

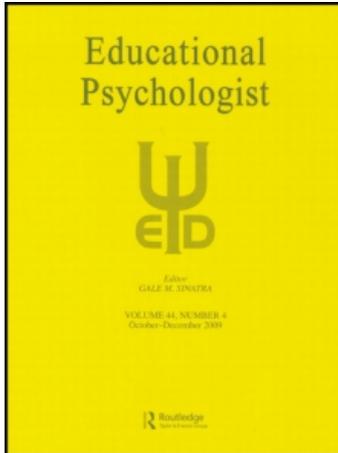
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Personal and Social-Contextual Factors in K-12 Academic Performance: An Integrative Perspective on Student Learning

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Personal and Social-Contextual Factors in K–12 Academic Performance: An Integrative Perspective on Student Learning

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Our extensive literature review in the fields of educational, social, and cognitive psychology has led us to identify about a dozen variables that demonstrate direct empirical links to academic achievement at the K–12 level. Those variables are grouped into four major categories: student engagement, learning strategies, school climate, and social-familial influences. We then categorize the first two variables as *personal* factors and the latter two as *social-contextual* factors. We document empirical findings that have shown particular relationships between the reviewed personal and social-contextual factors and academic achievement, mainly in the areas of reading and mathematics. Based on our conceptualization, we propose an integrated perspective that students' personal factors in the domains of behavior, affect, attitude, and cognition as well as their social-contextual environment have to work in concert to produce optimal school performance. We conclude with a discussion on educational implications and future research to be addressed.

Over the years, researchers have failed to explain causes of the achievement gap (prominent between higher and lower income families) solely by genetic or family socioeconomic factors. Consequently, some researchers have turned their attention to psychological, social-contextual, and emotional factors as possible explanatory variables (Powell & Jacob Arriola, 2003). Advocates of psychological and emotional attributes in students' learning argue that these variables are susceptible to change from the environment, experiences, and social interactions. Several studies have proposed specific psychological and contextual factors in relation to academic success. For example, Sedlacek (2005) presented a fairly comprehensive framework consisting of a number

of components relevant for college students' success (e.g., positive self-concept, realistic self-appraisal, preference for long-term goals, and community involvement). Additional frameworks employing multiple psychological factors have been proposed in relation to graduate students (Kyllonen, Walters, & Kaufman, 2005) and athletes (Hyatt, 2003). However, we have been unable to locate studies that propose a framework that illustrates interaction of these factors leading to academic success in K–12 students.

Our main question in this article is, What are the personal and social-contextual factors that are prominently linked to K–12 educational achievement? To answer this question, we first identify a set of personal and social-contextual variables that are particularly relevant to students' academic achievement at the K–12 grade level; second, we document empirical evidence on how those identified personal and social-contextual variables relate to student outcome measures; and third, we propose a comprehensive framework that reflects the relationships suggested in the extant educational and social psychology literature.

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SELECTION CRITERIA IN THIS REVIEW

We used several databases to locate relevant studies: Educational Resources Information Center (ERIC), Education Research Complete, PsycINFO, and PsycARTICLES. We selected studies published in peer-reviewed journals or books/book chapters and excluded conference papers, unpublished dissertations, working papers, and evaluation reports. We included studies conducted with U.S. samples and had our target population as students in general. Although studies based on particular subgroups help our understanding about students in general, we restricted the scope of our review to studies that had implications for general students and not for students with special talents or difficulties (e.g., gifted students, students with learning and physical disabilities, or students lacking in English language proficiency). We first searched, within the educational and social psychology literature, the studies that have shown strong empirical findings with regards to reading and/or mathematics achievement among school-aged children.

Our approach was comprehensive, so we conducted the search based on “exclusion.” That is, we excluded the studies of which the main focus was the system-level constructs (e.g., school type, class size), curriculum and standards, teaching and classroom activities, resources including socioeconomic status (SES), demographic variables (e.g., gender or race), and national- and state-level issues. We were mainly interested in studies that investigated “psychological” constructs in the context of academic achievement, especially in reading and mathematics. Tens of thousands of studies were located at first, which had been accumulated over 60 years, but the number of studies was considerably narrowed when we included only the studies that employed direct measures of reading and/or mathematics achievement such as standardized tests, teachers’ ratings, and course or semester grades at the K–12 levels. At this point, the number of studies was narrowed down to about 350 articles.

We further narrowed relevant studies to about 150, by including only those that demonstrated moderate to strong effect sizes in their intended results. In interpreting moderate to strong effect sizes, we follow J. Cohen’s (1992) definition: (a) significant, product-moment correlations greater than 0.30; (b) multiple partial correlations, drawn from regression models, that are greater than 0.15; (c) a significant, direct link with standardized path coefficients greater than 0.25 in path or structural equation models; and (d) *d*-indexes greater than 0.50 in comparing independent means in meta-analytic studies. We also gave priority to studies that demonstrated direct effects to academic performance, used appropriate control variables (e.g., family SES), and were based on large sample sizes (if possible). In short, the studies illustrated in this article are chosen because of the direct, effect sizes between the constructs of interest and academic outcome measures. Note that we report correlational results in the present article

whenever the correlation tables are presented in the original studies so that readers can interpret the empirical finding drawn from the same unit of analysis (i.e., ranging from –1 to 1).

BUILDING A FRAMEWORK FOR PERSONAL AND SOCIAL-CONTEXTUAL FACTORS IN K–12 EDUCATION

Based on our review to identify variables that are most relevant to K–12 educational achievement, we have derived four major categories of social-psychological constructs: student engagement, learning strategy use, school climate, and social-familial influences. These four variables are the building blocks of our framework. Drawn from the social-cognitive literature, we broadly categorize student engagement and learning strategy as *personal factors*, and the latter two variables, school climate and social-familial influences, as *social-contextual factors*.

Personal factors are within-student characteristics, involving psychological, cognitive, and behavioral variables. Social-contextual factors involve the variables that originate from outside of the student. There is no black-and-white distinction between personal and social-contextual factors. In fact, these two groups of factors are so intertwined that it is sometimes hard to discern their origin (i.e., inside or outside of the student). For instance, students’ engagement with schoolwork can originate from the student’s own motivation but may also be heavily influenced by the social context. Nevertheless, we decided to categorize our major factors into one or the other, based on the locus of control on the student’s part. That is, the locus of control shifts from inside-to-outside of the student: from student engagement to learning strategies to social-contextual influences. Many of the student engagement variables reside within a student’s mind, will, and/or attitude. Schools can teach students about particular learning strategies, but it is the student herself who ultimately decides to employ (or not) the instructed or learned strategies. On the other hand, the locus of control shifts more to the outside world when considering social-contextual factors.

With our major four groups of psychological constructs (i.e., student engagement, learning strategy, school climate, and social-familial influences), we have created a framework called Personal and Social-Contextual Factors (PSCF) that captures our conceptualization of the interrelationships among variables (Figure 1). Table 1 illustrates a list of the variables that are the focus of this article. The PSCF framework was constructed by first identifying four major groups of psychological constructs, each relating to academic performance.

Our first component, student engagement, is defined by three subcomponents—behavior, cognition, and affect (Fredricks, Bluemfeld, & Paris, 2004), as they relate to academic performance. We conceptualize learning strategy

TABLE 1
Personal and Social-Contextual Factors in K–12 Academic Achievement

<i>Personal factors</i>	
Student engagement	
Behavioral engagement	Attending classes, following rules, participating in school activities
Cognitive-motivational engagement	Preference for challenge, intrinsic motivation, investment in learning, academic self-beliefs
Emotional engagement	Interest, curiosity, sense of belonging, and affective states or feelings
Learning strategies	
Cognitive strategies	Knowledge and skills that support learners as they execute and develop internal information process (e.g., summarizing, inferring, applying, and reasoning)
Metacognitive strategies	Ability to acknowledge, monitor, and evaluate one's own cognitive processes as well as strengths and weaknesses as learners; Conditional knowledge of when, where, why, and how to use specific strategies in cognitive tasks
Behavioral strategies	Behaviors directed toward managing, monitoring, and evaluating one's own action, motivation, affect, and environment
Time management	Managing of effective use of time to maximize productivity
Test-taking strategies	Control of one's cognitive functioning and effort levels before and during test-taking situations
Help-seeking	Behaviors directed toward getting help for learning
Homework management	Ability to monitor motivation and emotion and to complete homework assigned by teachers
Note-taking strategies	Ability to concentrate during lecture and to coordinate multiple cognitive functions
<i>Social-contextual factors</i>	
School climate	
Academic emphasis	Expectations of schools for their students and positive reactions from school community
Teacher variables	Collective efficacy, teacher empowerment, sense of affiliation
Principal leadership	Collegiality, setting high morale, and clearly conveying goals
Social-familial influences	
Parental involvement	Parents' attitudinal, behavioral, and stylistic approach to their child's rearing and education in particular
Peer influences	Peer support, norms, attitude, and behavior including achievement

as composed of three subcomponents: cognition, metacognition, and behavior. We also posit that the main components of school climate include teacher interaction (e.g., Ware & Kitsantas, 2007), principal leadership (Leithwood & Mascall, 2008), and a unique atmosphere of a particular

school created by the school's mission and emphasis (Hoy, Sweetland, & Smith, 2002). Whereas social-family influences can contribute to school climate through parental involvement (Hallinger, Bickman, & Davis, 1996) or peer norms (Syvertsen, Flanagan, & Stout, 2009), we formed the social-familial influence factor as a separate entity in our framework as parents and peers can exert their influence on behavior and attitudes of learners within and outside of school.

