the literature base on professional learning communities can provide some insights into different measures that might link to collective focus on student learning. The level of PLC in a school has been linked to

organizational learning (Bryk, Camburn, & Louis, 1999), collective responsibility (Louis, Marks, & Kruse, 1996), and innovation (McLaughlin & Talbert, 1993). With regard to achievement, the empirical research tended to be mixed. Lee, Smith, and Croninger (1996) found that schools characterized by a higher level of PLC tended to have higher achievement, but a McRel (2005) report found no difference in the level of PLC between high and low performing schools.

The definitions that PLC researchers have employed for collective focus on student learning and the survey scales presented above show many similarities to the framework for teacher's academic press. This research demonstrates that a construct similar to TAP is being discussed in a literature outside of the academic press literature, which strengthens the argument that TAP is a distinct construct. Furthermore, the PLC literature provides potential correlates for TAP such as innovation and reflective dialogue that can be used in research about TAP. However, TAP and collective focus on student learning have not been empirically compared in any published piece, and any comparisons at this time are based on the review of the literature.

### Rationale for Hypothesis

My review of the literature documents the emergence of the construct of TAP. Researchers have been studying academic press for over 30 years, but authors have employed so many varied definitions that the construct has become somewhat muddled. TAP is distinct from conventional measures of academic press in that it employs a more focused definition comprised of high expectations for all students and a mastery learning orientation. These ideas appear in many pieces about conventional academic press, but

they were rarely examined independent of other constructs. In addition, TAP is operationalized solely by teachers' assessments of collective teacher beliefs, which is not done in the conventional academic press research. This is important as the Murphy et al. framework (1982) shows that teacher belief structures are separate from classroom practices and school policies, which were often combined in measures of conventional academic press. Teacher belief structures are part of the cultural subsystem in the social system model, but policies and practices fall into other areas of the social system such as the individual and structural subsystems (Hoy & Miskel, 2001). By focusing specifically on collective teacher beliefs, TAP is placed squarely in the school culture whereas conventional academic press tended to include aspects of other subsystems.

A few studies have examined how TAP is connected to leadership (Goldring, et al., 2008; McRel, 2005) and instruction (McRel, 2005). In addition, TAP appears to be similar to the construct of collective focus on student learning that is a central component of professional learning communities (Kruse, Louis, & Bryk, 1995). As a part of PLCs, collective focus has been linked to organizational learning (Bryk, Camburn, & Louis, 1999), collective responsibility (Louis, Marks, & Kruse, 1996), and innovation (McLaughlin & Talbert, 1993). In addition, student achievement has been found, in some cases, to be linked to PLCs (Lee, Smith, & Croninger, 1996). Furthermore, traditional measures of academic press have been repeatedly linked to achievement (e.g. Smith, 2002; Goddard, Sweetland, & Hoy, 2000; Lee, Smith, Perry, & Smylie, 1999). However, no previous research has attempted to link TAP with student achievement.

TAP is a relatively new construct that does not have a long history of measurement. Consequently, there are no well-established survey scales that assess

teachers' collective beliefs about mastery learning and high expectations for all students.

In this dissertation, I propose a new survey scale for TAP that employs established survey items. With any new scale, it is important to establish validity and reliability. Therefore, I propose the following research question.

Research Question 1: Does the survey scale used in this study validly measure Teacher's Academic Press and are the scores reliable?

In addition, no previous empirical work has investigated whether a measure of teacher's academic press has a direct association with student achievement. TAP, as an aspect of the cultural subsystem of a school, has the potential to explain why some large-scale school reform models, such as Reading First, have mixed effects on student performance. Given that the research literature consistently shows that conventional academic press has a positive relationship with achievement, I propose a hypothesis in which TAP is positively related to achievement. To that end, I ask the second research question below.

Research Question 2: Does the level of Teacher's Academic Press in an elementary school have a significantly positive association with student achievement in reading comprehension when controlling for demographic characteristics and other school-level measures?

## Chapter 3

### Method

In this chapter, I discuss the method used to address my research questions. In the first section, I review the data sample through an exploration of Reading First in Michigan and the schools, teachers, and students that participated in the program. In the next section, I describe student-level measures, focusing specifically on the assessment of student achievement in reading comprehension. A discussion of classroom- and school-level measures follows, including a thorough description of the survey scale for teacher's academic press (TAP). In the closing section, I detail the analytic methods employed, including the multiple imputation procedures used to compensate for missing data and the multilevel modeling used to investigate the research questions.

#### Sample

Michigan's Reading First (RF) schools provide an excellent opportunity to study the relationship between TAP and student achievement. Legislators from the state of Michigan made clear in their grant application for RF that ensuring mastery learning for all students was a priority: "Reading First provides an opportunity for eligible districts to implement reading programs that help all students achieve reading mastery by the end of third grade" (State of Michigan, 2002, p. 15). Policymakers enacted the RF program as part of the *No Child Left Behind Act of 2001* in order to provide funding to states that

would be used to improve early reading achievement for children in high poverty and chronically underachieving schools (U. S. Department of Education, 2002). Michigan's grant application for RF funds stated, "Michigan's Reading First plan... is designed to ensure that all children learn to read well by the end of third grade" (State of Michigan, 2002, p. 1). Specifically, the program worked to improve students' ability in five key areas: phonemic awareness, systematic phonics, vocabulary, oral reading fluency, and reading comprehension. Monies were used to improve and support teachers' capacity for teaching reading effectively; specific measures included purchasing reading programs, materials, and assessments supported by research; providing professional development for teachers and administrators; and hiring a literacy coach to support teachers in their efforts to improve students' reading achievement. The state selected districts to participate based on two eligibility criteria: the number of students reading below grade level and the number of students living in poverty. Michigan began implementing the RF program in the 2002-2003 school year, and the program lasted six years.<sup>4</sup>

All states participating in the RF program were required to have an independent evaluator, and for Michigan, that evaluator was Joanne Carlisle from the University of Michigan. The evaluation study in Michigan focused on factors that affected implementation of the RF program and student progress in reading achievement in kindergarten through third grades. I served as a research assistant on the evaluation and helped to develop the survey scales that were used to assess teacher beliefs. All of the data used in this dissertation came from the evaluation study in the final year of the program, 2007-2008.

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<sup>4</sup> For a subset of schools deemed sufficiently successful by the state's RF directors, the state provided a seventh year of funding.

All schools in Michigan participating in RF in the 2007-2008 school year were included in this study—specifically, 157 schools were implementing RF in that year. These schools were in districts characterized by high levels of poverty and historically low levels of reading achievement, based on eligibility criteria established by the state as required by the RF guidelines. School-level descriptives can be found in Table 3.1. High levels of poverty characterized many of the RF schools; the average percentage of free and reduced price lunch (FRL) students was 78%. In addition, the standard deviation (18%) indicates that there was variance in the amount of FRL students in the schools. The variance was highest with the percent of minority (non-white, non-Asian) students (36%). This is not uncommon in Michigan. Minority students are concentrated in a small number of large urban districts (e.g. Detroit, Flint), while the rest of the state tends to identify as predominantly white. On average, schools in the sample had 10% limited English proficient (LEP) students and 12% special education students. As expected, schools tended to be split evenly between male and female students.

Table 3.1

School-level Descriptives (n = 157)

	Mean	SD
Avg. % FRL	78%	18%
Avg. % Minority	63%	36%
Avg. % LEP	10%	17%
Avg. % Special Education	12%	4%
Avg. % Female	49%	3%

The RF program in each school included kindergarten through third grade, and all teachers in these grades participated in the program. In addition to participating in professional development activities, administering assessments, and more, teachers completed surveys three times during the year (fall, winter, and spring) as part of the evaluation study. The surveys were designed to gather teachers' views on a plethora of areas, including school climate, self-report of practice, and knowledge of reading content. Over the 2007-2008 school year, a total of 1,841 teachers participated in these surveys; however, because teachers skipped questions, did not code responses correctly, or left the school during the year, missing data constituted a particular problem in analysis of survey results. The missing data problem will be addressed below.

The teachers in these schools were overwhelmingly female (93.4%) and identified racially as white (75.3%). The majority of racial minority teachers were Black (65%), and the rest were comprised of Hispanic (17%), multiracial (7%), and others. Nearly two-thirds indicated that they had obtained a Master's degree (64.8%), with the most common degree specializations in elementary education and reading/literacy. The average number of years of teaching experience was 15.1 years (standard deviation of 9.7), with a range from 0 to 51 years. The sample was well balanced across the four grades with each grade having roughly a quarter of the surveyed teachers. Importantly, 20% of the teachers in the sample were new to their school, which is not surprising given that previous research has noted that teacher turnover tends to be more of a problem in high poverty schools (Ingersoll, 2004).

Table 3.2

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Teacher Descriptives (n = 1,841)		
	Percent/Mean	SD
Female	93.4%	--
Minority	24.7%	--
Masters	64.8%	--
New to School	20.0%	--
Years Experience	15.1	9.7

The average student demographic characteristics of the classrooms were quite similar to those of the school. The average classroom had 77% of students eligible for FRL and 62% of students identified as a racial minority. Again, the standard deviations of both variables indicate that classrooms varied widely in both areas. On average, classrooms had 12% LEP, 15% special education, and 48% female students.

Table 3.3

Classroom-level Descriptives (n = 1,684)		
	Mean	SD
Avg. % FRL	77%	21%
Avg. % Minority	62%	37%
Avg. % LEP	12%	23%
Avg. % Special Education	15%	22%
Avg. % Female	48%	14%

Students in first, second, and third grade completed the Iowa Test of Basic Skills (ITBS) assessment battery at the end of the school year. For this study, I restricted the sample to students in second and third grade because the second and third graders had not only a current reading comprehension achievement score but also a reading comprehension achievement score from the previous year. While 8,642 second graders and 8,381 third graders were present in the 157 schools and had current achievement measures, only 6,664 second graders and 6,525 third graders had scores from the prior year. I restricted my sample to only those students with prior achievement to ensure the strongest possible model, as prior achievement is a strong predictor of current achievement (for a list of studies see Marzano, 2000, p.70).

