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ABSTRACT

Contextual perceptions, motivational beliefs, and achievements of 389 female high school students in Seoul, Korea were examined longitudinally during an academic year. Contextual perceptions and motivational beliefs were assessed within the contexts of general school learning and specific school subjects. Overall, personal motivation beliefs were more stable than contextual perceptions. Mastery goals and task-value demonstrated weak correlations across strong cross-domain correlations. Self-efficacy perceptions in different school subjects were moderately correlated. Construct relations were generally consistent across domains, measurement levels, and time. Achievement goals mediated effects of contextual perceptions on academic self-efficacy and school affect. Self-efficacy mediated effects of goals on achievement. Contextual perceptions demonstrated continued effects on personal motivation beyond the effects of previous motivation and achievement. (Contains 9 tables, 6 figures, and 55 references.) (Author/SLD)

Stability and Structure of Self-Efficacy, Task-Value, and Achievement Goals and Consistency of Their Relations Across Specific and General Academic Contexts and Across the School Year

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Abstract

Contextual perceptions, motivational beliefs, and achievements of high school students were examined longitudinally during an academic year. Contextual perceptions and motivational beliefs were assessed within the contexts of general school learning and specific school subjects. Overall, personal motivation beliefs were more stable than contextual perceptions. Mastery goals and task-value demonstrated weak correlations across subject areas, whereas performance-approach and performance-avoidance goals showed strong cross-domain correlations. Self-efficacy perceptions in different school subjects were moderately correlated. Construct relations were generally consistent across domains, measurement levels, and time. Achievement goals mediated effects of contextual perceptions on academic self-efficacy and school affect. Self-efficacy mediated effects of goals on achievement. Contextual perceptions demonstrated continued effects on personal motivation beyond the effects of previous motivation and achievement.

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Centrality of Self-Efficacy, Task-Value, and Achievement Goals in Academic Motivation Research

Recent developments in academic motivation research improved our understanding of what important motivational constructs are, how these beliefs and perceptions are created, and in what context each belief seems to be most critical in determining subsequent cognitive, affective, and behavioral outcomes. Among a host of motivational constructs, perceptions of self-efficacy, task-value, and achievement goals emerged as particularly useful in explaining and predicting students' achievement-related strivings. Academic self-efficacy refers to beliefs that one can successfully carry out given academic tasks at designated levels (Schunk, 1991). Task-value is defined as an incentive to engage in academic activities and represents a composite construct that encompasses perceived importance, usefulness, and interest (Wigfield & Eccles, 1992). These two belief systems have been very effective in predicting a variety of outcomes including task choice and performance (Eccles, Wigfield, Schiefele, 1998; Multon, Brown, & Lent, 1991).

Achievement goals refer to underlying purposes or reasons for engaging in achievement-oriented behaviors (Ames, 1984; Pintrich, 2000a; but see Harackiewicz & Elliot, 1993). Three distinct yet correlated goals have been found to guide student behaviors—mastery, performance-approach, and performance-avoidance goals (Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Skaalvik, 1997)[1]. Generally speaking, mastery- or task-oriented students are primarily concerned with improving their competence through task mastery. Students with performance-approach goals, though ostensibly similar to mastery-oriented students in their pursuit of academic excellence, express a strong desire to impress and outperform others, which is often the primary motivator of their engagement. Sometimes, the purposes of students' achievement-related behaviors are not to demonstrate their superiority but to conceal their relative incompetence. When this happens, students are viewed as performance-avoidance oriented. Like self-efficacy and task-value, achievement goals have been linked significantly to diverse indexes of motivation and learning (Elliot, 1999; Urdan, 1997).