Variables within the factors are presumed to be reciprocally interacting with each other. For instance, the two personal factors—student engagement and learning strategy—interact and influence each other. That is, highly engaged students are likely to employ well-developed learning strategies, and students who effectively use various learning strategies would likely maintain a high level of engagement (Fredricks et al., 2004; Pintrich & DeGroot, 1990; Zimmerman, 1990). In relation to the social-contextual factors, it is conceivable that parents can initiate and motivate a school's climate in a certain direction (Hallinger et al., 1996), and vice versa—schools' particular programs and policies can motivate parents and students to engage in positive (or negative) behaviors.

We have also established a bidirectional relationship in the PSCF framework between the personal and social-contextual factors. Although it is more likely that social-contextual

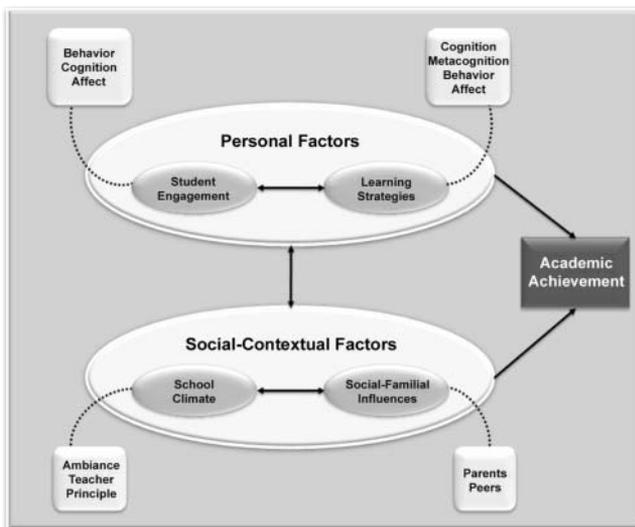


FIGURE 1 An integrated framework of personal and social-contextual factors for academic achievement.

factors exert a greater influence on personal factors (e.g., parents' influence on their children's learning) than vice versa, it is also possible that individuals' personal factors can change the dynamics in social-contextual factors (e.g., a child attaining good or improved grades can increase parents' expectations and aspirations for the child, which are positively associated with school achievement; see Fan & Chen, 2001). Ultimately, we argue that the personal and social-contextual factors, independently and together, influence academic achievement.

A traditional social-cognitive perspective highlights personal and social-contextual factors as salient components that lead to motivation and achievement (e.g., Bandura, 1997). At the core of the theory is the mediating role of self-regulation processes, linking personal and social-contextual factors with outcome measures. Our framework differs from this traditional social-cognitive perspective in that we consider one's self-regulation and metacognitive processes to be integral parts of the personal factor. This is based on our view (as well as that of contemporary psychologists') that one's self-regulatory processes cannot be fully separated from one's motivation, cognition, affect, and behaviors. Throughout the present article, we posit an integrated perspective that cognition, motivation, affect, and behaviors work together to produce desirable outcomes.

We now focus on each of the major four constructs in our proposed framework (i.e., student engagement, learning strategy use, school climate, and social-familial influences) and present their definitions and empirical findings relative to K-12 academic achievement.

PERSONAL FACTORS AND K-12 ACADEMIC ACHIEVEMENT

Student Engagement

Indicators of Student Engagement

Since the 1990s, a construct called "student engagement" has captured much attention from educators and educational researchers. Conceptually, it is similar to the motivation construct. Both terms are often used as an overarching category involving multiple psychological dimensions. Whereas the traditional notion of motivation emphasizes one's cognition through goal-orientation or willingness to work hard, the concept of student engagement highlights the behavioral (e.g., what students actually *do* in the classroom) and affective (e.g., how students *feel* when they go to school in the morning) components of student learning. Different researchers have elaborated on this notion of student engagement to explicate domain-specific outcomes (e.g., reading engagement, Guthrie & Wigfield, 2000; social engagement, Lutz, Guthrie, & Davis, 2006) or to explain learning processes (e.g., metacognitive engagement, Dole & Sinatra, 1998; academic engagement, Finn & Pannozzo, 2004). For instance,

Dole and Sinatra (1998) asserted that individuals can employ low cognitive engagement or high metacognitive engagement when processing information toward conceptual change.

Among the many studies presenting the engagement concept, Fredricks et al.'s (2004) framework seems most relevant to K-12 academic achievement. They noted that student engagement is typically and loosely defined as commitment or involvement. This broad definition, however, could potentially obscure important issues relating to student engagement (see Fredricks et al., 2004, p. 60). That motivated Fredricks et al. to focus on three types of student engagement; behavioral, cognitive, and emotional.

Behavioral engagement refers to students' external behaviors indicative of their interest and investment in learning activities. These behaviors can be observed by others in the classroom, and as part of various school or learning activities (Finn & Pannozzo, 2004; Fredricks et al., 2004). Individuals' level of engagement can be placed on a low to high continuum (e.g., Dole & Sinatra, 1998). Specific types of behavioral engagement relating to academia start with the behaviors of following school rules, arriving at school on time, not skipping classes, turning in homework on time,¹ and avoiding fights (Finn & Rock, 1997; Fredricks et al., 2004). Students displaying a more moderate level of engagement would work hard for good grades, pay attention in class, seek information on one's own, and attempt to surmount difficulties (Fincham, Hokoda, & Sanders, 1989; Finn & Cox, 1992; Finn & Rock, 1997; Fredricks et al., 2004; Skinner, Wellborn, & Connell, 1990). Behaviors that are indicators of the highest level of engagement include students' initiating discussions with teachers and other students on the materials that they learn in school, participating in school governance, joining the school's extracurricular activities such as book clubs, and taking part in learning activities outside of school (Fredricks & Eccles, 2006).

Cognitive-motivational engagement involves students' decisions, beliefs, and willingness to expand their efforts to learn and overcome challenging situations (Bandura, 1997; Fredricks et al., 2004). Cognitive-motivational engagement is demonstrated, for example, by a student's decision to put extra effort into his or her school work, and the internal and external articulation of personal beliefs and expectations with regard to school achievement. In addition, cognitive-motivational engagement may be characterized by students showing a preference for challenging work, persisting in the face of failure, and having a more internal focus toward learning

¹ We acknowledge that homework completion conceptually belongs to both student engagement and learning strategy categories. One can argue that completing homework is an important indicator of student engagement especially for younger students. Our categorization of this variable is based on a practical issue—whether we promote homework completion as an indicator of engagement or as a learning strategy. Because we believe homework completion as a strategy has more practical importance than as an engagement variable, we include this variable under the learning strategy category in our article.

beyond the desire to just attain good grades (Bandura, 1997; Fredricks et al., 2004; Newmann, Wehlage, & Lamborn, 1992; Patrick, Ryan, & Kaplan, 2007). Key cognitive-motivational engagement constructs that are particularly relevant for students' academic achievement include self-concept (Carr, Borkowski, & Maxwell, 1991), self-efficacy (Bandura, 1997; Chen & Zimmerman, 2007), self-discipline (Duckworth & Seligman, 2005; Wolters, 1999), attribution for success/failure (Borkowski, Weyhing, & Carr, 1988; Carr et al., 1991; Weiner, 2004), goal orientation (Walls & Little, 2005), and outcome expectancies (Wigfield & Eccles, 2002).

Emotional engagement refers to a student's affective reactions and feelings toward learning in general, as well as toward school, teachers, and classmates (Alexander, Entwisle, & Dauber, 1993; Fredricks et al., 2004). Students' emotional engagement is expressed by positive (e.g., happiness, enthusiasm, curiosity) or negative (e.g., boredom, anxiety) feelings in response to school and learning in general (Alexander et al., 1993; Fincham et al., 1989; Fredricks et al., 2004). Feeling proud of one's academic accomplishments, as well as a sense of belonging or identification with the school, are also considered important indicators of emotional engagement (Voelkl, 1997). Table 1 presents a summary of constructs for behavioral, cognitive, and emotional engagement.