The students without prior achievement measures were not enrolled in a Michigan RF school in that district the previous year. The data collection system tracked mobile students as long as they remained in the same district but not if they moved from one district to another. I investigated whether students with reading comprehension scores from the prior year were different than those without a score from the prior year. Chi-square analyses indicated that in both grades, students without prior achievement scores were more likely to be eligible for FRL and be a racial/ethnic minority (non-white or non-Asian). Additionally, second graders that were missing prior achievement were less likely to be designated as LEP. Given these differences and to ensure that the exclusion of these students did not alter my results, I ran my achievement model both with the full sample (and no prior achievement control) and with the restricted sample. The models were quite similar, and so I only present the more rigorous model with the prior achievement control. A small percentage of students were also missing descriptive data

and were therefore removed from all analyses. The final analytic sample was 6,205 second graders and 6,112 third graders.

As part of the evaluation study, demographic information on students was collected from Michigan’s Single Record Student Database. In the analysis, I included dichotomous measures of gender, whether or not a student was eligible for FRL (a proxy for socioeconomic status), whether or not a student was a racial or ethnic minority (non-white or non-Asian), whether or not a student was designated as LEP,<sup>5</sup> and whether or not a student was designated as special education. Descriptive statistics are given in Table 3.4. There were very few differences between the grades in terms of student demographics. The percent of FRL students, the percent of minority students, and the percent of female students were nearly identical. Fewer students in third grade were considered LEP, and the percent of students designated as special education was greater in third grade than in second grade.

Table 3.4

Student-level Descriptives

	Second Grade (n = 6,205)	Third Grade (n = 6,112)
FRL	76%	76%
Minority (non-white, non-Asian)	56%	57%
LEP	15%	11%
Special Education	10%	13%
Female	50%	49%

<sup>5</sup> The term limited English proficient was used by the state of Michigan, and it is thus the term I use in this research.

Mean Reading Comprehension 2008 (standard deviation)	168.94 (19.09)	179.88 (20.88)
Mean Reading Comprehension 2007 (standard deviation)	150.40 (12.71)	167.70 (18.19)

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### Student Achievement

At the end of each school year, first, second, and third grade students in the Reading First schools took the Iowa Test of Basic Skills (ITBS). Though the norm referenced assessment contained a number of reading subtests, I chose to focus specifically on reading comprehension, which was one of the five specific components of literacy in the Reading First program (State of Michigan, 2002). In addition, reading comprehension is a central goal of reading instruction in the early elementary years. The comprehension subtest asks students to employ critical thinking in answering questions about text passages. Questions deal with factual understanding (understand stated information and understand words in context), inference and interpretation (draw conclusions; infer traits, feelings, or motives of characters; interpret information in new contexts; and interpret nonliteral language), and analysis and generalization (determine main ideas, identify author's purpose or viewpoint, and analyze style or structure of a passage). Scores were standardized based on a public school sample stratified by geographic region, district enrollment, and school socioeconomic status. More information about the standardization process can be found in ITBS Guide to Research and Development (Hoover et al., 2003). Achievement descriptives, shown in Table 3.4, indicate that second graders finished the 2007-2008 school year with an average score of just less than 169 points with an average prior achievement score of 150.40. On the other hand, third graders finished the current year with an average standardized score of 179.88

and previous year's achievement of 167.70. Standard deviations for the 2008 scores in both grades were around twenty points indicating that roughly two-thirds of students fell within a forty point range around the means.

### Classroom and School Measures

In this section, I review the classroom and school level measures included in my analysis. I begin by discussing the TAP scale used in this study and the methods used to establish validity and reliability for the scale (research question one). The next section provides information about classroom- and school-level covariates used in the analyses, such as aggregated student demographics and other school-level measures.

#### Teacher's Academic Press

Two previous studies used different scales to measure TAP: Goldring et al. (2008) and McRel (2005). In constructing the scale used in this study (see Table 3.5), I incorporated three of the four items used by Goldring and colleagues. Unfortunately, the McRel items were not published in the report, and I was unable to obtain them in time for the survey administration. The eight items used in this study are listed below, and I compare the three scales in the discussion chapter. Teachers responded to these items on an eight point Likert scale, which asked, "To what extent do you agree with the following statements?" on a scale from "Not at all" to "Completely." Item responses were aggregated to the school-level, and principal components analysis was then used to conduct an exploratory factor analysis.

Table 3.5

Teacher's Academic Press Survey Items		
Item	Dimension	Origin
1. When making important decisions, the school always focuses on what's best for student learning.	High Expectations for All	Consortium for Chicago School Research-Focus on Student Learning Scale
2. This school has high expectations for our students' achievement.	High Expectations for All	Goldring, et al.-Academic Press Scale & Consortium for Chicago School Research-Focus on Student Learning Scale
3. Teachers in this school think it's important that all students do well in their class.	High Expectations for All	Goldring, et al.-Academic Press Scale & Consortium for Chicago School Research-Focus on Student Learning Scale
4. Teachers in this school encourage students to keep trying even when the work is challenging.	Mastery Orientation	Goldring, et al.-Academic Press Scale
5. Students at this school are expected to master the content they are working on before moving to new topics.	Mastery Orientation	Study for Instructional Improvement
6. Teachers in this school stress the importance of "trying hard" to the students.	Mastery Orientation	Leahy's adapted Patterns of Adaptive Learning Survey
7. Teachers in this school let students know that making mistakes is OK as long as they are learning and improving.	Mastery Orientation	Leahy's adapted Patterns of Adaptive Learning Survey
8. Teachers in this school place an emphasis on really understanding schoolwork, not just memorizing it.	Mastery Orientation	Leahy's adapted Patterns of Adaptive Learning Survey

My first research question deals with establishing the validity of the new scale and the reliability of the scores. These theoretical and technical properties are important to ensure sound interpretation of the results. To address the first research question, I investigated three types of validity: evidence based on internal structure, evidence based

on questionnaire content, and evidence based on relations to other variables. All of these areas of validity come from the Standards for Educational and Psychological Testing (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999). Evidence based on internal structure deals with the way that the individual items of the scale interact. Do the items load on a single construct or multiple dimensions? If the scale has one or more clear dimensions, then the items should conform to the theoretical framework. I hypothesized that the eight items would load on a single factor, even though the constructs have different dimensions (mastery learning and high expectations). I employed an exploratory factor analysis to see if the items all load on a single factor or multiple factors.

Evidence based on relation to other variables focuses on the connections the scale has to other measures based on prior theoretical and empirical work. As TAP has not been studied extensively, there are few established connections between the construct and other school-level indicators. The Goldring et al. (2008) study used TAP as a covariate in their study of principals, but they did not directly look at TAP's relationship to anything besides the behavior of the principal in each school. The McRel (2005) study did associate TAP with other measures, but given that the authors did not publish their survey scales, it was difficult to use this research as a guide. One measure included in the McRel study was the quality of professional development perceived by the faculty; however, the relationship between the two constructs was not directly examined as the authors tested the relationship between school environment and professional community, which contained TAP and quality of professional development respectively. The authors

did not find a significant relationship between the two larger measures, and therefore while I hypothesize that TAP and the quality of professional development are positively related, the association may not be very strong. Accordingly, I correlated it with a measure of teacher's assessment of the quality of professional development taken from the Consortium for Chicago School Research's 1999 teacher survey (2000). Given the similarity between TAP and collective focus on student learning, it is possible that constructs that have been empirically linked to PLCs might also be associated with the level of TAP in a school. Multiple studies have linked reflective dialogue to collective focus on student learning in the PLC framework (Kruse, Louis, & Bryk, 1995; Bryk, Camburn, & Louis, 1999; Louis, Marks, & Kruse, 1996). Given the number of studies to link these two constructs, I expect them to have a strong, positive relationship. The PLC literature has also demonstrated that collective focus on student learning is connected to teacher-teacher trust. Bryk and Schneider (2002) found that the level of teacher-teacher trust in a school positively and significantly predicted change in the level of professional community, of which collective focus on student learning was an aspect, in a school. Finally, McLaughlin & Talbert (1993) posited that PLCs support innovation and risk-taking, and the degree of innovation in a school was also discussed by Hoy and Miskel (2001) as one of the common elements of a cultural system, and because TAP is also a facet of the cultural subsystem in a school, the two constructs are most likely related. The definitions and scales used to measure quality professional development, teacher-teacher trust, reflective dialogue, and innovation are discussed below. In addition, I wanted to ensure that the TAP scale had discriminant validity. In other words, I wanted to make sure that TAP was distinct from previously established scales (Shadish, Cook, &

Campbell, 2002). To investigate this, I ran a factor analysis with 34 survey items that included the 8 TAP items and the scales for teacher-teacher trust, innovation, quality professional development, and reflective dialogue.

Evidence based on questionnaire content, which the standards refer to as evidence based on test content, centers around the themes, wording, and format of the items. Simply, do the items ask what they are meant to ask? I establish this validity by showing how the items map onto the two dimensions of TAP, high expectations for all students and mastery learning, through their wording and the historical roots of each item.

Finally, I investigated reliability of scores on the TAP scale, which refers to the consistency of scale scores. I computed the Cronbach's alpha, a measure of internal consistency, for scores on the eight TAP items. This statistic assesses the internal reliability of item scores by measuring their intercorrelations.

#### Classroom and School Controls

In constructing the achievement model, I included a number of classroom- and school-level controls. First, I aggregated the student descriptives to obtain the percentage of female students, FRL students, LEP students, minority students, and special education students at both the classroom and school-levels. At the classroom-level, I included a measure for whether or not the teacher was new to the school. It is possible that new teachers might not experience the culture in the same way as other teachers and this could affect how TAP relates to achievement. School-level averages of both second and third grade student performance on the ITBS reading comprehension subtest were also correlated with TAP.

As mentioned above, I examined TAP in relation to measures of the quality of professional development, teacher-teacher trust, reflective dialogue, and innovation. The survey scales for all four of these constructs were taken from the Consortium on Chicago School Research teacher survey (2000). Some items were taken directly from the Consortium, while others were adapted slightly to reflect the context of Reading First and focus on issues of reading instruction. All item responses were aggregated and factor analyzed using principal components analysis.

The quality of professional development addresses issues related to whether the teacher's professional development influenced instruction, provided opportunities for collaborative work, and helped teachers to better understand their students. The nine Likert items, which are listed below, all had the same stem, "Overall, the professional development I have received as part of Reading First has:"

1. Included opportunities to work productively with teachers from other schools.
2. Provided enough time to think carefully about and try out new ideas/methods.
3. Deepened my understanding of reading and writing.
4. Helped me to better understand my students' reading problems.
5. Been sustained and coherently focused rather than short term and unrelated.
6. Included opportunities to work productively with colleagues in my school.
7. Led me to make changes in my teaching of reading.
8. Been closely connected to my school's improvement plan.
9. Helped me to address the literacy needs of students in my classroom.