Some Unresolved Issues

Internal Characteristics: Stability and Structure

Due to their conceptual appeal and practical utility, an increasing number of academic motivation studies turn to perceived self-efficacy, task-value, or achievement goals to explain varied outcomes. However, in contrast to the growing trend in analyzing how these constructs relate to each other and affect other variables, efforts to verifying their internal characteristics have been somewhat neglected. For example, whereas temporal stability and developmental trends of task-value perceptions have been actively dealt with (e.g., Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield et al., 1991; Wigfield et al., 1997), these issues largely remain unexplored with respect to self-efficacy and achievement goals. In the case of self-efficacy, highly context-specific nature of the construct and corresponding assessment procedures often preclude estimation of its test-retest reliability. Stability is also what the efficacy researchers are least interested in when they employ experimental manipulation (e.g., Bandura & Schunk, 1981; Schunk & Swartz, 1993; Schunk & Ertmer, 1999; Zimmerman & Kitsantas, 1999). Nevertheless, self-efficacy researchers agree that perceived efficacy, once established, demonstrates a certain degree of resilience to temporary disconfirming experiences (Bandura, 1997).

Not enough evidence exists on the temporal stability of achievement goals, either. Roedel, Schraw, and Plake (1994) reported test-retest coefficients of .73 and .76 for learning and performance goal orientations, respectively, for a sample of 171 undergraduate students. However, the assessment interval was only two weeks and the goal orientations were assessed only in reference to general academic learning. Elliot and McGregor (2001, Study 2) reported similar results, again with college undergraduates but within the context of an introductory psychology class. Mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance goals each demonstrated a stability coefficient of .73, .70, .74, and .71, respectively. In this study, achievement goals that were assessed 1 month and 2 months after their initial assessment were averaged to form the subsequent achievement goal measures. Therefore, it appears that achievement goals stay more or less steady at least among the college population within the two-month time frame. Whether younger students' achievement goals would demonstrate similar stability remains to be seen.

Between-domain relations of these motivational constructs have not been vigorously investigated for similar reason. In an effort to reflect the distinctiveness of motivational beliefs across different situations, researchers tend to assess constructs in reference to a single academic domain. Investigations on the cross-domain interrelations are relatively few. Weiner (1990) suspected that there would be little generality of academic motivation across domains. Limited empirical evidence suggests that these constructs are indeed highly domain-specific but the strengths of between-domain relations differ substantially by individual constructs (Bong, 2001a). Whereas self-efficacy perceptions in diverse subject areas tended to be moderately correlated, mastery goal and task-value perceptions were highly distinctive across academic subjects, particularly among high school students. In comparison, performance-approach orientations in different areas demonstrated strong intercorrelations, as did performance-avoidance goals. This held true for both middle and high school students.

Why, then, is the question of cross-domain generality important? There are at least three reasons, one practical and the other two more theoretical. First, without such evidence, generalizability of any observation is necessarily confined within the specific context that the data were collected. Because most academic motivation constructs are known to contain strong domain-specific components, generalizing findings beyond experimental contexts should be preceded by empirical evidence that it is sensible to do so. Second, evidence of this type could potentially substantiate a particular theoretical stance, especially within the achievement goal literature (see also Murphy & Alexander, 2000; Pintrich, 2000a). Specifically, strong correlations can be taken to support the view that achievement goals are personality dispositions that manifest themselves across different situations (e.g., Duda & Nicholls, 1992), although in this study, the "different" situations would be all classroom contexts of some sort. Weaker correlations, on the other hand, should reinforce the position that goals are underlying purposes of action that play out mainly in the person's interaction with specific contexts. This question is less relevant to the self-efficacy and task-value research because these two theories make explicit assumptions that these perceptions are inherently context-specific. Third, evidence on the between-domain associations of a construct helps develop its within-construct network. The present research aims to examine the temporal stability and dimensionality of these popular motivation constructs in hopes to produce better understanding of how these beliefs are organized and maintained.

Consistency of Relations Across Contexts and Over Time

As Murphy and Alexander (2000) also noted, another observable trend in academic motivation research is the co-existence of highly specific and more general approaches. In general, researchers are trying to account for the complex interplay among cognition, affect, and action within defined academic situations. Contemporary motivation research on the whole can thus be viewed as more specific than past research (Weiner, 1990). Nonetheless, some investigators tend to focus more on students' perceptions toward schooling in general, whereas others examine motivational processes under highly specified circumstances. This is reasonable, considering that motivation researchers are interested in both specific and general outcomes. Even so, because a majority of recent studies have been conducted within particular academic situations, generalizability of findings from one domain to the others is not always clear (Meece, 1994). On the same token, it is less than obvious whether findings from specific situations would be equally applicable to more general academic contexts and vice versa. For instance, although self-efficacy and task-value perceptions jointly determine performance and behavioral intentions (e.g., Meece, Wigfield, & Eccles, 1990), students might rely heavily on their perceived efficacy when deciding which tasks to perform and how much effort to invest in them under highly specific conditions. At more general levels, similar decisions might be more readily determined by future utility and importance of the task.