Links to Academic Achievement

As noted earlier, the construct of student engagement as a composite (composed of behavioral, cognitive, and emotional aspects of learning) has emerged relatively recently in the literature, circa early 1990s. Since then, a number of studies have shown that academic achievement is strongly associated with certain aspects of student engagement. As indicators of student engagement, several specific constructs have been given much attention in relation to academic achievement (e.g., student attendance and class participation, Voelkl, 1997; enthusiasm and interest in learning, Alexander et al., 1993; Fincham et al., 1989; motivation, Martin & Dowson, 2009). In this section, we present studies that have employed the more composite or global definition of student engagement and showed strong ties between student engagement and academic achievement.

Evidence from longitudinal studies. Three major studies have employed longitudinal data to examine the long-term effects of student engagement on academic achievement (i.e., Alexander et al., 1993; Fincham et al., 1989; Voelkl, 1997). First, in the study by Alexander et al. (1993), teachers used a survey from Wave 1 (1976–1977) of National Survey of Children project (a three-wave longitudinal study carried out by the Foundation for Children Development and Child Trends, Inc.) to rate first-grade students' engagement in the classroom ($N = 790$). The student engagement dimensions that were measured involved both behavioral and emotional aspects of engagement, and included restlessness

(e.g., fidgets all the time, cannot sit still) and interest (e.g., enthusiastic, interested in a lot of different things, likes to express ideas). This study showed that the first graders' academic engagement behaviors predicted their academic achievement 3 years later (i.e., at Grade 4), as measured by the California Achievement Tests of reading (CAT-R) and mathematics (CAT-M), after controlling for race, gender, parental education level, family economic level, and students' CAT-R and CAT-M scores from the first grade (the adjusted $R^2 = .48$ for reading; and the adjusted $R^2 = .56$ for mathematics). This study suggests a lasting association between students' engagement behaviors and their academic achievement.

Another longitudinal study (Fincham et al., 1989) demonstrated that students' academic engagement measured at Grade 3 was significantly related to their academic achievement at Grade 5 ($N = 108$). Students' academic achievement was measured by the Stanford Achievement Test. Students' self-reports and teachers' ratings were employed to measure students' academic engagement. The indicators of student engagement used in this study were cognitive and emotional aspects of engagement, such as whether students attributed their success or failure to ability versus effort, expected to do well and finish assignments, preferred challenging work over easier tasks, asked for help when necessary, showed enthusiasm and persistence, and were proud when receiving good grades. Results from the study showed that several engagement measures were associated with reading and mathematics achievement. For instance, teacher ratings of students' learned helplessness at Grade 3 showed significant, negative path coefficients for reading ($\beta = -.41$) and mathematics ($\beta = -.32$) scores at Grade 5, when controlling for the students' Grade 3 achievement scores. In addition, teacher ratings of students on an ability-effort scale measured at Grade 3, showed a significant, positive path coefficient ($\beta = .30$) with reading scores at Grade 5 while controlling for the students' Grade 3 achievement scores.

Voelkl (1997) examined the relationship between academic achievement (in reading, language arts, mathematics, science, and social science) and student engagement measures. Academic achievement was measured by the Comprehensive Test of Basic Skills (CTB/Macmillan/McGraw-Hill, 1990), and student engagement was assessed by (a) self-report on the scale of "identification with school" and (b) teacher ratings on Student Participation Questionnaires (Finn, Folger, & Cox, 1991). Results from the study showed that students' Comprehensive Test of Basic Skills scores at Grade 4 ($N = 1,335$) were significantly related to the teacher ratings of student participation at Grade 8 ($r = .40$ for White students, $r = .43$ for African American students; $p < .01$). This association indicates that academic achievement continues to relate to school engagement 4 years later.

Evidence from large-scale assessments. The importance of student engagement has also been documented in large-scale assessments such as the National Assessment

of Educational Progress (NAEP; Campbell, Voelkl, & Donahue, 1997), Early Childhood Longitudinal Study (Finn & Pannozzo, 2004), and the National Education Longitudinal Study of 1988 (NELS: 88; Finn, 2006; Finn & Rock, 1997). In the NAEP project, reading engagement of students at ages 9 ($N = 5,414$), 13 ($N = 5,658$), and 17 ($N = 3,539$) was measured by four student-reading-related activities: (a) borrowing books from the library, (b) talking with friends about books, (c) buying books, and (d) reading more than one book by an author they liked. Students answered whether they had been engaged in any of these reading activities. The results showed striking differences in NAEP reading assessment scores between the highest engaged group (i.e., those who reported having done all four reading activities) and the lowest engaged group (i.e., those who reported having done zero or one reading activity): a 15-point difference for students aged 9, and about 36- to 37-point differences for students aged 13 and 17 (Campbell et al., 1997). In short, strong associations between reading engagement and reading scores were found within all three age groups.

Finn and Rock (1997) focused on lower income students in their secondary analyses of data from the NELS: 88. They reported a strong relationship between student engagement (measured by student self-reports and teacher ratings) and academic achievement. Based on NELS: 88 achievement test scores in reading and mathematics, and grade point averages (GPAs), students in Grades 8 to 12 ($N = 1,803$) were divided into three groups: (a) resilient completers (i.e., students who finished high school on time, had passing grades, and showed "reasonable" scores on standardized tests), (b) nonresilient completers (i.e., students who finished high school on time, but with poor academic performance), and (c) dropouts (i.e., students who did not finish high school). Findings showed that there were significant differences between the resilient and nonresilient student groups (after controlling for family structure and SES) in terms of students' engagement indicators (e.g., working hard, being prepared, attending school, and participating extracurricular activities). Similarly, significant differences were reported between nonresilient completers and dropouts.

Precursors to student engagement. A number of studies have examined whether social-contextual and psychological variables enable students' academic engagement. For example, social context (i.e., positive influences from parents, teachers, and peers) and self-related constructs appear to be the most frequently explored enablers of student engagement (Connell, Spencer, & Aber, 1994; Skinner et al., 1990). To illustrate, Connell and colleagues (1994) claimed that perceived parental involvement impacts students' self-efficacy, self-esteem, and responsibility and that those personal variables play a significant role in the development of students' academic engagement. In a similar study, Skinner et al. (1990) reported that teacher involvement as a social context and students' perceived self-control are pre-

cursors to academic engagement. In their path analysis, students' perceived self-control was directly linked to student engagement measures derived from teacher ratings. Student engagement showed a significant, positive link to academic performance as measured by the Stanford Achievement Test on reading and mathematics (the standardized path coefficient = .31, $p < .001$).

Students' prior academic achievement is another important precursor to student engagement (Finn & Cox, 1992; Voelkl, 1997). For instance, academic achievement measured at Grades 1 and 3 was found to be positively related to student engagement at Grade 4 (Finn & Cox, 1992), and academic achievement at Grade 4 was shown to be related to student engagement at Grade 8 (Voelkl, 1997). Shouse, Schneider, and Plank (1992), using NELS: 88 data, similarly reported that academic achievement can distinguish students' level of school engagement. That is, test scores and grades were significant predictors of students' academic engagement, as measured by teacher ratings on students performing below their abilities, completing homework, and staying attentive in class. No significant differences were found in relation to students' school engagement as a function of gender, family structure, family income, parental education level, and school type (Shouse et al., 1992). Although in this article we emphasize factors influencing academic achievement, it seems plausible that there may also be a reverse relationship (i.e., academic achievement influencing student engagement).

Learning Strategies

Indicators of Learning Strategies

Learning strategies have traditionally been conceptualized as a combination of cognitive and metacognitive processes. However, some research has suggested a more comprehensive view of learning strategies, including not only the traditional roles of cognition and metacognition but also the influences of affect, motivation, and behavior. For instance, Borkowski and his colleagues (Borkowski, Johnston, & Reid, 1986; Borkowski & Krause, 1985) studied motivational constructs (e.g., attributional beliefs, self-efficacy, self-regulation, and motivation), which have emerged as agents to internalize, activate, and execute one's own learning strategies (Schwinger, Steinmayr, & Spinath, 2009). Additional research findings have shown that students' motivational strategies can predict their use of other learning strategies (e.g., Wolters, 1999).

Over the years, different taxonomies of learning strategies have been proposed. Generally, they have been subdivided as (a) cognitive, metacognitive, and resource management strategies (Pokay & Blumenfeld, 1990); (b) cognitive, metacognitive, and motivational skills (Mayer, 1998); and (c) cognitive regulation and volitional control (Pintrich & DeGroot, 1990). Drawing from the earlier taxonomies, we view learning strategies as composed of four

main components: cognitive, metacognitive, motivational, and behavioral strategies. Because the constructs subsumed under the motivational learning strategies are essentially the same as those under cognitive-motivational engagement (discussed previously in this article), we now focus on the remaining three components—cognitive, metacognitive, and behavioral.