Measures of trust are based on five dimensions: openness, competence, honesty, reliability, and benevolence (Hoy & Tschannen-Moran, 1999). Trust among teachers is important in schools, as “relational trust within a faculty is grounded in common understandings about such matters as what students should learn, how instruction should be conducted, and how teachers and students should behave” (Bryk & Schneider, 2002, p. 30). The six teacher-teacher trust items are as follows.

1. It’s OK in this school to discuss feelings, worries, and frustrations with other teachers.
2. Teachers at this school respect colleagues who are expert in their craft.
3. Teachers in this school trust each other.
4. Teachers in this school really care about each other.
5. Teachers respect other teachers who take the lead in school improvement efforts.
6. I feel accepted and respected as a colleague by most staff members.

Along with collective focus on student learning, reflective dialogue is one of the central components of a professional learning community (Kruse, Louis, & Bryk, 1995). Reflective dialogue deals with communication around teaching and learning that flows in all directions equally (Galvin, 1998) and is centered on issues of “practice, values, instructional methods, and conceptions of learning” (Evans-Stout, 1998, p. 131). I list the seven reflective dialogue survey items below.

1. Teachers in this school regularly discuss assumptions about teaching and learning.

2. Teachers in this school share and discuss student work with other teachers.
3. Teachers talk about instruction in the teachers' lounge and at faculty meetings.
4. This school year, how often have you had conversations with colleagues about the goals of this school?
5. This school year, how often have you had conversations with colleagues about development of new curriculum?
6. This school year, how often have you had conversations with colleagues about managing classroom behavior?
7. This school year, how often have you had conversations with colleagues about what best helps students improve their reading and writing?

The construct of innovation deals with the ways in which teachers are continually improving and learning (The Consortium on Chicago School Research, 2000). Hoy and Miskel (2001) define it as, “the degree to which employees are expected to be creative and take risks” (p. 183). The first two items of the scale ask teachers to assess collective teacher behaviors, and the second two items ask teachers to rate how many teachers in the school are willing to take risks and try new ideas, which are all listed below.

1. In this school, teachers are continually learning and seeking new ideas.
2. Teachers in this school are eager to try new teaching methods.
3. How many teachers at this school are willing to take risks to make this school better?
4. How many teachers at this school are eager to try new teaching ideas in their classrooms?

### Analysis of Missing Data

Of the 1,841 teachers, 160 (8.7%) did not have responses for all eight TAP questions. Additionally, seven of the eight items had an additional three (0.1%) to thirteen (0.7%) missing cases. To ensure full representation of all teachers, I employed multiple imputation to estimate the missing cases. Using a multivariate normal model, I imputed values for the missing cases on the eight questions using all other variables from survey datasets and classroom demographics as covariates in the process. Five imputed datasets were produced, but I could not use the estimation features of the imputation program, as factor analysis is not a supported function. Analyses that used only one of the imputed datasets and those that combined all five datasets yielded similar results (for a discussion of this comparison, see Appendix). Therefore, I randomly chose one imputed dataset to use in all further analyses.

### Analysis of Achievement Model

To address my second research question that the level of TAP in a school has a significantly positive relationship with student achievement in reading comprehension, I employed Hierarchical Linear Modeling (HLM). HLM was most appropriate, given the multilevel nature of the research question and data, as HLM allows for the partition and modeling of variance at multiple levels. I constructed a 3-level model with students nested in classrooms, which were nested in schools. The 3-level model parsed the outcome variance to each level and facilitated examination of effects at all three levels. In addition, separate models were run for each grade to investigate whether TAP had

different effects on reading comprehension achievement in second and third grades. The outcome was the spring 2008 ITBS Reading Comprehension standardized score. I chose to do a one-tailed hypothesis test in this analysis given that conventional academic press has been repeatedly shown to positively associate with student achievement. Based on these prior findings, I feel it is a safe assumption that if TAP has a significant relationship with achievement, then the direction of that relationship will be positive. The  $p$ -values generated for the TAP coefficient in the achievement models were adjusted accordingly.

In building the achievement models, I first constructed fully unconditional models to calculate the intraclass correlation coefficients for both grades. The intraclass correlation coefficients parse out the variance in the outcome to each of the three levels. I then added the TAP variable to the models to investigate how TAP was associated with reading comprehension scores without any controls in the models. By doing so, I was able to obtain the relationship between TAP and student achievement without any covariates. I then added in controls at all three levels. At the student-level, I employed controls for a student's prior year achievement on the same subtest, as well as a student's gender, minority status (non-white or non-Asian), FRL eligibility, LEP status, and special education status. The classroom-level covariates included the percentage of students in the class that were female, eligible for FRL, minority, LEP, and special education as well as an indicator for whether or not the teacher was new to the school. The main variable of interest, the level of TAP in the school, was modeled at the school-level. School-level controls included aggregated student characteristics to again parse out the context effects of the students in the school. I finally tested the four measures from the validity section (quality of professional development, teacher-teacher trust, reflective dialogue, and

innovation) in the achievement models to see if and how they mediated the way in which TAP associated with achievement.

All continuous variables were standardized to a mean of 0 and standard deviation of 1, and dichotomous variables were left unstandardized for ease of interpretation. In addition, continuous variables at all levels were grand-mean centered, while dichotomous variables were left uncentered. It is most appropriate to grand-mean center variables when investigating the influence of an effect from top most level (Enders & Tofighi, 2007). The equation for the final HLM model, with all controls at every level, is given below.

Level 1:

$$y = \pi_0 + \pi_1(\textit{Female}) + \pi_2(\textit{FRL}) + \pi_3(\textit{Minority}) + \pi_4(\textit{LEP}) + \pi_5(\textit{SpecialEd}) + \pi_6(\textit{Comp07}) + \varepsilon$$

Level 2:

$$\pi_0 = \beta_{00} + \beta_{01}(\textit{newTeacher}) + \beta_{02}(\textit{cla\_female}) + \beta_{03}(\textit{cla\_FRL}) + \beta_{04}(\textit{cla\_LEP}) + \beta_{05}(\textit{cla\_specialEd}) + \beta_{06}(\textit{cla\_minority}) + \rho_0$$

$$\pi_1 = \beta_{10}$$

$$\pi_2 = \beta_{20}$$

$$\pi_3 = \beta_{30}$$

$$\pi_4 = \beta_{40}$$

$$\pi_5 = \beta_{50}$$

$$\pi_6 = \beta_{60}$$

Level 3:

$$\beta_{00} = \gamma_{000} + \gamma_{002}(TAP) + \gamma_{003}(sch\_FRL) + \gamma_{004}(sch\_LEP) + \gamma_{005}(sch\_specialEd) + \gamma_{006}(sch\_Minority) \\ + \gamma_{007}(sch\_female) + \gamma_{008}(Trust) + \gamma_{009}(Innovation) + \gamma_{0010}(QualityPD) + \gamma_{0011}(ReflectiveDialogue) + u_{00}$$

$$\beta_{01} = \gamma_{010}$$

$$\beta_{02} = \gamma_{020}$$

$$\beta_{03} = \gamma_{030}$$

$$\beta_{04} = \gamma_{040}$$

$$\beta_{05} = \gamma_{050}$$

$$\beta_{06} = \gamma_{060}$$

$$\beta_{10} = \gamma_{100}$$

$$\beta_{20} = \gamma_{200}$$

$$\beta_{30} = \gamma_{300}$$

$$\beta_{40} = \gamma_{400}$$

$$\beta_{50} = \gamma_{500}$$

$$\beta_{60} = \gamma_{600}$$

## Chapter 4

### Results

I begin this chapter by briefly discussing the descriptives of the teacher's academic press (TAP) scores as well as the other four school-level constructs. I then address my first research question: Does the survey scale used in this study validly measure Teacher's Academic Press and are the scores reliable? This section will include discussions of the factor analysis of the TAP scale and bivariate correlations of TAP with other school-level measures. I next present the results of my second research question: Does the level of Teacher's Academic Press in an elementary school have a significantly positive association with student achievement in reading comprehension when controlling for demographic characteristics and other school-level measures? This section includes full models for both second and third grades.

#### Teacher's Academic Press and School-Level Constructs Descriptives

TAP and the four school-level mediators (teacher-teacher trust, innovation, quality of professional development, and reflective dialogue) were all created by separate principal components analyses. Factor scores from this process are automatically standardized so all five of the constructs had means of zero and standard deviations of one. Histograms for each factor are included below to show the distribution of the scores across the schools in the sample.

The distribution of TAP scores shows a somewhat normal shape with a negative skew. The majority of schools fell in the range of -2 to 2, but a small number of schools did fall below -2 indicating that these schools tended to score lower on the TAP construct. The other four school-level constructs also tended towards normality with very few outliers above or below two standard deviations from their respective means.

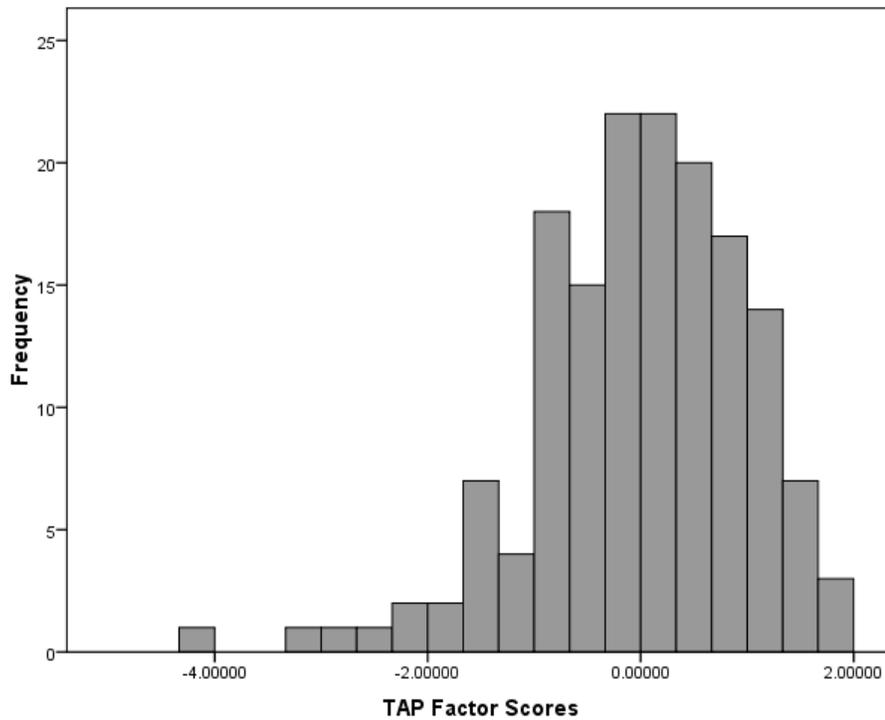


Figure 4.1 Histogram of TAP Factor Scores (n=157).