Among the three constructs that are being discussed as representative of the current academic motivation research, self-efficacy research has unquestionably been most context-specific. Studies on academic self-efficacy frequently involve particular problem-solving situations within a selected academic domain (e.g., Pajares & Graham, 1999; Pajares, Miller, & Johnson, 1999; Schunk, 1996). Nonetheless, perceived self-efficacy have also been assessed in reference to specific subject areas or general school learning when researchers attempt to predict more general-level outcomes (e.g., Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Zimmerman & Bandura, 1994). In expectancy-value research, the most commonly used measurement units have been specific activity domains with younger children (e.g., Eccles et al., 1993; Wigfield et al., 1997) and specific school subjects with older students (e.g., Wigfield et al., 1991). Achievement goal researchers seem to be more interested in students' goal orientations toward specific domains (e.g., Middleton & Midgley, 1997; Pintrich, 2000b) or school learning in general (Roeser, Midgley, & Urdan, 1996). Still, in studies where achievement goal orientation is experimentally manipulated (e.g., Elliot & Harackiewicz, 1996), it can be argued that the goal so induced is specific to the activity or context in question. In the present study, constructs were assessed at two different levels of specificity—specific school subjects and school learning in general. It was of interest to determine whether difference existed in the stability of perceptions and relations among constructs, depending on the domains of interest and levels of specificity.

Construct relations may also fluctuate over time. Strengths of motivational beliefs could change from the beginning to the end of the school year, as may the direction and strengths of influence among these beliefs (Bong, 1996). Pokay and Blumenfeld (1990), for example, tested whether the relations among academic motivation, use of learning strategies, and achievement would change as a function of time. They found that value and expectancy predicted strategy use early in the semester but that only value retained its direct effect on strategy use later in the semester. Whereas use of both geometry-specific and metacognitive strategies predicted geometry test grade early in the semester, only metacognitive strategy use sustained its predictive utility on later geometry test grades. Further, self-concept became a significant predictor of achievement only late in the semester. In the present investigation, relations among self-efficacy, task-value, achievement goals, and performance were examined simultaneously at two different levels of specificity (or generality) as well as over time across the full academic year. Together with evidence on the internal structure of motivational beliefs, this type of evidence would allow making an informed decision regarding when and to where findings from a particular investigation could be safely generalized.

Perceptions of Contexts on Academic Motivation

Social cognitive theories of motivation posit reciprocal determinism between person, environment, and behavior (Bandura, 1986; Zimmerman, 1989). Consistent with this notion, investigators have identified several contextual variables, or subjective understandings of contexts, that play a significant role in shaping students' self- and task-related beliefs. Perceived school or classroom goal structures, teacher-student relationships, and parental expectations are some of the most commonly studied ones. These variables are shown to affect students' performance at school through their direct influence on not only students' self-efficacy and achievement goals but also students' affective reactions toward schooling or use of self-handicapping strategies (e.g., Roeser et al., 1996; Midgley & Urdan, 1995). Some of the questions posed in the present research regarding individual motivation constructs are also pertinent to these contextual variables. For example, how stable are these context-related perceptions? Are context-referenced beliefs less stable than self-referenced perceptions? Is there a difference in the stability of these beliefs depending on the level of generality in the referent target (e.g., school learning in general versus specific school subjects)? Are context-related perceptions influenced by achievement outcomes in similar ways to self-referenced beliefs?

Often, the direction of influence between the context and personal beliefs is assumed to be uni-directional such that contexts shape individual perceptions. However, given the constant interaction between the two classes of perceptions and their interaction with outcomes, it seems more plausible to make room for the role of self-referenced beliefs and performance outcomes in the construal of one's environment. The most logical way of testing this claim would be to assess variables longitudinally and examine whether motivation and performance variables from earlier measurement points affect contextual perceptions at later assessments. Such a design is also more consistent with the social cognitive views of human functioning. The longitudinal feature of the present investigation allows exploring these ideas.