Cognitive strategies refer to skills that support learners as they develop internal procedures that enable them to perform complex tasks (e.g., Rosenshine, 1997). A few examples of cognitive strategies include summarizing, inferring, applying, and reasoning (Hattie, Biggs, & Purdie, 1996; Mayer, 1998; Robins & Mayer, 1993). The research that we reviewed points to several cognitive strategies as particularly relevant for students' academic outcomes in K–12 settings: (a) reviewing (Hong, Sas, & Sas, 2006), (b) rehearsing (Pintrich & DeGroot, 1990; Wolters 1999), (c) organizing (Eshel & Kohavi, 2003), and (d) elaborating/translating (Pintrich & DeGroot, 1990).

Metacognitive strategies relate to the abilities of learners to acknowledge, monitor, and evaluate their own cognitive processes as well as their strengths and weaknesses as learners. In this context, metacognition represents conditional knowledge about when, where, why, and how to use specific strategies in cognitive tasks (Hattie et al., 1996). Strategies to improve metacognitive skills typically involve four major procedural components: (a) knowing and monitoring one's own mental processes, (b) regulating learning activities, (c) reviewing what has been accomplished, and (d) evaluating how the remaining tasks can be accomplished (Cardelle-Elawar, 1992). Some metacognitive strategies tend to be task specific. For instance, knowing what students read and transferring ideas from previous reading are useful metacognitive strategies for reading comprehension (Mayer, 1998); planning and reviewing are essential strategies for writing (Hayes & Flower, 1986) and being aware of and monitoring the plans for solving a problem are fundamental metacognitive strategies for mathematics (Lewis, 1989). Other metacognitive strategies cut across subject areas, such as (a) knowing one's mental processes (Cardelle-Elawar, 1992), (b) planning objectives and monitoring progress (Wolters, 1999), (c) regulating cognitive strategies (Carr et al., 1991), (d) integrating new pieces of information into coherent knowledge representations (Cardelle-Elawar 1992), and (e) evaluating learning progress and skills (Hong et al., 2006).

Behavioral learning strategies refer to habitual activities that students employ during learning to manage and control their own behavior (e.g., through effort, volition, or habits), the behavior of others (e.g., through seeking help), and resources (e.g., places to study; e.g., Pokay & Blumenfeld, 1990). Specific behavioral strategies that have been linked to K–12 students' academic achievement include time management (Claessens, van Eerde, Rutte, & Roe, 2007; Cooper, Jackson, Nye, & Lindsay, 2001; Hong et al., 2006; Smith, 1992), test-taking strategies (e.g., A. D. Cohen,

2006; Hong et al., 2006; Pintrich & DeGroot, 1990; Samson, 1985), help seeking (Cooper et al., 2001; Hong et al., 2006; Newman & Schwager, 1995), homework management (Cool & Keith, 1991; Cooper et al., 2001, Cooper, Robinson, & Patall, 2006), and note-taking skills (Kobayashi, 2006). Definitions for these specific behavioral learning strategies are included in a later section of this article where the empirical findings are discussed in relation to each of these variables.

Links to Academic Achievement

Studies have shown that students' reported use of different types of learning strategies are significantly related to their academic performance. In this section we illustrate only studies directly related to the focus of this review: showing strong empirical links to reading and mathematics achievement of K–12 students. We now turn to the specific empirical findings supporting this argument.

Cognitive strategies and academic achievement. A number of studies have demonstrated the importance of cognitive strategies, especially organization, rehearsal, and elaboration skills, in school achievement. Eshel and Kohavi (2003), for example, showed positive relationships between cognitive strategies and mathematics performance among 6th-grade students. This study focused on organization and rehearsal aspects of cognitive strategies and showed positive correlations with mathematics achievement scores summed across Grades 4, 5, and 6 ($r = .24$, $p < .01$, $N = 320$). Another study (Pintrich & DeGroot, 1990) reported that the cognitive strategies of rehearsal, elaboration (through summarizing and paraphrasing), and organization were significantly related to reading and science achievement of students in the 7th grade ($r = .20$ averaging across scores on exams, reports, and grades, $p < .01$, $N = 173$). Finally, Wolters (1999) reported a strong correlation between rehearsal and student learning in Grades 9 and 10. That is, students' reported use of rehearsal strategies correlated significantly with students' GPA ($r = .30$, $p < .01$, $N = 88$). This correlation was higher than correlations among other motivational and behavioral strategies with student GPA: interest enhancement strategies ($r = -.16$, *ns*), environmental control ($r = .03$, *ns*), and effort ($r = .20$, *ns*).

Metacognitive strategies and academic achievement. Empirical studies have demonstrated strong links between metacognitive abilities and students' academic achievement. In a study by Carr et al. (1991), a path analysis showed a direct link between reading achievement and metacognitive strategies, which consisted of evaluation, planning, regulation, and conditional knowledge (the standardized path coefficient = $.16$, $p < .01$, $N = 200$). Wolters (1999) demonstrated that metacognitive strategies are indirectly but significantly related to academic performance: regulation ($r = .44$, $p < .001$), planning ($r = .35$, $p <$

.001), and monitoring ($r = .27, p < .01$) were all correlated with a motivational measure, which in turn predicted high school students' overall semester GPA ($r = .26, p < .01, N = 88$). An influential article by Pintrich and DeGroot (1990) also highlighted the role of metacognitive strategies in academic achievement. They noted that the association of metacognitive strategies to academic performance is actually stronger than that of motivational variables, such as values, self-efficacy, and anxiety. In their study, self-regulation was measured by items assessing metacognitive strategies (e.g., planning, skimming, and monitoring comprehension) and effort management (e.g., persistence and carefulness). They found that self-regulation was significantly correlated with academic performance, as measured by homework completion and a self-report questionnaire ($r = .36, p < .001, N = 173$). Other correlations involving academic performance with motivational variables were not as high: text anxiety ($r = -.14, ns$), self-efficacy ($r = .25, p < .01$), and intrinsic values ($r = .27, p < .01$).

Additional evidence of a relationship between metacognition and academic achievement was reported by Cardelle-Elawar (1992). In this study, lower ability sixth-grade students in an experimental group received metacognitive instruction, which involved stimulating and redirecting students' mental processes, introducing explicit discussion between teachers and students, and providing feedback tailored to individual students. The control group was drawn from another school that had the same characteristics in terms of population composition and curriculum emphasis. The study reported significant pretest–posttest differences on mathematics achievement tests between the experimental ($n = 60$) and control ($n = 30$) groups, $F(1, 88) = 312, MSE = 3.34, p < .001$.

Behavioral strategies and academic achievement. Behavioral learning strategies are measured by the extent to which learners are able to manage their own action, motivation, affect, and environment including people surrounding them. Thus far, the literature has not used the term *behavioral strategies*, so we have selected and assembled several behavioral constructs composing this category. We suggest that (a) time management, (b) test-taking strategies, (c) help seeking, (d) homework management, and (e) note-taking skills are particularly relevant behavioral learning strategies for students in grades K–12. The following section illustrates empirical findings on the relationships of each of these behavioral strategies to academic achievement along with brief definitions of each of the constructs.

Time management. Time management is viewed as the behaviors directed toward effective use of time to maximize productivity and to meet the goals for a particular task (Claessens et al., 2007). It is often conceptualized as having the main components of assessing, planning, and monitoring (Claessens et al., 2007). Others view it as setting goals,

using time management tools, and preferring organization (Macan, 1994), or as short-range planning, time attitudes, and long-range planning (Britton & Tesser, 1991).

Research has shown that the way in which school-aged children spend their time outside of school has significant implications for their academic achievement. After-school time for school-aged children is often categorized as time spent on homework, on chores, with parents, with friends, watching television, listening to music, engaging in leisure reading (Posner & Vandell, 1999; Smith, 1992), as well as social networking and using other digital media (Ito et al., 2008). In Smith's study, time spent on household chores ($\beta = -.22, p < .05$), listening to the radio and music ($\beta = -.18, p < .05$), and talking to and hanging out with friends ($\beta = -.14, p < .05$) were negatively associated with reading achievement among middle-school students (in Grades 7–9, $N = 1,584$). Similarly, Cooper et al. (2001) reported negative associations of students' final grades with their time alone ($r = -.14, p < .05$) and time spent watching television ($r = -.14, p < .05$) for students in Grades 2 to 4 ($N = 428$). In a more recent study by Liu, Rijmen, MacCann, and Roberts (2009), middle school students' time management scores (measured by components of being organized, meeting deadlines for homework, planning, and use of aids to manage time) were significantly related to grades on reading/language arts, mathematics, science, and social studies ($N = 814, r = .34-.37, p < .01$).