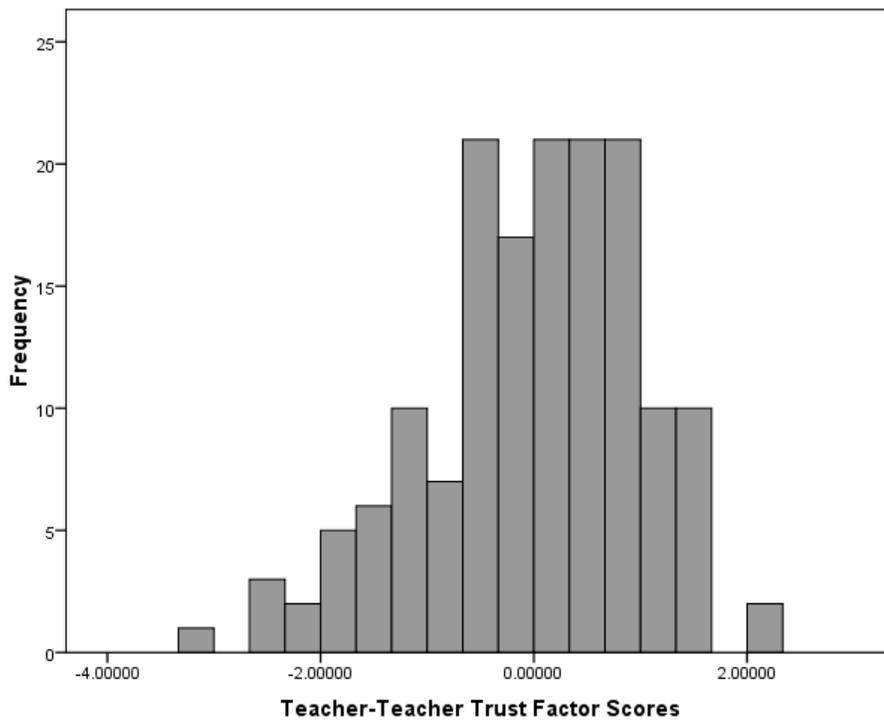


Figure 4.2 Histogram of Teacher-Teacher Trust Factor Scores (n=157).

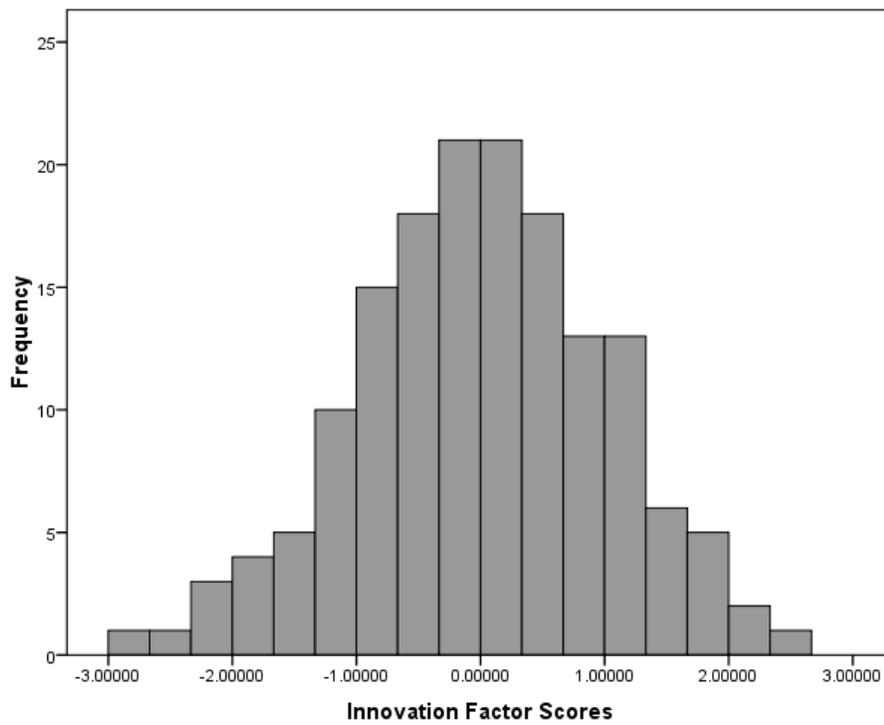


Figure 4.3 Histogram of Innovation Factor Scores (n=157).

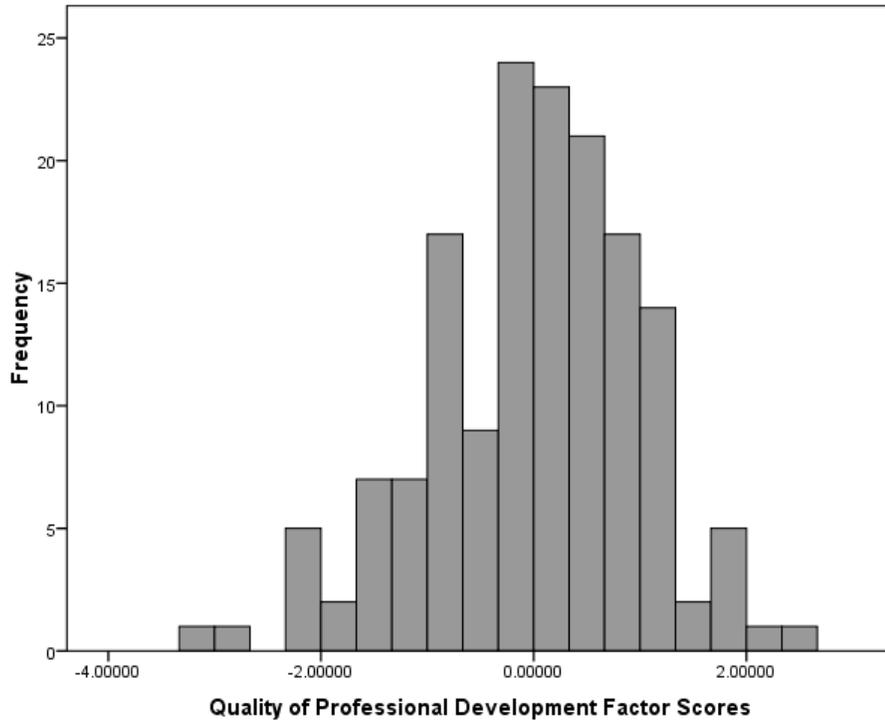


Figure 4.4 Histogram of Quality of Professional Development Factor Scores (n=157).

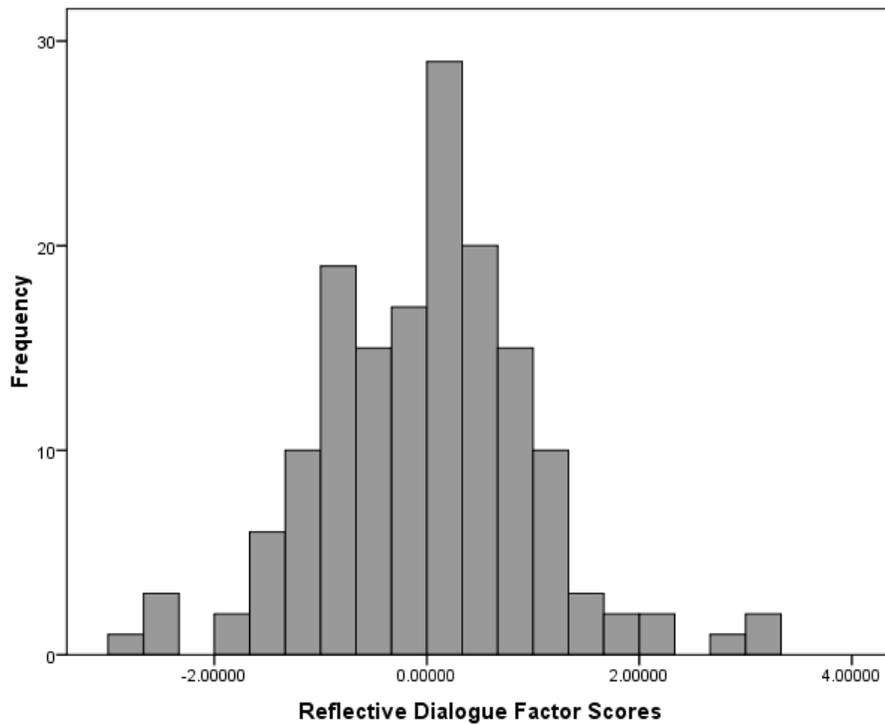


Figure 4.5 Histogram of Reflective Dialogue Factor Scores (n=157).

## Teacher's Academic Press Validity and Reliability

The first research question in this study investigated the validity and reliability of the TAP survey scale and scores, and the first area of validity I examined was evidence based on questionnaire content, which centers on whether the survey items are tapping the ideas they are intended to. In Table 3.5 in the previous chapter, I listed the eight items, the dimension they tap (mastery learning or high expectations for all), and their origins. The first three items all tap the idea of high expectations for all students. This is clear in items 2 and 3. Item 1 taps more of a behavioral result of holding the high expectation belief. When teachers hold high expectations for all students, their actions will evolve to constantly focus on what is best for student learning. The first two items are also more geared towards behaviors and beliefs across the school as opposed to specifically teachers; however, teachers tend to be the main actors in schools, and these items are thus still similar to the other six that tap specifically into collective teacher beliefs and actions. The Consortium for Chicago School Research (2000) used the first item in a construct to measure collective focus on student learning. The second and third items also originated from the Consortium's scale called "focus on student learning." Both were also items used by Goldring and colleagues (2008) in their measure of TAP. Items 4 through 8 all tap the area of mastery learning. Item #4 was also used in the Goldring, et al. measure of teacher's academic press. The fifth item originated from the Study of Instructional Improvement's teacher survey (2001). The final three items all came from Leahy's measure of organizational mastery orientation (2007). These items were specifically adapted from the Patterns of Adaptive Learning survey to measure whether or not a school holds a mastery learning orientation. All five items deal with

whether or not teachers in the school focus on individual effort and improvement, as well as the mastery of basic skills.