Present Investigation

In summary, there were three main objectives of interest. First, temporal stability of motivational and contextual beliefs was investigated. Specific questions included (1) how stable each of these beliefs was, (2) whether self-referenced beliefs and context-related perceptions were associated with different degrees of stability, and (3) whether subject-specific perceptions and more general beliefs demonstrated different degrees of stability. Second, between-domain relations of motivational constructs were examined. When beliefs toward different subject areas were found to be closely intercorrelated, a notion of common underlying belief was tested by specifying a higher-order factor. Further, it was examined whether this empirical factor, formed on the basis of subject-specific beliefs, was distinct from motivational beliefs that were directly assessed in reference to school learning in general (see Yeung et al., 2000, for a similar strategy). Third, consistency of relations among motivational constructs was studied across (1) subject matter areas, (2) specific and general academic contexts, and (3) times of the school year.

Recently, Bong (2001a) reported an investigation on the between- and within-domain relations of academic motivation beliefs. The present study shares many of its strong points such as the inclusion of major motivational constructs (i.e., self-efficacy, task-value, and achievement goals) and multiple assessments of the constructs across different subject areas. One of the shortcomings of the previous Bong study was that concrete outcome variables such as task-choice or performance indexes were not included. Therefore, it was not possible in that study to determine the consistency of relations that extended to actual behaviors as well as potential impact of such outcomes on subsequent motivation. In the current study, motivational beliefs and perceptions were assessed (1) in reference to three specific subject areas, (2) in reference to the school learning in general, and (3) in the beginnings of the first and second semesters of the academic year. Scores on the first- and second-semester final exams in the three subjects were used as achievement indexes. Because the first-semester final exam took place between the first and second assessments of motivational constructs, effects of achievement outcomes on subsequent motivation could be examined. Also, the inclusion of contextual variables allowed examining the reciprocal role of perceived contexts on student motivation, affect, and achievement, which was not looked at in the previous study. Finally, in the present investigation, all the data were collected during the first year of high school. It was presumed that students' perceptions toward their school and classroom environment and, to a lesser extent perhaps, their beliefs toward different subject matter areas at the high-school level had not been firmly established yet. Change over time, if any, in these perceptions and beliefs was hence believed to manifest itself more easily during this period.

Method

Participants and Procedures

A total of 389 freshmen at a public female high school in Seoul, Korea, participated. A majority of students in this school come from middle or lower-middle income families. Korean secondary schools begin their academic year on the second day of March and finish their first semester in mid July. A second semester starts in mid August and continues through mid February. There are three breaks, a summer break between the two semesters, a winter break from mid December to mid January, and a spring break of about two weeks toward the end of February before the new school year starts. The motivation surveys were administered three times throughout the year. The first administration took place in mid April, about a month and a half into the academic year and a little less than half way through the first semester. Students were believed to have formed some impressions of their school and classroom environments by this time. The second administration was in mid October, again a little less than half way through the second semester. Students had received report cards on their first semester performance between the first and second surveys. The final survey was conducted in mid February near the end of the school year. At this time, only perceptions of contexts and self-efficacy were assessed. Students took their first- and second-semester final exams in mid July and early December, respectively.

Missing data ranged less than 5% of the responses for all but one variable, for which the missing rate was 5.7%. Missing values in each variable were replaced with its mean. Fourteen students were excluded from the sample because they missed one or more of either the motivational surveys or final examinations. The final sample thus consisted of 375 students. Students completed the motivation questionnaires during regular classroom hours. They were assured of confidentiality of their responses.

Measures

Items and scales used in the present study came from previous research. Wordings for the same variables were strictly parallel across different referent contexts (e.g., specific subjects or general school learning). Students expressed their agreement to each of the statements on a response scale ranging from 1 (not at all true/strongly disagree) to 5 (very true/strongly agree).