Test-taking strategies. The development of good test-taking strategies is another way to maximize students' school outcome, although test-taking strategy research has not yet derived a unified framework (see A. D. Cohen, 2006, for a more in-depth review on test-taking strategies). In relation to students' preparation for tests, three stages of test-taking strategies have been emphasized in the literature (Hong et al., 2006): (a) test-preparation strategies, (b) test-preparation awareness, and (c) actual test-taking strategies. Test-preparation strategies involve the control of one's cognitive functioning, managing the work environment, and regulating one's own motivation and effort levels. Test-preparation awareness includes knowledge of one's own study habits, past achievements, and personal beliefs, as well as the ability to recognize one's anxiety and motivational problems that may arise during tests. Actual test-taking strategies relate to remembering the material covered in class or textbooks, checking answers for mistakes, identifying and eliminating wrong answers, using memory aids, identifying item difficulty, and assessing and allocating testing time.

A meta-analysis combining 24 published studies (Samson, 1985) examined the effects of instructing test-taking strategies on academic achievement. An overall effect size of .33 was reported, with the general conclusion of the positive effect of test-taking skills on academic achievement. The study also reported that these effects were found across all grade levels (preschool, kindergarten, elementary,

and secondary schools), for all types of achievement measures (standardized, modified standardized, and classroom tests), across various subjects (reading, mathematics, English composition, and social science), and for different types of test-taking strategy training (e.g., general test-taking skills and motivation training).

Help seeking. Students' help-seeking behaviors were previously viewed as signs of weakness related to incompetence, immaturity, or overdependence on others. However, contemporary researchers view help seeking as beneficial or sometimes necessary to a positive learning process. An adaptive form of help seeking (i.e., students seeking help when it is necessary) has been linked to motivation, self-regulation/metacognition, and emotional well-being (Newman, 2008). It can be broadly construed as a motivational construct, indicative of students' desire and determination to learn the best way they can.

Several motivational constructs, such as self-efficacy, mastery-goal orientation, and interest, appear to be moderately and positively related to help-seeking behavior (Linnenbrink, 2005). Help seeking is also closely linked to metacognition and self-regulation in the sense that only the students who know what they know and what they can and cannot do regarding a given task are likely to seek help. Thus, it is a self-directed and adaptive learning process (Marchand & Skinner, 2007; Newman & Schwager, 1995). Emotional aspects also seem to play a role in engaging in help seeking as the constructs of relatedness, perceived competency, and emotional engagement have been associated with elementary and middle school students' willingness to ask for help (Marchand & Skinner, 2007).

Empirical findings suggest a positive relationship between help-seeking behaviors and academic achievement of young children. In a study by Newman and Goldin (1990), moderately sized correlations involving the variable *reluctance-to-ask-questions* were found in relation to reading and mathematics test scores ($r = -.47$, $p < .05$ for reading; $r = -.34$, ns for mathematics; $n = 23$) among sixth graders. Slightly smaller correlations were reported for second graders and fourth graders ($r = -.36$, ns , $n = 20$; $r = -.21$, ns , $n = 22$ at each grade, but note the small sample size). In addition, Newman and Schwager (1995) reported a positive association between adaptive help seeking and problem-solving performance among sixth graders.

Homework management. Homework may be defined as "any task assigned by schoolteachers intended for students to carry out during nonschool hours" (Cooper et al., 2006, p. 1). This definition of homework includes assignments that are worked on in study halls, libraries, following classes, at home, or elsewhere (Cooper et al., 2006). Components of homework management include monitoring motivation, controlling moods, persisting when faced with challenging tasks, and completing the assignment in spite

of other competing tasks such as sports or watching television (Xu & Corno, 2003). Whether homework is beneficial to student learning remains a very controversial topic in education research. Most researchers on homework agree that the results of homework research are inconclusive and thus implications are unclear (Bempechat, 2004). Part of the controversy results from when/where homework activities occur (i.e., out of regular school time and mostly at home), which implies that students who have (a) access to better resources, and (b) parents who have more time to assist would likely perform better on homework assignments (Bempechat, 2004). However controversial the benefit(s) of homework may be, researchers note that homework *completion* has positive effects on student achievement (Cool & Keith, 1991; Cooper et al., 2006) and has an important long-term role in the development of achievement motivation (Bempechat, 2004).

A number of empirical studies conducted over the past decade examining associations between homework and academic achievement have shown mixed results. However, a recent meta-analytic study summarizing homework research from 1987 to 2003 (Cooper et al., 2006) supported a general positive relationship between homework and academic achievement among school-aged students. Based on nearly 70 correlations from 32 studies, the mean weighted correlations were 0.24 using a fixed-error model and 0.16 using a random-error model. The *d*-index (i.e., standardized mean difference) ranged from 0.39 to 0.97 with the mean *d*-index (an average effect size across studies) of 0.60. In general, the effect sizes were stronger in upper grades (i.e., Grades 7–12) than in lower grades (kindergarten to Grade 6) and in studies where student reports were used rather than parent reports. In addition, studies employing structural equation modeling demonstrated a direct link between homework completion and academic achievement. For instance, in Keith, Diamond-Hallam, and Goldenring-Fine's (2004) study using data from the NELS: 88 (Grade 8, 1990; Grades 10 and 12, 1992; Grade 12; $N = 13,546$), the amount of time spent doing homework at Grades 10 and 12 was directly linked to high school GPA at Grade 12 (i.e., combined measure of grades from English, mathematics, science, and social science), with a standardized path coefficient of $\beta = 0.28$. A similar result on the relationship between homework completion and semester final grades was reported by Cooper et al. (2001) for students in Grades 2 to 4 ($\beta = 0.20$, $p < .05$).

Note-taking skills. Note-taking skills require students to concentrate during lectures and to coordinate multiple cognitive functions such as writing down, listening, and reading (Kobayashi, 2006). The literature indicates that note taking is not only an effective learning strategy but also the most common practice of students during class (Kobayashi, 2006). Students of all ages generally believe that note taking is useful and necessary for their learning (Faber, Morris, & Lieberman, 2000). The benefits of note taking have been linked to

students paying better attention to lectures (Van Meter, Yokoi, & Pressley, 1994), increasing their comprehension (Faber et al., 2000), and facilitating subsequent recall (Van Meter et al., 1994). Empirical studies have documented the importance of note-taking skills in relation to students' school outcomes (Faber et al., 2000; Hong et al., 2006; Peverly et al., 2007). An experimental study conducted by Farber et al. (2000) trained students for 9 weeks on note-taking skills (e.g., write down specific comments, recognize reading objectives, think about what is already known about the topic, skim through headings and subheadings, and formulate constructive questions). At the end of the experiment, students in the treatment group at Grade 9 ($N = 115$) demonstrated significantly higher scores on reading comprehension tests than the control group students who did not receive any note-taking instruction, $F(2, 110) = 5.88, p < .01$.

Summary of Personal Factors

Our literature review led us to select two major constructs—student engagement and learning strategies—as personal factors relating to students' academic achievement. Current research holds an integrated view on both constructs: Student engagement is characterized by behavioral, cognitive-motivational, and emotional components, and learning strategies include not only cognitive, metacognitive, and behavioral aspects (discussed in this article) but also affective and motivational components. Over the last two decades, a number of empirical studies have illustrated the importance of these constructs in academic performance of K–12 students. For student engagement, large-scale assessments and longitudinal studies have been employed, and for learning strategies, studies on a smaller scale are typically conducted but include experimental and intervention studies. Specific learning strategies have demonstrated empirical links to reading and mathematics achievement, including organization, rehearsal, and elaboration skills for cognitive strategies; planning, evaluation, self-regulation, and conditional knowledge (i.e., knowing when, where, and how to use a strategy) for metacognitive strategies; and time management, test-taking strategies, help seeking, homework completion, and note taking for behavioral strategies. We now examine the relationships among social-contextual factors and K–12 achievement.

SOCIAL-CONTEXTUAL FACTORS AND K–12 ACADEMIC ACHIEVEMENT

School Climate

Indicators of School Climate

In our PSCF framework shown in Figure 1, we have included two major categories of constructs (i.e., school climate and social-familial influences) under social-contextual fac-

tors that are believed to impact students' academic achievement. This section illustrates the school climate construct: its definition, subcomponents, and empirical links to students' reading and mathematics achievement.

School climate is defined as the organizational characteristics that are persistent in and unique to a particular school (Hoy, Tarter, & Bliss, 1990). The term *school climate* has been used interchangeably with other terms such as *school culture*, *school atmosphere*, *school environment*, *learning environment*, *sense of community*, and *academic climate* (Hoy & Hannum, 1997). Hoy and his colleagues (1990; Hoy & Hannum, 1997) have suggested subcomponents of school climate to be academic emphasis, teacher affiliation, collegial leadership, principal influence, and resource support. Others have highlighted different dimensions of school climate (e.g., community influences and school policies, class size, Public Policy Institute of California, 2002; demographics, Hanushek, Kain, Markman, & Rivkin, 2001), but we employ the conceptualization by Hoy and his colleagues in our school climate construct, mainly due to their underlying theme of the roles of motivation, affect, and cognition in shaping the climate of a particular school. Their conceptualization focuses on how students and teacher “feel” in the school (i.e., academic emphasis and collegial leadership), how teachers “feel” and “think” about their teaching and working with other colleagues in the school (i.e., teacher affiliation), and what the principal “thinks” and is “motivated” to do about the school's activities and vision (i.e., principal influences).