The next type of validity that I investigated was evidence based on internal structure, and this form of validity focuses on how the individual items interact with each other. Factor analysis of the eight items yielded a single factor with an eigen value of 5.635 and a variance explained of 70.434% (results can be found in Table 4.1). All of the factor loadings were above 0.65, which indicates that all eight items were contributing to the factor. The two highest loaders were both mastery orientation questions: “Teachers in this school place an emphasis on really understanding schoolwork, not just memorizing it,” and “Teachers in this school encourage students to keep trying even when the work is challenging.” The next two highest loaders were items that deal with high expectations for all students: “This school has high expectations for our students’ achievement,” and “Teachers in this school think it’s important that all students do well in their class.” The items did not appear to be separating out based on theoretical dimension (expectations vs. mastery orientation), which seemed to indicate that the items are all tapping the same latent construct.

Table 4.1

Teacher’s Academic Press Factor Analysis Results	
	Factor Loadings
When making important decisions, the school always focuses on what’s best for student learning.	.684
This school has high expectations for our students’ achievement.	.893
Teachers in this school think it’s important that all students do well in their class.	.900
Teachers in this school encourage students to keep trying even when the work is challenging.	.927

Students at this school are expected to master the content they are working on before moving to new topics.	.661
Teachers in this school stress the importance of “trying hard” to the students.	.824
Teachers in this school let students know that making mistakes is OK as long as they are learning and improving.	.862
Teachers in this school place an emphasis on really understanding schoolwork, not just memorizing it.	.916
Eigen Value	5.635
Percent Variance Explained	70.434%
Cronbach’s Alpha	.920

The final area of validity I explored was evidence based on relation to other variables, which deals with the connections the scale has to other measures based on prior theoretical and empirical work. Based on the literature review, I would expect TAP to positively correlate with measures of teacher-teacher trust, the quality of professional development, innovation, and reflective dialogue. Rationales for TAP’s association with each of these correlates, as well as descriptions of how each construct was measured, were given in Chapter 3. Correlations are given in Table 4.2.

Table 4.2

Variable	1.	2.	3.	4.	5.
1. TAP	1.00				
2. Teacher-Teacher Trust	.634**	1.00			
3. Innovation	.676**	.782**	1.00		
4. Reflective Dialogue	.529**	.616**	.598**	1.00	
5. Professional Development Quality	.309**	.412**	.330**	.412**	1.00

\*\*  $p \leq 0.01$

The level of TAP in the school was very strongly and positively correlated with both the level of teacher-teacher trust ( $r = 0.634$ ) in the school and the level of innovation

( $r = 0.676$ ) that teachers report in the school. Given the high coefficient of both relationships, it appears that schools characterized by high TAP tended to be also characterized by a high amount of trust among teachers and a good deal of innovation in teaching practices. In addition, the strong correlation between TAP and reflective dialogue ( $r = 0.529$ ) seems to indicate that teachers in a school with a relatively high level of TAP were in schools where teachers spent more time discussing issues of teaching and learning. TAP also positively correlated with the quality of the professional development, as reported by the teachers ( $r = 0.309$ ). These correlations lend credence to the validity of the TAP construct by showing that the measure did have significant associations with other similar constructs.

Given the high correlations, I ran a factor analysis with all 34 survey items to see if the TAP items factored separately from the items in the other four scales. This allowed me to investigate whether TAP was distinct from these school level measures, which is a measure of discriminant validity. The results of this factor analysis, which was a principal components analysis with Varimax rotation, are shown below (Table 4.3). To identify which component(s) items loaded on, I looked for loadings that were .5 or higher. Seven of the eight TAP items loaded together on the third component, while no other items loaded on that component with a loading greater than .5. However, TAP1 (“When making important decisions, the school always focuses on what’s best for student learning.”) seemed to load on three different components including the third one with the other TAP items. Apparently, this item has strong enough correlations with the items from the other scales to load in multiple places, but nevertheless, the item does correlate strongly enough with the TAP items to warrant inclusion.

Table 4.3

Rotated Component Matrix of Items from TAP, Teacher-Teacher Trust, Innovation, Quality of Professional Development, and Reflective Dialogue

Item	Component					
	1	2	3	4	5	6
Trust3	.899	.097	.210	.030	.176	-.043
Trust4	.865	.169	.228	-.010	.106	-.100
Trust5	.856	.167	.264	.048	.208	-.005
Trust2	.828	.137	.272	.080	.088	-.070
Trust6	.819	.157	.321	.069	.102	-.029
Trust1	.806	.158	.210	.069	.013	-.044
Refl.Dia.3	.750	.159	.177	.240	.023	.197
Refl.Dia.2	.740	.117	.204	.238	-.054	.265
Refl.Dia.1	.737	.127	.266	.233	.010	.269
Innov.1	.693	.201	.292	.136	.352	.148
Innov.2	.647	.180	.327	.111	.396	.086
Qual.PD9	.151	.883	.069	.136	.025	.010
Qual.PD4	.088	.870	.036	.113	.180	.038
Qual.PD3	.110	.860	.163	.003	.154	.058
Qual.PD7	.178	.858	.053	-.016	-.073	-.084
Qual.PD5	.137	.830	.028	.105	.084	.091
Qual.PD6	.166	.701	.137	.206	-.092	.271
Qual.PD8	.201	.671	.161	.156	-.063	.141
Qual.PD2	.081	.657	.071	.071	.048	.538
TAP7	.316	.075	.851	.011	.018	-.140
TAP8	.314	.108	.835	.073	.155	.094
TAP6	.258	.162	.818	.087	-.051	-.071
TAP2	.331	.074	.794	.147	.118	.120
TAP3	.352	.143	.791	.056	.192	.078
TAP4	.471	.073	.776	.098	.094	.103
TAP5	.113	.082	.574	.088	.286	.393
Refl.Dia.4	.119	.154	.036	.843	.065	.171
Refl.Dia.7	.163	.108	.057	.801	-.021	.170
Refl.Dia.5	.068	.112	.042	.780	.274	-.030
Refl.Dia.6	.169	.147	.228	.621	-.113	-.147
Innov.4	.474	.101	.286	.092	.728	-.025
Innov.3	.468	.061	.306	.135	.643	-.109
Qual.PD1	-.004	.326	.023	.072	-.129	.693
TAP1	.438	.064	.415	.148	.240	.451

Note: Loadings were rotated using a Varimax method with a Kaiser Normalization.

In addition to investigating validity, I examined the reliability of the scale. The TAP items had a Cronbach’s alpha of 0.92, which is strong. This statistic indicated that the scores from the 8 survey items had a high internal consistency and were most likely tapping the same latent construct.

### Bivariate Correlations

Outside of the four school-level constructs used above, I also investigated the correlation between TAP and measures of school-level student demographics and average student achievement (Table 4.4). TAP was not significantly associated with any of the measures of school demographics: percent FRL students, percent minority students, percent LEP students, and percent students designated as special education. TAP significantly correlated with the school-level average achievement in reading comprehension in both second grade and third grade. The relationship was stronger in second grade than in third grade, which I take as an indication that it is important to keep the grades separate in my analyses. Though the correlations imply that TAP was connected to student achievement, multilevel modeling and the inclusion of covariates will help to clarify whether TAP and achievement were correlated, once association with other measures is taken into account.

Table 4.4

Correlations of Teacher’s Academic Press with School-level Demographics

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. TAP	1.00							
2. Percent FRL	-.110	1.00						
3. Percent Minority	-.114	.657**	1.00					
4. Percent LEP	.019	.256**	-.051	1.00				

5. Percent Special Education	.020	.034	-.020	-.129	1.00			
6. Percent Female	-.043	.151	.090	-.002	-.152	1.00		
7. Grade 2 Avg. Reading Comp.	.268**	-.711**	-.563**	-.163*	.041	-.080	1.00	
8. Grade 3 Avg. Reading Comp.	.217**	-.677**	-.661**	-.107	.010	-.043	.670**	1.00

\*  $p \leq 0.01$ , \*\*  $p \leq 0.01$

### Achievement Models

In answering my second research question, regarding TAP's association with student achievement, I began by constructing fully unconditional models, which parse out the variance to the student-, classroom-, and school-levels for each grade. The statistics associated with these analyses are included below in Table 4.6. The second grade statistics indicate that 81.51% of the variance in reading comprehension achievement is at the student-level. A little over 8% of the variance was at the classroom-level, and nearly 10.5% of the variance was attributable to the school-level. The third grade had similar variance decomposition with slightly less variance at the student-level (78.98%) and slightly more at both the classroom (9.68%) and school-levels (11.34%). The school-level variances are the most important for this analysis as they indicate that there was significant variability in reading comprehension attributable to differences in schools that can be modeled.

Table 4.5

### HLM Statistics from Fully Unconditional Models and Full Models

FUM	Second Grade Statistic	Third Grade Statistic
Within Class & School Variance ( $\sigma^2$ )	0.820	0.808
Between Class & Within School	0.081	0.099

Variance ( $\tau_\pi$ )		
Between School Variance ( $\tau_\beta$ )	0.105	0.116
Student-level Reliability	0.593	0.647
Classroom-level Reliability	0.656	0.637
Percent of Variance Within Class & School	81.51%	78.98%
Percent of Variance Between Class & Within School	8.05%	9.68%
Percent of Variance Between School	10.44%	11.34%
<hr/>		
Full Model		
Within Class & School Variance ( $\sigma^2$ )	0.448	0.450
Between Class & Within School Variance ( $\tau_\pi$ )	0.009	0.009
Between School Variance ( $\tau_\beta$ )	0.035	0.012
Explained Variance Within Class & School	45.37%	44.31%
Explained Variance Between Class & Within School	88.89%	90.91%
Explained Variance Between School	66.67%	89.66%

The achievement models for grades 2 and 3 are presented in Tables 4.6 and 4.7 respectively. The results were similar across the grades, though there were some differences. I present the second grade results first. The first step in building the full achievement model was to examine how TAP associated with achievement without any other controls in the model. In second grade, TAP had a significant coefficient of 0.094 indicating that without any controls, TAP is linked to achievement.

In model 2, I added in demographics at all three levels. At the student-level, all of the covariates were significantly linked to achievement in reading comprehension except for gender. Prior achievement was strongly and positively associated with the outcome with each standard deviation increase in a student's 2007 comprehension score resulting in an average 2008 comprehension increase of 0.621 standard deviations. The rest of the significant controls had negative coefficients. If a student was designated as special

education, he or she scored, on average, .186 of a standard deviation below non-special education students. Being FRL and a racial minority student also had strong negative associations with coefficients of -0.175 and -0.117 respectively. LEP had the weakest effect at this level at -0.069, though it was still significant.

Not all of the demographic measures had a significant effect at the classroom-level. Only the percent of FRL students had a significant association with student achievement in reading comprehension. A one standard deviation increase in the percent of FRL students above the average in the sample tended to decrease the average reading comprehension score of the class by 0.096 of a standard deviation. Whether or not the teacher was new to the school did not seem to affect student achievement.

However, my main interest is at the school-level. My research hypothesis focused on the effect that TAP had on student achievement, and according to these results, the level of teacher's academic press in the school significantly and positively influenced second grader's reading comprehension. With a standard deviation increase in the level of TAP in the school, students tended to increase their average comprehension scores by 0.026 of a standard deviation. In addition to TAP, the percent of FRL (*beta* = -0.133) significantly affected student performance, which means that as the number of FRL students in a school increased student performance tended to decrease. Interestingly, the percent of LEP (*beta* = 0.032) and the percent of special education students (*beta* = 0.106) in the school positively associated with achievement in reading comprehension. Apparently, schools with more LEP students and more special education students had, on average, higher student achievement when controlling for the other variables.

In the final step of the model, I added the four other school-level measures: teacher-teacher trust, innovation, reflective dialogue, and professional development quality. At the student and classroom levels, the model changed very little in this step with only slight fluctuations in the coefficients. At the school level, only reflective dialogue was related to achievement ( $\beta = -.043$ ), but the coefficient was only marginally significant ( $p \leq 0.1$ ). Interestingly, the effect is negative indicating that more reflective dialogue in a school, according to teacher assessments, tended to lower reading comprehension scores. However, TAP was no longer significant in this final model. The coefficient remained the same but the standard error increased, resulting in a loss of significance.

Table 4.6

Second Grade Achievement Model (n=154 schools, 438 classrooms, 6,205 students)			
	Model 1	Model 2	Model 3
	Beta Coefficient (Standard Error)	Beta Coefficient (Standard Error)	Beta Coefficient (Standard Error)
<u>School-level</u>			
Intercept	-0.002 (0.032)	0.260*** (0.036)	0.259*** (0.036)
TAP	0.094** (0.031)	0.026~ (0.018)	0.027 (0.023)
School FRL	--	-0.133** (0.041)	-0.135*** (0.040)
School LEP	--	0.106* (0.043)	0.106* (0.044)
School SE	--	0.032~ (0.019)	0.036~ (0.019)
School Minority	--	-0.041 (0.064)	-0.028 (0.065)
School Female	--	0.006 (0.016)	0.009 (0.015)
Teacher-Teacher Trust	--	--	0.033 (0.026)
Innovation	--	--	0.001

			(0.028)
Reflective Dialogue	--	--	-0.043~
			(0.024)
Professional Development Quality	--	--	0.005
			(0.019)
<u>Classroom-level</u>			
New Teacher in School	--	0.014	0.014
		(0.019)	(0.019)
Class FRL	--	-0.096*	-0.088*
		(0.042)	(0.043)
Class LEP	--	-0.039	-0.038
		(0.027)	(0.027)
Class SE	--	0.073	0.066
		(0.061)	(0.062)
Class Minority	--	-0.042	-0.042
		(0.035)	(0.034)
Class Female	--	0.007	0.004
		(0.029)	(0.029)
<u>Student-level</u>			
FRL	--	-0.175***	-0.175***
		(0.031)	(0.031)
LEP	--	-0.069*	-0.069*
		(0.033)	(0.033)
SE	--	-0.186***	-0.187***
		(0.034)	(0.034)
Minority	--	-0.117***	-0.118***
		(0.032)	(0.032)
Female	--	0.009	0.009
		(0.021)	(0.021)
Comprehension 2007	--	0.621***	0.621***
		(0.014)	(0.014)

\*\*\*  $p \leq 0.001$ , \*\*  $p \leq 0.01$ , \*  $p \leq 0.05$ , ~  $p \leq 0.10$

The third grade showed similar results for the most part; however, there were some important differences. In the first stage of the model, with no controls, TAP was again significantly associated with reading comprehension ( $beta = 0.079$ ), but the coefficient was slightly smaller than the second grade coefficient. In Model 2, many of the covariates were significant. At the student-level, the indicators for FRL had an effect

of -0.187. Students who were minority and special education status scored, on average, .168 standard deviations below their peers. If the student was designated as LEP, he or she scored about nine hundredths of a standard deviations below his or her peers. In addition, girls scored slightly higher (about four hundredths) on the reading comprehension assessment than boys on average. Prior achievement again showed a very strong association with current achievement, as the coefficient was 0.624.

For the classroom-level, the percent of FRL students, percent of minority students, and the new teacher indicator were all significant. Schools that were one standard deviation higher in the percent of FRL students in the classroom had, on average, 0.042 standard deviations lower achievement, while a one standard deviation change in the percent of minority students in the classroom showed an average change of -0.086 standard deviations. Students in a classroom with a teacher who was new to the school had lower achievement on average by nearly seven hundredths of a standard deviation.

The only school level measure that had a significant relationship with student achievement was TAP. Schools that were one standard deviation higher in the level of TAP had an average reading comprehension performance 0.036 standard deviations higher. This result is slightly larger than the second grade result.

In the final model of the third grade, none of the four additional variables were significant, unlike the second grade where reflective dialogue was marginally significant. TAP remained significant with a slightly reduced coefficient ( $\beta = 0.033$ ) and increased standard error, which in turned lowered the significance level from  $p \leq 0.05$  to  $p \leq 0.10$ .

Like the second grade model, the rest of the controls remained relatively unchanged from Model 2 to Model 3.

Table 4.7

Third Grade Achievement Model (n=154 schools, 421 classrooms, 6,112 students)

	Model 1	Model 2	Model 3
	Beta Coefficient (Standard Error)	Beta Coefficient (Standard Error)	Beta Coefficient (Standard Error)
<u>School-level</u>			
Intercept	-0.028 (0.033)	0.298*** (0.036)	0.298*** (0.036)
TAP	0.079* (0.035)	0.036* (0.017)	0.033~ (0.024)
School FRL	--	0.011 (0.032)	0.010 (0.033)
School LEP	--	0.012 (0.027)	0.013 (0.026)
School SE	--	-0.015 (0.020)	-0.014 (0.020)
School Minority	--	0.058 (0.055)	0.060 (0.055)
School Female	--	0.001 (0.016)	0.002 (0.015)
Teacher-Teacher Trust	--	--	0.005 (0.031)
Innovation	--	--	0.009 (0.031)
Reflective Dialogue	--	--	-0.006 (0.023)
Professional Development Quality	--	--	-0.009 (0.023)
<u>Classroom-level</u>			
New Teacher in School	--	-0.069* (0.032)	-0.069* (0.032)
Class FRL	--	-0.042~ (0.025)	-0.042~ (0.025)
Class LEP	--	-0.026 (0.026)	-0.025 (0.026)
Class SE	--	-0.029 (0.021)	-0.029 (0.021)
Class Minority	--	-0.086~	-0.086~

Class Female	--	(0.048) 0.004 (0.017)	(0.048) 0.004 (0.017)
<u>Student-level</u>			
FRL	--	-0.187*** (0.027)	-0.187*** (0.027)
LEP	--	-0.088* (0.042)	-0.088* (0.042)
SE	--	-0.167*** (0.029)	-0.167*** (0.034)
Minority	--	-0.168*** (0.029)	-0.168*** (0.029)
Female	--	0.038~ (0.019)	0.038~ (0.019)
Comprehension 2007	--	0.624*** (0.013)	0.624*** (0.013)

---

\*\*\*  $p \leq 0.001$ , \*\*  $p \leq 0.01$ , \*  $p \leq 0.05$ , ~  $p \leq 0.10$

The variance decompositions shown in Table 4.5 indicate the both models explained nearly half of the variance, roughly 45%, at the student-level. In addition, both of the models from second and third grades accounted for a large amount of variance across classrooms, 89% and 91% respectively. TAP, the aggregated demographic characteristics, and the four other school-level factors explained nearly 67% of the second grade and 90% of the third grade reading comprehension achievement variance between schools.

In summary, TAP tended to have a positive association with student's performance on a reading comprehension assessment in both second and third grades even in the presence of a three level model with a number of covariates at every level. However, these effects were not always apparent with the inclusion of the four additional survey factors in the second grade. The high correlations among these different measures of culture may indicate that multicollinearity was a problem in the final model, which

will be discussed further in the next chapter. In addition, both models explained a large amount of the school-level variance indicating that the models were decently specified.

## Chapter 5

### Discussion

In this dissertation, I set out to explore teacher's academic press (TAP), an aspect of the cultural system in a school. The cultural system may explain why some large-scale reform efforts have varied effects in reaching their goals of improving student achievement. For example, the Reading First (RF) program has shown mixed results in its stated goal of raising reading achievement of kindergarten through third grade children in high-poverty schools (Gamse, et al., 2008; Carlisle, Schilling, Zeng, & Kleyman, 2006), and it is not always clear why some schools benefit more from the RF initiative than others. The social system of school has the potential to hold answers. This model explains how teaching and learning is influenced by four subsystems: the political, the individual, the structural, and the cultural (Hoy & Miskel, 2001). Policies can affect each subsystem to varying degrees, but the cultural system tends to be the most difficult to reach as it is informal. The cultural system, also known as school culture, contains the values, assumptions, norms, and beliefs that socialize the behavior of school members. As past research has shown that aspects of school culture can positively influence achievement, TAP may be a way to explain differences in reading achievement in RF schools. To this end, I investigated the two following research questions.