For our framework, we have used some of Hoy et al.'s school climate constructs and altered some aspects of their definition of the constructs. First, resource support is not discussed in our review, as our focus is an socio-contextual aspects of school climate. Second, we have broadened the teacher variables category to include additional variables beyond teacher affiliation. Third, we combine two of the principal characteristics—principal influence and collegial leadership—into a single category called “principal leadership” in our review. Thus our key school climate constructs are academic emphasis, teacher variables, and principal leadership. These components are defined and examined in the following section.

Links to Academic Achievement

Both the research and school communities generally agree that school climate creates and exemplifies a particular set of norms and values of a school. This climate, then, influences teaching and learning programs and practices within that school, and ultimately a variety of outcomes for school community members (Hoy & Hannum, 1997). This section focuses on a specific school climate outcome—student academic achievement—and examines its relation to students' exposure to a distinct school climate.

Academic emphasis. One of the critical elements of a positive school climate involves the perception—by students, parents, teachers, and school administrators—of the importance of academic achievement, a concept called “academic emphasis” (Hoy et al., 2002; Mullis et al., 2003). Academic emphasis is defined as the extent to which school communities (i.e., relevant stakeholders) share a common goal of improving students’ academic achievement (Hoy & Hannum, 1997; Hoy et al., 2002). In schools with a strong academic emphasis, academic achievement (rather than sports or other school activities) becomes a priority of students’ school life. In such environments, students tend to actively participate in class, work hard on homework, respect other students with good grades, work well with others, and understand the consequences of breaking school rules (Heck, Larsen, & Marcoulides, 1990; Hoy et al., 2002; Mullis et al., 2003). At the same time, teachers are likely to set high but reasonable goals for all students (Goddard, Hoy, & Hoy, 2000) and put forth extra time and effort for their students (Shouse, 1998). Some examples of survey items measuring academic emphasis include “The learning environment is orderly and serious” and “Students neglect to complete homework” (Hoy & Hannum, 1997).

Studies have shown that schools that place strong and clear emphasis on academics produce better student achievement in reading and mathematics compared to schools that do not have such an emphasis (e.g., Goddard et al., 2000; Hoy et al., 2002; Hoy et al., 1990). For example, Goddard et al. (2000) conducted a study involving 45 elementary schools. They examined students’ prior achievement and demographic variables as within-school independent variables, and showed that schools’ *academic emphasis* explained the between-school variability, about 47% in mathematics and 50% in reading (Goddard et al., 2000). In another study (Hoy & Hannum, 1997), schools’ emphasis on academics significantly predicted achievement in both reading ($\beta = .22, p < .05$) and mathematics ($\beta = .28, p < .01$) among middle-school students after controlling for school SES. Other studies have reported similar results (e.g., Hoy & Sabo, 1998; Hoy et al., 2002; Hoy, Tarter, & Kottkamp, 1991; Shouse, 1998). One study, conducted by Hoy et al. (1990), showed that only academic emphasis demonstrated a significant and unique contribution to student achievement ($\beta = .29, p < .01$) after controlling for 11 school climate factors including resource allocation, principal influence, teacher morale, supportive principal, engaged teachers, and closeness among faculty.

Teacher variables. What teachers do in the classroom and how they interact with students and other teachers can contribute significantly to a particular school climate. Characteristics of teachers in a positive school climate include being committed to and persistent about their students’ learning (Ware & Kitsantas, 2007), possessing high drive and self-confidence (Heck et al., 1990), and feeling good about their

teaching and about the professional support system provided to them (Shouse, 1998). In addition, positive feelings such as trust, collegiality, and closeness are likely to be shared among teachers (Uline, Miller, & Tschannen-Moran, 1998). The literature on school effectiveness has favored a group of teacher constructs that reflects an integrated perspective combining teachers’ motivation, affect, cognition, and metacognition. Such teacher constructs include (a) perceived collective efficacy (Bandura, 1997; Goddard, Logerfo, & Hoy, 2004; Ware & Kitsantas, 2007), (b) teacher empowerment (Sweetland & Hoy, 2000), and (c) teacher affiliation (Hoy & Hannum, 1997; Rosenholtz, 1989). Teachers’ *collective efficacy* refers to the extent to which teachers as a group share the belief that they have the power and capability to help students learn, to control instructional practices, and ultimately to make a difference in student achievement (Bandura, 1997; Ware & Kitsantas, 2007). Teachers with a strong sense of collective efficacy tend to expend great effort to accommodate individual students’ needs, have an optimistic outlook when facing obstacles, and take a personal responsibility for students’ achievement (Ware & Kitsantas, 2007). *Teacher empowerment* is defined as teachers’ belief that they play a critical role in schoolwide decisions, ranging from curriculum development to school operations (Sweetland & Hoy, 2000). This empowerment variable is also related to teachers’ level of participation in decision making, interest in decision making, and their job satisfaction (Rice & Schneider, 1994). *Teacher affiliation* is defined as teachers’ sense of belonging to the school in which they teach and has been shown to impact teachers’ commitment to their students, colleagues, and school (Hoy & Hannum, 1997). Such teachers tend to spend extra time and effort supporting their students’ learning, cooperate with other teachers, and show strong commitment to creating a better learning environment for students. At the core of each of these teacher constructs lies a set of beliefs, attitudes, knowledge, and affects, such as having a can-do attitude, knowing students’ strengths and weakness, believing in making positive changes in students’ lives, in addition to a host of motivational constructs such as commitment, persistence, and effort.

These teacher variables have been linked to students’ academic achievement (Goddard et al., 2000; Goddard et al., 2004; Hoy & Hannum, 1997). For instance, Hoy et al. (2002) showed that *teachers’ collective efficacy* was positively and strongly correlated with high school mathematics achievement ($r = .65, p < .01, N = 97$) when using school as the unit of analysis. Similarly, Goddard et al. (2004) found that teachers’ collective efficacy showed strong correlations with students’ achievement in various subject areas—reading, mathematics, science, social studies, and writing at both Grades 9 and 12 ($N = 96$). All correlations with teacher collective efficacy were significant ($p < .001$), ranging from .39 (writing scores at Grade 9), to .63 (mathematics scores at Grade 12). Evidence also suggest that *teacher empowerment* is strongly related to both reading ($r = .58, p < .01$) and

mathematics ($r = .58, p < .01$) achievement among middle school students ($N = 2,741$; Sweetland & Hoy, 2000). In relating components of school climate to reading, mathematics, and writing performance of middle school students ($N = 5,001$), Hoy and Hannum (1997) demonstrated the following results: *teacher affiliation* had moderately strong correlations with all three subject areas: reading ($r = .51, p < .01$), mathematics ($r = .53, p < .05$), and writing ($r = .51, p < .05$) achievement. Furthermore, the teacher affiliation variable significantly predicted academic outcomes after controlling for SES and other school climate variables: reading ($\beta = .17, p < .05$), mathematics ($\beta = .20, p < .01$), and writing ($\beta = .23, p < .05$). For writing achievement, teacher affiliation was the only significant positive predictor when all the other school climate and SES measures were included in the analysis.

Principal leadership. Similar to the teacher variables, the school climate literature has revealed that administrator characteristics are also important in terms of fostering student achievement. Among many administrator characteristics (e.g., number of years of teaching experiences, training, personal values), principal leadership has been consistently recognized as a critical construct linked to students' academic achievement (Hallinger et al., 1996; Leithwood & Mascall, 2008; Witzers, Bosker, & Kruger, 2003).

Principal leadership is defined as the principal's ability to influence the actions of school community members including teachers, parents, students, and district or state personnel (Hoy & Hannum, 1997). Current research on principal leadership has tended to focus on a principal's role as an instructional or transformational leader, especially in curriculum development, and the ability to create an academically oriented school climate (Leithwood & Jantzi, 1999). Specific characteristics of principal leadership include the ability to provide a coherent vision for school programs, foster discussion of curriculum issues, identify new missions and goals for the school, provide intellectual direction, convey high yet attainable expectations, acknowledge teachers' knowledge and skills, receive additional resources from superiors, recognize accomplishment of students and teachers, and provide an orderly learning environment with a clear set of discipline rules (Hallinger et al., 1996; Heck et al., 1990; Leithwood & Jantzi, 1999).