Research Question 1: Does the survey scale used in this study validly measure Teacher's Academic Press and are the scores reliable?

Research Question 2: Does the level of Teacher's Academic Press in an elementary school have a significantly positive association with student achievement in reading comprehension when controlling for demographic characteristics and other school-level measures?

In this chapter, I will interpret the results generated from studying these two questions. I begin with a discussion of the TAP construct and what it implies for theory. Next, I review the validity and reliability evidence for the scale and scores, as well as how TAP correlated with other school-level measures. I then explore the findings of the achievement models. Finally, I discuss the limitations of the study and posit areas for future research.

### Teacher's Academic Press: Theory and Measurement

This study contributes to the theoretical framework of academic press. Academic press is a characteristic of the cultural subsystem of a school. The cultural subsystem, along with the structural, individual, and political subsystems, all have the ability to influence the technical core of a school, teaching and learning, which in turn affect student achievement (Hoy & Miskel, 2001). The literature generally defines academic press as the quest for academic excellence in a school (Hoy, Sweetland, & Smith, 2002). More specifically, Murphy and colleagues (1982) laid out a framework for conventional

academic press that encompasses teacher and principal belief structures, classroom practices, and school policies, which all lead into student norms and belief structures (see Figure 2.1). Authors have consequently measured academic press in a plethora of ways, including teacher and student attitudinal survey responses, indicators of school policies, and course enrollment and offering information. Although findings have consistently shown that academic press is important in schools, measurement of the construct has been inconsistent, and nowhere in the literature did researchers measure the construct solely through teachers' collective belief structures.

Recent authors have provided a more focused framework for academic press that consists solely of teacher's perceptions of the collective belief structures in the school around high expectations for all students and mastery learning orientation (Scheerens & Bosker, 1997). Researchers have also established that this construct, teacher's academic press, is associated with leadership, school environment, and instruction (McRel, 2005; Goldring, et al., 2008). The findings presented in this dissertation add to the strength of this conceptual framework for academic press by showing that it is associated with student achievement.

The first research question in this dissertation focused on establishing validity for the TAP scale and reliability of the scores from this study. Findings indicated that the scale has established validity in three key areas: evidence based on internal structure, evidence based on questionnaire content, and evidence based on relations to other variables. The Standards for Educational and Psychological Testing (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999) cited these three forms of evidence as

crucial to the establishment of validity. Results from the factor analyses presented in Table 4.1 indicated that the TAP scale does have strong evidence based on internal structure. All of the items loaded on a single factor that had a high percent of explained variance (70.43%), which indicates that the variation in the factor accounted for the majority of the variance in the individual items. In addition to internal structure, the TAP scale also showed evidence based on questionnaire content. All of the items reflect either mastery learning or high expectations for all students, and as discussed in Table 3.5, each item has previously been used in well-established surveys to tap the areas they are meant to tap.

Results also indicated that the scale had evidence based on relation to other variables. The correlations of TAP to other school-level measures are detailed in Tables 4.2 and 4.4. Based on prior theoretical work, TAP should positively correlate with measures such as reflective dialogue, teacher-teacher trust, quality of professional development, and innovation. This TAP scale did significantly correlate with all four of these conceptually related constructs. The correlations were strong, ranging from 0.309 to 0.676. However, the magnitude of the relationships could indicate that the constructs were not distinct from each other. To that end, I conducted a factor analysis with all of the items from the five constructs (TAP, teacher-teacher trust, innovation, reflective dialogue, and quality of professional development) as a test of discriminant validity. As can be seen in Table 4.3, the TAP items loaded on a separate component from the other items, which indicated that TAP is distinct from the other constructs. Furthermore, the scores had a very strong reliability with an average Cronbach's alpha of 0.92.

In addition to the validity, the new scale seems to be stronger than the factors used in both the Goldring et al. (2008) and McRel (2005) papers. Goldring and colleagues employed four items that had an internal reliability of 0.86, which is lower than the reliability of the TAP scores at 0.92. Three of the same items from this study are employed here (see Table 3.5), and those items were in the top four loaders of the TAP scale. This is not surprising, given that they were attempting to measure the same construct that I am measuring. That I have other items loading strongly indicates that my measure may be more robust than theirs. The McRel study employed an eight-item factor in their measure of TAP, and the items tapped both mastery learning (e.g. “The primary mission of my school was that all students became proficient in core subjects.”) and high expectations (e.g. “My school had an explicit statement of high expectations concerning student achievement.”). The scales used in this study and by McRel are similar, but the scores generated here had a higher reliability (0.92) than McRel (0.84). Future research could compare the two scales to establish which is the better measure of TAP.

By establishing the validity of TAP, the results of this study can encourage the examination of how TAP interacts with traditional versions of academic press. Future research can investigate how distinct TAP is from conventional measures of academic press. If TAP represents a form of academic press, then it may be possible to establish other forms of academic press—for example, student’s academic press that would be based solely on student’s perceptions of academic press within their school. The large and varied literature on conventional academic press may have simply been measuring, and at times mixing, different forms of academic press that are all related but also

distinct. By parsing out these different areas of academic press, researchers can then begin to understand their influence in schools.

### Teacher's Academic Press and Other School-level Measures

The correlations presented in Tables 4.2 and 4.4 also provide some insight into TAP and the other areas of schooling with which it is associated. TAP showed strong correlations with the level of teacher-teacher trust, the level of reflective dialogue, the reported quality of professional development, and the level of innovation in the school. These results were expected, based on the literature review, and they helped to provide validity evidence for the TAP scale. In addition, the correlations provided information on what high and low TAP schools might look like in terms of other school-level constructs. For a majority of teachers to expect that all students in the school can master critical skills and achieve at high levels, the school probably needs an atmosphere of trust. Trust among teachers is an important characteristic in schools, and this large, positive correlation ( $r = 0.634$ ) with TAP indicates that a trusting atmosphere may be necessary for TAP to emerge. Inherent in the construct of trust are five characteristics: benevolence, openness, honesty, reliability, and competence (Hoy & Tschannen-Moran, 1999). For teachers to collectively believe in mastery learning and high expectations for all students, the faculty seems to need a high level of belief in these five areas but probably most of all in the competence of their colleagues to meet the demands of a school where the faculty believes in high expectations and mastery learning.

If teachers trust each other, then they may be more willing to collaborate and share their instructional techniques, which is the central idea of reflective dialogue. In a

highly collaborative environment, teachers tend to be more willing to honestly discuss values and assumptions without fear of professional embarrassment or stigmatization (Evans-Stout, 1998; Little, 1990), as well as consider other's viewpoints and ideas (Hord, 1986). "When teachers trust and respect each other, differences of opinion and philosophy are more readily accepted" (Brownell, Yeager, Rennells, & Riley, 1997, p. 346). By engaging in dialogue that is centered on issues of teaching and learning, which are at the heart of the school's social system, teachers can share their best practices as well as seek help for their instructional difficulties. The high correlation between TAP and reflective dialogue ( $r = .529$ ) indicates that teachers in schools characterized by a relatively high level of TAP tended to be engaging more in this form of collaboration. In these schools, teachers were apparently having conversations that were focused on issues of instruction that have the potential of improving the educational experience for students.

Having teachers share their practice in a trusting, collaborative atmosphere does not guarantee that instruction will change once teachers enter their classrooms and close the door. For actual instructional changes to occur, the climate in the school needs to encourage innovation, which is especially important in schools characterized by higher levels of poverty. "[I]n high poverty settings... preservation of the status quo is likely to perpetuate substandard practices in many cases; in such cases, one would hope that professional norms and supports would be oriented toward instructional innovation rather than a maintenance of the status quo" (Bryk, Camburn, & Louis, 1999, p. 759). The level of innovation in a school reflects how willing the faculty is to take risks and try new ideas, and TAP was positively correlated with innovation in this sample. Teachers in a

school with a relatively high score on the TAP scale appeared to be more willing to take risks, more eager to try new methods, and more often learning and seeking new ideas ( $r = .676$ ). In all, teachers in schools characterized by higher level of teacher's academic press seem to trust each other, discuss their practice, and seek out and implement new methods of instruction to improve their classroom.

I had hypothesized that the characteristics of the student body might influence the level of teacher beliefs with regard to TAP; however in this sample, that does not appear to be the case. Neither the percent of racial minority students nor the percent of FRL students was significantly associated with the level of TAP in the school. Given that TAP is based on the concepts of mastery learning and high expectations for all, it is encouraging to see that teachers in more challenging contexts were as likely to have a high level of TAP as their peers in less challenging schools. It is possible, though, that the nature of the schools in this sample may have skewed the results. Relatively high levels of poverty characterized many of the schools; a significant relationship might emerge from a sample with a less restricted range in percent of FRL students. On the other hand, TAP might be truly independent of the characteristics of the student body. Further elucidation of the relationship between school demographics and TAP is important for practitioners to better understand how schools of varying contexts nurture TAP.

#### Teacher's Academic Press and Student Achievement

The achievement models displayed in the results chapter (Tables 4.6 and 4.7) showed that TAP was significantly related to student performance on the ITBS reading

comprehension subtest in both second and third grades. The variance decompositions (Table 4.5) also lent support to the power of the models, as a great deal of the variation in reading comprehension scores were explained in both grades. The percent of variance explained at the student-levels were nearly the same, as the student demographic characteristics and prior achievement explained roughly 45% of the student-level variance. In addition, the models for both grades explained an incredibly large percentage of the variance at the classroom level (approximately 90%). The focus of this study, though, was at the school level. The second grade model accounted for two-thirds of the variance among schools in the ITBS reading comprehension scores, but that percentage was dramatically larger (nearly 90%) in the third grade. This is especially interesting considering that the only significant school-level variable in the third grade model was TAP. Further research is necessary to understand the differences between the two grades.