Principals' influences with regard to shaping, transforming, and/or maintaining the school climate and ultimately student achievement have been recognized in various empirical studies (e.g., Leithwood & Mascall, 2008; Witzers et al., 2003). For instance, in Hoy and Hannum's (1997) study with middle school students ($N \approx 5,000$), the correlation coefficients between principal leadership and student achievement were as follows: reading ($r = .28, p < .01$), mathematics ($r = .28, p < .01$), and writing ($r = .35, p < .01$). Similarly sized correlations are reported in Uline et al.'s (1998) study, where principal influence was examined from the perspective

of middle school teachers ($N = 86$), specifically with regard to their trust in their principal's integrity. Teachers' ratings of their trust in the principal's integrity were significantly correlated with students' standardized achievement data across subject areas: reading ($r = .30, p < .01$), mathematics ($r = .30, p < .01$), and writing ($r = .27, p < .05$). Witzers et al.'s (2003) meta-analysis, which included studies conducted between 1986 and 1996, concluded that there is a small but significant direct effect of principals' leadership on student achievement, with Cohen's $d = .20$.

Some studies have described causal links from principal variables to student achievement. Hallinger et al. (1996) presented a relationship between principals' instructional leadership and the clarity of a school's mission ($\beta = .35, p < .01$). The clarity of the school's mission is, in turn, related to students' opportunities to learn ($\beta = .67, p < .01$) and then to teachers' expectations ($\beta = .36, p < .01$), which ultimately relates to students' achievement. Heck et al. (1990) fitted their data into a structural equation model and showed direct effects from school climate ($\beta = .50, p < .01$) and instructional organization ($\beta = .53, p < .01$) to student achievement. Student achievement was measured by their reading and mathematics performance in relation to the California Assessment Program (State Department of Education). Principals' behaviors were assessed through their skills in school governance (i.e., providing vision and specific rules involving teachers, staff, students and parents), instructional organization (i.e., management of work structure for teachers and students), and enhancing school climate (i.e., school environment directed toward learning).

Other school climate variables. We acknowledge that the variables described in this section represent only a fraction of school-related variables that could create a positive school climate and hence better student outcomes. Other variables that pertain to schools' functionality may contribute to a particular school climate, such as having (a) appropriate space and sufficient resources; (b) an appropriately challenging curriculum aligned with state standards and standardized tests (American Federation of Teachers, 2001); and (c) attractive extracurricular activities (which may contribute to better student attendance). After-school programs, enrichment opportunities, and appropriate tutoring programs have also been identified as important school-climate variables (American Federation of Teachers, 2001). In addition, organizational and institutional structures may contribute to academic success, such as the school leadership structure (e.g., site-based decision making), teacher assignment patterns and policies (e.g., ensuring that the least experienced teachers are not assigned to the "worst" classes or most difficult classrooms), and administrator support from the district (e.g., obtaining important resources such as highly qualified teachers; Clotfelter, Ladd, & Vigdor, 2006). Although we recognize these variables are potentially important in relation to school climate, we have chosen to focus only on school climate variables that

are belief- and attitude-based and that show strong empirical relationships to reading and mathematics achievement at the K–12 level.

Social-Familial Influences

Indicators of Social-Familial Influences

The last component of our PSCF framework involves social-familial influences. Among the many social-familial influences, we pay special attention to parental and peer variables, recognizing the critical roles of parents and peers relative to students' lives in and outside of school. For example, parents' attitudes toward education and their child-rearing philosophies can influence schools' decisions on instructional programs and policies, and ultimately affect their child's education and attitudes (Hallinger et al., 1996). Among the many aspects of parents' child-rearing practice, the construct of "parental involvement" has been most studied in relation their children's education. Few studies operationalize this construct the same way; consequently differences in its definition make it hard to assess cumulative knowledge across studies. However, there seems to be three major prevalent facets of parental involvement: *attitudinal* components, such as aspirations or expectations for the child's educational success; *behavioral* aspects, such as parents' assistance with homework or attendance at parent-teacher meetings; and *stylistic* components, such as parenting style or family interaction patterns. Specifically, the aspects of the parental involvement that have been previously noted as important in K–12 education include (a) parents' high yet reasonable expectations and aspirations for their child; (b) parents' participation in their child's school events (such as Parent Teacher Association [PTA] meetings, field trips, fundraising, volunteer work, or community service); (c) monitoring their child's homework and providing home supervision and rules; (d) discussion about school work and post-high school plans; (e) arranging for community resources for their children's learning; (f) parental modeling and support of the child's reading, as well as providing a stimulating literacy environment (Fan & Chen, 2001; Hill & Craft, 2003; Keith et al., 1993; Taylor, Clayton, & Rowley, 2004); and (g) authoritative, autonomy-promoting parenting style/practices (Baumrind, 1967), which reside midway between authoritarian and permissive parenting styles, (Lamborn, Mounts, Steinberg, & Dornbusch, 1991).

Attitudes, achievement, and perceived norms among peers in a school can also stimulate or discourage students' learning at school (Syvertsen et al., 2009). As with the literature on parental involvement, different definitions of "peers" exist in the literature (Ryan, 2001). Most of the differences relate to the size of the peer group, which has implications for its composition. A peer group can range from a single best friend, to a few close friends, to a slightly larger group of friends with relatively strong ties, to the entire age cohort (Brown, 1990). Urberg, Degirmencioglu, and Pilgrim (1997)

reported that students in Grades 6 through 12 considered their peer groups to consist of about five to eight students. In our review, we view peers as a group of friends who share common experiences at school (e.g., having the same teacher or attending the same school), not limited to a size of a peer group. Peers can share attitudes and beliefs and common behaviors with respect to school experiences and learning and other nonacademic activities. Peer norms as a group concept can influence individuals' attitudes and beliefs about school achievement, either directly through social reinforcement or indirectly through observation (Ryan, 2001).

Links to Academic Achievement

This section highlights some of the empirical studies that showed strong links between K–12 academic achievement and students' social-contextual environment with a focus on attitudes and behaviors of parents and peers with respect to school achievement.

Parental involvement. Describing the accumulated literature on parental involvement is outside the scope of the present article. Rather, we focus on empirical studies that have explored general attitudinal and behavioral components of parental involvement in relation to academic achievement. First, Fan, and Chen (2001) conducted a meta-analysis consisting of 25 empirical studies and 92 correlations. They found a medium effect size (r index = .25; $N = 133,577$) for a general indicator of parental involvement relative to students' academic achievement. When subcomponents of parental involvement were examined, the strongest correlation to academic achievement was shown by the parental *expectations/aspirations* variable ($r = .40$), which was larger than correlations with other aspects of parental involvement, such as home supervision ($r = .09$), communication ($r = .19$), and school participation ($r = .32$). Similarly, Keith et al. (1993) showed that the parental-aspiration variable was more strongly correlated with academic achievement ($r = .40$ with a standardized reading test, and $r = .42$ with a standardized mathematics test; $N = 21,814$) than other aspects of parental involvement, including communication ($r =$ about .20 for both reading and mathematics tests) and school participation ($r =$ about .10 for both reading and mathematics tests). Hill and Craft (2003) also reported that measures of parents' educational *values* were significantly correlated with reading achievement ($r = .48$, $p < .01$) and mathematics achievement ($r = .40$, $p < .01$) among White students ($n = 49$). Finally, Ma and Kishor's (1997) meta-analytic study synthesizing 143 studies demonstrated a weighted mean effect size of 0.14 between students' perceived parental support and mathematics achievement.

Measures of parents' *participation in school activities* also show consistent associations with their children's academic achievement. For example, parents' participation in PTA/PTO, community involvement or volunteer work has shown positive associations with reading ($r = .11$)

and mathematics ($r = .13$) achievement in the NELS: 88 ($N = 21,814$; Keith et al., 1993). Similar results have been reported elsewhere (e.g., Hill & Craft, 2003), where the correlation between parents' school involvement and mathematics achievement was reported to be around .36 ($p < .05$, $n = 54$). The relationship between students' academic achievement and parents' educational *activities at home*, however, has shown mixed results. Some studies report that parent participation in learning activities at home is positively associated with students' academic achievement ($r = .40$, $p < .001$ for reading achievement; $r = .32$, $p < .001$ for mathematics achievement; Izzo, Weissberg, Kaspro, & Fendrich, 1999), but other studies report no significant relations (e.g., Hill & Craft, 2003).

Peer influences. Some of the empirical studies directly relating peer influences to K–12 academic achievement are as follows. Gonzales, Cauce, Friedman, and Mason (1996) reported the results from a study with middle school African American students ($N = 120$). They measured peer support with a 28-item self-report questionnaire asking about students' attachments to peers and parents. Their results showed that *peer support* was a significant predictor of GPA ($\beta = .23$, $p < .05$). Other important variables were not predictive of GPA, such as family income, parent education, number of parents in the home, maternal support, and maternal control. The study concluded that peer and neighborhood contexts may have more powerful influences on students' academic achievement than family context variables, at least for African American students.

The effects of peer influences have also been examined in a national sample with data from the NAEP 1998 reading assessment. The peer attitude variable in NAEP was assessed via one item: "My friends make fun of people who try to do well in school." Johnson (2000) reported that fourth graders who agreed with this statement scored about 19 points *lower* on the 1998 NAEP reading test compared to the fourth graders who disagreed with the statement. This 19-point difference was about the size of the score difference between White and African American fourth graders on the NAEP: 88 reading test (Johnson, 2000). Finally, Ryan (2001) found that *peers' achievement* can influence other peers' achievement. That is, in two-level hierarchical linear modeling ($N = 331$), peer-group achievement (i.e., averaging the achievement scores of individual peer group members) in the fall predicted the difference in the change in the achievement score of the peer group ($\gamma = .56$, $p < .001$). Either through peer support and attitudes or through peer achievement, the influences from peers appears to be an important social context that should not be overlooked with respect to academic achievement.

Summary of Social-Contextual Factors

Our goal for this social-contextual section of the review was to highlight the literature relating to important social-

contextual factors that lead to school achievement. Due to different operational definitions of constructs and different research designs and analyses, it is impossible to directly compare the results of different studies. However, we were able to identify a number of influential social-contextual factors, such as school climate (e.g., the school's emphasis on academic achievement), teachers' attitudinal and motivational variables, and principals' leadership skills. We also examined parental and peer variables in terms of their relationships to academic achievement. Similarly to what we concluded with the personal factors, we found that at the core of the social-contextual factor lie people's attitudes, behaviors, motivations, and affect. This was manifested in the reviewed constructs of teachers' sense of affiliation, empowerment, perceived efficacy, parental involvement, and peers' perceived support and norms. We argue that there is a reciprocal relationship between social-contextual and personal factors and that both factors can play an important role in students' academic achievement (see Figure 1).

CONCLUSION

We have presented an integrated framework for K–12 students' academic achievement. Our framework reflects the current perspective in the fields of educational and social psychology that human behavior and learning involve the integration of motivation, cognition, and affective variables (e.g., Linnenbrink, 2006; Sinatra, 2005). Our particular view is that achievement is influenced by not only cognitive, or not just affective or motivational, or contextual factors, but all of these major factors working in concert. This view led us to highlight the following psychological constructs: (a) *student engagement*, which consists of behavioral, cognitive, and emotional components; (b) *learning strategies*, which involves cognition, metacognition, and behaviors; (c) *school climate*, which includes cognition, metacognition, motivation, and affect of school community members; and (d) *social-familial influences*, which can be exerted by motivation, affect, and behaviors of parents and peers.

We further classified the first two variables (engagement and learning strategies) as key components of the personal (within-student) factor, and the latter two (school climate and social-familial influences) as key parts of the social-contextual (outside-student) factor. However, this distinction of personal versus social-contextual factors can be blurry, as these two groups of factors are intertwined and influence each other. For instance, social-familial influences can shape students' engagement with schoolwork, and students' learning habits and strategies can be developed by a particular climate of a school. The classification that we have made (i.e., between the personal and social-contextual factors) is based on the degree to which a particular construct originates from within or outside of the student, and whether the student's locus of control likely resides internally or externally (e.g., his or her own behavior vs. social environment).

We also suggest that the relations between the key variables as well as between the main factors (personal and social-contextual) are bidirectional and reciprocal. For instance, students with high engagement tend to use a variety of learning strategies effectively, and vice versa—acquisition of effective learning strategies can motivate students to learn more about the task at hand. In other words, student motivation and strategy use are “interdependent processes that cannot be fully understood apart from each other” (Zimmerman, 1990, p. 6). We further argue that both personal and social-contextual factors, independently and interdependently, influence students’ academic achievement given the findings of the empirical studies reported herein. In sum, we claim that to achieve academic success, students should be engaged with learning—cognitively, affectively, and behaviorally. The mind engaged toward learning can adopt various strategies to maximize learning. Optimizing student learning, and hence academic achievement, is also believed to involve positive social-contextual influences that are generated by or obtained from factors outside of students themselves, likely from school, peers, parents, and teachers.

We acknowledge that some other personal and contextual variables that are likely to be linked to school achievement are left out of our review. For instance, among the student-level variables, demographic information (race, gender, family SES), personal educational experiences, prior education attainment or knowledge, cognitive abilities, aptitude, personality, or temperament are likely to be associated with achievement. Contextual variables that are pertinent but not reviewed include educational resources at home, sibling and neighborhood effects, access/opportunities to learn, the availability of good curricula or other educational programs, and classroom or instructional effects. Finally and broadly, societal and institutional factors such as social attitudes, values, beliefs, and cultural norms including gender-role socialization and stereotyping can also influence school achievement.

We certainly embrace an encompassing view of human behavior consisting of and influenced by multiple layers of not only motivational, cognitive, affective, and social-contextual factors (reviewed in this article) but also of situational, institutional, societal, and cultural factors that were left out of our review (cf. Stankov & Lee, 2009). However, covering all of these variables is beyond the scope of a single review article. Although we have not reviewed all possible personal and social-contextual variables related to school success, we have covered a broad set of important variables that are strongly related to school achievement, in a way that has not been compiled elsewhere.

Our goal in this review was not to unravel directional and causal relationships among the variables and factors (although we have depicted a directional link leading to academic achievement in our framework shown in Figure

1²). The relationships among variables discussed throughout this article are associative in nature. We also view that no particular variable is given precedence or more weight over other variables and suggest that the reviewed variables are all considered important in relation to understanding students’ academic achievement. Although it was not a focus of this article, disentangling the complex interrelationships among the personal and social-contextual factors does compose research worthy of pursuing. Future studies can also employ a meta-analysis approach to examine the relative importance and influence of the constructs in relation to student achievement.

Previous empirical studies (e.g., Alexander et al., 1993; Connell et al., 1994) have demonstrated possible directional relationships among some of the variables reviewed in this article. In Fincham et al.’s (1989) study, students’ gender was linked to cognitive and emotional engagement indicators along with test anxiety, which had significant links to academic achievement. In Alexander et al. (1993), student engagement indicators and demographic variables such as race, sex, parent education, and family SES were linked to students’ academic achievement. In Connell et al. (1994), several demographic variables were linked to student self-efficacy, perceived relatedness to self and others, and emotional and behavioral engagement, which were then associated with several school outcome measures. Unfortunately, these previous studies are somewhat disjointed from each other, making it difficult to build a framework. What we proposed in this article is a comprehensive framework including many major psychological constructs studied in relation to academic success in recent educational psychology literature. We take an integrated approach in that the key variables in our framework have multiple components of behaviors, affect, cognition, and motivation. We also recognize the reciprocal nature of relationships among the variables reviewed. In the future, directional links can be explored among the current set of variables, as well as including additional contextual variables mentioned in this section toward developing an even more comprehensive framework.

Building a conceptual framework and theorizing in terms of its constituent variables are activities of interest for the research community. But on a more practical level—What are the implications of our framework with regard to teachers, administrators, and parents? One benefit of our proposed framework is that it consists of four relatively narrow constructs (e.g., learning strategies and student engagement),

²We acknowledge that it is also likely to observe reverse directional influences—from students’ achievement to personal and social-contextual factors. For instance, students’ improved achievement could lead to heightened engagement and affect parental involvement in their child’s learning. However, we use a directional link to present our case of identifying factors impacting student achievement. We do not intend to imply causality in our framework.

and the four major constructs have their own subcomponents of cognition, behavior, affect, or metacognition (Figure 1). We suggest that each of the subcomponents within the major constructs can be used as the basis for specific intervention. For example, an intervention can be designed and developed to target *behavioral* aspects of student engagement or *metacognitive* aspects of learning strategies. By focusing on certain behavioral or attitudinal aspects of learners, teachers and parents will be able to identify problem areas in need of remediation rather than misattributing students' poor school performance to simply lack of knowledge or ability. In addition, interventions can also be targeted at influencing social-contextual factors (i.e., teachers, parents, and peers) to promote student learning.

Another implication that can be drawn from our integrated perspective is that there are factors outside of students' internal control and that teachers and parents should also be actively involved and highly engaged with their students' and children's learning because they exert crucial influences over students' learning outcomes. In this article we argue that it is the *interaction* of the factors (e.g., the influence of parental involvement on students' engagement) that would ultimately make a difference in student learning.

Our motivation for conducting this review was based on a simple observation. There seems to be more than one (or two) dominant factor(s) that can lead to positive school outcomes because we often observe that students with basic or above-average cognitive abilities perform below expectations and conversely, some students surprise teachers with performances that are better than what may be expected given their contextual environment. We argue that inside-student factors, such as behavior, affect, attitude, and motivation, as well as outside-student factors, such as various influences by parents, teachers, and peers, have to work together to produce the best learning outcomes for an individual student. By illustrating this point in this article, we have demonstrated a more integrative approach to understanding K–12 student learning. We hope that students, parents, teachers, and administrators would understand the importance of taking an integrated perspective relative to student learning, and we hope that we have shown the value of jointly considering personal and social-contextual factors in relation to K–12 academic achievement.

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