Finding school-level effects that are malleable can be especially difficult. Prior research has shown that school effects, such as collective teacher properties, account for roughly 20% of the variance in student achievement (Coleman, et al., 1966; Raudenbush & Bryk, 2002) with the rest of the variability in student achievement linked to the qualities with which a student enters school. Schools cannot generally change the 80% of variance that is often attributed to a student's socioeconomic status, race, initial ability, or experiences outside of school. In this analysis, the intraclass correlation coefficient from the fully unconditional model indicated that only 10.44% of the second grade and 11.34% of the third grade reading comprehension variance occurred at the school-level. These numbers were smaller than the prior research, as I parsed out the classroom variance from

the school-level variance, and many studies in the literature were unable to separate the variance attributable to individual classrooms from all classrooms across the school. A combination of the classroom and school variances would roughly result in the commonly cited 20%. Because my analysis had even less variance at the school-level to model than has been the case in prior research, any significant finding for TAP is encouraging.

For both grades, TAP showed a significant association with student performance in reading comprehension when not including the four school-level mediators from the surveys. In second grade, the TAP coefficient was 0.026, which indicated that for every standard deviation change in the level of TAP in the school, student achievement tended to, on average, change by 0.026 standard deviations. The coefficient stayed in the same in Model 3, although the  $p$ -value dropped below significance. This loss of significance could be due to problems with multicollinearity. The high intercorrelations between TAP and the four additional school-level variables (Table 4.2) may be causing problems in estimating the coefficients. Multicollinearity among predictors in a model can cause fluctuations in the parameter estimates, which may account for the increase in the standard error of TAP in Model 3. In the third grade, the coefficient for TAP was 0.036 in Model 2 and 0.033 in Model 3, and the significance level dropped from  $p \leq 0.05$  to  $p \leq 0.10$ . Again, multicollinearity may be responsible for the change in significance level. Overall, the addition of the four school-level measures did not radically change either the second grade or third grade coefficients, and therefore, I believe that the difference in significance from Model 2 to Model 3 should be a large concern in either grade.

The second grade coefficient for TAP ( $\beta = 0.026$ ) was equivalent to half a point increase on the ITBS reading comprehension subtest for every standard deviation increase in the level of TAP in a school. The third grade coefficient was stronger ( $\beta = 0.036$ ), which corresponded to a change of roughly 0.75 points on the ITBS assessment for each standard deviation change in TAP. Neither of these effects was particularly large, and the practical significance of the findings is open to discussion. Half to three-quarters of a point is not a particularly large amount in terms of test scores, but that does not mean that these findings should be discounted. Actually, these effects were not that much smaller than the other school-level effects found in the models. The largest school-level effect detected, which was in the second grade model, was the percent of FRL students in the school where a one standard deviation increase in the percent of FRL students resulted in an average decrease in achievement by about 2.5 points ( $\beta = -0.135$ ). The majority of variables considered in this study were not areas that practitioners or policymakers have much control over such as the demographic makeup of the school or the entering ability of students. Therefore, any malleable aspect of schools, such as school culture, that has a significant influence on achievement cannot be dismissed outright.

Furthermore, this was the first study to investigate the association between TAP and student achievement. It is possible that the effect size could be underestimated. The sample used in this study is restricted in terms of the students and schools as they could only be part of Reading First. A sample with more variation could provide a better estimate of the results. In addition, I only focused on second and third graders that had achievement scores from the previous year. These students have most likely been in the

same school for at least one year and thus experienced that culture and any positive effects from it. Until more research is conducted about TAP, it is too early to decide what the true association with achievement is and whether or not is practically significant.

The achievement models also provided information about the relationships of other variables to student achievement in reading comprehension. Unsurprisingly, prior achievement was the largest predictor of current achievement in both grades, and most of the student level demographic indicators were significantly associated with scores on the ITBS assessments. At the classroom level, only the percent of FRL students was significant in the second grade, but the third grade looked slightly different with the percent of FRL students and the percent of minority students both significantly associating with the outcome. All of the effects were negative indicating that classrooms characterized by students from more disadvantaged backgrounds tended to have lower achievement scores. In addition, third grade classrooms with a teacher who was new to the school had, on average, lower achievement scores on the ITBS reading comprehension subtest.

The effects found at both the student and classroom levels were consistent with prior research; however, there were some surprises at the school level. In the second grade, three of the demographic indicators were significant: percent of FRL students, percent of special education students, and percent of LEP students. While the negative coefficient for the percent of FRL students aligned with the literature, the other two variables showed positive effects indicating that schools with more students designated as special education and more students designated as LEP were performing better on the

ITBS assessment compared to their peers. It is possible that controlling for the demographic characteristics at every level has resulted in these findings, or the positive coefficients could indicate that the RF initiative is finding success in reading LEP and special education students. Additionally, reflective dialogue had a significant and negative relationship with achievement, which is surprising given that prior research has shown that PLCs, of which reflective dialogue is a component, tend to be positively related to achievement (Lee, Smith, & Croninger, 1996). However, an analysis of the reflective dialogue factor in the HLM framework without any other predictors in the model showed that the factor was not significantly related to achievement. Given this, I would hypothesize that the finding is spurious, but future research is necessary to investigate this effect and the other findings.

### Limitations

In interpreting the results of this study, it is important to acknowledge the limitations inherent in the research. The sample of Reading First schools in Michigan provided an interesting venue to study to teacher's academic press, but it was not a random sample and is not generalizable to a larger population of schools. Relatively high levels of poverty and historical underachievement in reading characterized the Reading First schools, and this research cannot thus speak to schools with different demographic characteristics. In addition to the sample, this study is also limited in that the research is not longitudinal. The survey captured only a single year's snapshot of the schools' climates. If students have been in a school for multiple years, then they have been experiencing that school's climate for all of those years. A longitudinal analysis could

take into account the level of TAP in the school for multiple years and how many years students spent in the school. Finally, it is not possible to make causal inferences, based on the results of this study. TAP and student achievement were significantly associated, but that does not mean that raising the level of TAP in a school will necessarily raise student achievement. Again, a longitudinal analysis could be instrumental in establishing causality.

#### Teacher's Academic Press and Future Research

This dissertation has made a significant contribution to the research literature by establishing that TAP is positively associated with student achievement in reading. Specifically, teacher's academic press significantly and positively associated with the reading comprehension performance of both second and third graders in Michigan's Reading First schools, when controlling for a number of covariates including student demographics. However, a great deal of research is still necessary to understand TAP and its effects on students. As mentioned in the limitations section, this analysis was cross sectional, and a future study could employ a longitudinal design to help establish causality. In addition, future research should seek to investigate TAP in a sample of schools that is not limited to Reading First schools. It is unclear from this study what role the RF initiative played in these findings. Exploration of schools with other demographic contexts and other reform contexts could better establish the relationship between TAP and student achievement. Finally, researchers should also endeavor to investigate the influence of TAP on more than just second and third grade reading comprehension. Does

TAP also associate with achievement in mathematics or reading in later grades? Is the relationship different in middle or high schools?

Research in this area may also want to continue the work of Goldring et al. (2008) and McRel (2005) in exploring the association of TAP with other important areas of schooling such as leadership. As discussed earlier, Goldring and colleagues (2008) found that schools with higher levels of TAP tended to have principals that were more balanced in how they reported spending their time, and McRel (2005) demonstrated that TAP, as part of a school environment factor, was also associated with a measure of leadership that consisted of three different dimensions: shared mission and goals, instructional guidance, and organizational change. Most likely, TAP is directly linked to the principal's work in promoting a shared mission and goals. In describing this dimension, McRel says that "[t]he focus is on linking beliefs and actions in the school, for example, academic expectations," (McRel, 2005, p. 9). Building consensus around the mission and values of the school has been shown to be an important part of a transformational leader (Leithwood, Jantzi, & Steinbach, 1998). Research has shown that a principal who is a transformational leader, and specifically takes an active role in building consensus, is often associated with many positive outcomes such as academic success (Goldring & Pasternack, 1994; Hallinger & Heck, 1996). A meta-analysis conducted by Robinson, Lloyd, and Rowe (2008), which included the previous two articles, found that the principal's role in establishing goals and expectations (of which building consensus is a primary component) had an effect size of 0.42 (based on 49 different effect sizes from 7 studies). Given the findings in this dissertation that TAP has a positive relationship with student achievement, researchers may want to explore how school leaders build

consensus around a shared mission that includes TAP. Overall, this work has shown that teacher's academic press and student achievement were related in Michigan's Reading First schools, and this is only the beginning of research in this area that has the potential to help student achievement in the most disadvantaged schools.

## Appendix

I employed multiple imputation to account for missing data in teachers' responses to the eight TAP survey items. Current imputation software did not support factor analysis as a post-imputation analysis. Though it was possible to perform all analyses with each of the five imputed datasets (Raghunathan, Lepkowski, Van Howeyk, and Slenberger, 2001), the process would have been incredibly time consuming. Therefore, I randomly selected one imputed dataset (the third) to use in all analyses. To ensure that this dataset was not remarkably different from the other four, I compared them by factor analyzing each imputed dataset.

The factor loadings, as well as eigen values, variances explained, and Cronbach's alphas, for all five imputed datasets are displayed below in Table A.1. In each of the five factor analyses, all eight items loaded on a single factor, and the five resultant factors are labeled TAP\_1, TAP\_2, etc. The factor loadings tended to be quite stable across the five factors with the widest range being only 0.73. In addition, the eigen values, variances explained, and alpha reliabilities were all nearly identical. Given the incredible similarities in the factor structures, I feel confident that using only the third imputed dataset will be equivalent to using a combination of all five.

Table A.1

Teacher's Academic Press Factor Analysis Results for all Five Imputed Datasets					
	TAP 1	TAP 2	TAP 3	TAP 4	TAP 5
When making important decisions, the school always focuses on what's best for student learning.	.693	.706	.684	.716	.692
This school has high expectations for our students' achievement.	.897	.901	.893	.891	.903
Teachers in this school think it's important that all students do well in their class.	.894	.899	.900	.905	.898
Teachers in this school encourage students to keep trying even when the work is challenging.	.928	.925	.927	.921	.920
Students at this school are expected to master the content they are working on before moving to new topics.	.653	.610	.661	.650	.683
Teachers in this school stress the importance of "trying hard" to the students.	.824	.809	.824	.808	.828
Teachers in this school let students know that making mistakes is OK as long as they are learning and improving.	.852	.856	.862	.851	.842
Teachers in this school place an emphasis on really understanding schoolwork, not just memorizing it.	.921	.918	.916	.906	.915
Eigen Value	5.624	5.576	5.635	5.594	5.646
Percent Variance Explained	70.305%	69.697%	70.434%	69.922%	70.571%
Cronbach's Alpha	.918	.917	.920	.917	.920

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