Motivational and affective variables. Eight variables belonged to this category. These were self-efficacy for self-regulated learning, academic self-efficacy, task-value, mastery goal, performance-approach goal, performance-avoidance goal, school affect, and feelings of school belonging. All eleven items of the self-efficacy for self-regulated learning scale used in Zimmerman, Bandura, and Martinez-Pons (1992) were adopted (e.g., "I'm confident that I can finish my homework on time," "I'm confident that I can study when there are other interesting things to do"). Five self-efficacy items were adopted from the Self-Efficacy subscale of the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich & De Groot, 1990, e.g., "I am sure that I can do an excellent job on the problems and tasks assigned for [subject] class") and Patterns of Adaptive Learning Survey (PALS; Roeser et al., 1996, e.g., "I'm certain I can master the skills taught in [subject] this year"). Task-value items consisted of three items, each referring to perceived importance, perceived usefulness, and interest in the subject.

As regards achievement goals, there were five mastery goal (e.g., "Understanding the work in [subject] is more important to me than the grade I get") and three performance-approach goal items (e.g., "I like to show my [subject] teacher that I'm smarter than the other students") adapted from PALS. Two items on the PALS that were originally classified as performance-approach goal items were used as indicators of performance-avoidance goal in this study. These were "I worry about whether my [subject] teacher thinks that I am as smart as the other students in my class" and "I worry about doing worse than the other students in [subject] class." At the second survey administration, the first item was reworded as "The reason why I study [subject] is so that the teacher doesn't think that I'm not as smart as the other students in my class." Also, one item was added to increase reliability of the scale (i.e., "One of the important goals for me in [subject] class is to avoid looking incompetent than the other students in my [subject] class").

Academic self-efficacy, task-value, and achievement goal orientation items were also rewritten so that they referred to school learning in general rather than specific subjects. Portions of items referring to the specific subjects were substituted with words such as "school" or "schoolwork" (e.g., "I am sure that I can do an excellent job on the problems and tasks assigned for schoolwork," "Understanding the work in school is more important to me than the grades I get"). As a result, these motivation variables were assessed in reference to three specific school subjects, which were Korean, English, and math, as well as school learning in general. Items on positive school affect (e.g., "I like being in school") were adopted from Wolters, Garcia, and Pintrich (1992, cited in Roeser et al., 1996). Three items were adopted from PALS for measuring feelings of school belonging (e.g., "I feel that I matter in this school").

Contextual variables. Items for measuring contextual perceptions were mostly adopted from PALS. Task- and ability-goal structures were assessed in reference to specific subject classes (i.e., Korean, English, and math), homeroom classes, and school in general. There were five items for each of the perceived school/classroom task-goal structure (e.g., "In this [school/subject class], understanding the work is more important than getting the right answers") and perceived school/classroom ability-goal structure (e.g., "In this [school/subject class], teachers only care about the smart students"). Perceived teacher-student relationship was assessed at the school level as well as in reference to homeroom classes (e.g., "In this [school/homeroom class], teachers and students really trust one another"). The perceived parental expectation scale consisted of three items adapted from Ethington (1991, e.g., "My parents want me to get a good grade in school").

Achievement variables. Final exam scores in Korean, English, and math for the first and second semesters comprised the achievement indexes.

Results

Descriptive Statistics

Table 1 reports the descriptive statistics of scales. Overall, average scores of the scales fell in the reasonable range with most scales also demonstrating acceptable degrees of internal consistency.

Exceptions were the performance-avoidance goal scales, whose alpha values ranged below .60 at Time 1. The small number of items (n = 2) is suspected to have contributed to the low reliability coefficients. When an extra item was added at Time 2, reliability of these scales improved noticeably. Across the three assessment points, students expressed stronger perceptions of academic self-efficacy for performing successfully in school or within the contexts of specific school subjects ($3.19 \leq M \leq 3.89$) than their self-efficacy for self-regulated learning ($2.82 \leq M \leq 2.99$). Other things that deserve attention include the slightly lower perceptions of classroom ability-goal structures within specific subject classes in comparison with the same perception formed in reference to their school in general. Students' mastery goal orientations in Korean were also somewhat lower than their mastery goal scores in other subject areas.

Stability Coefficients

Contextual perceptions. Confirmatory factor analysis (CFA) models were constructed with each of the four perception variables—perceived school/classroom task-goal structure, perceived school/classroom ability-goal structure, perceived teacher-student relationship, and perceived parental expectation. Perceptions regarding different contexts at the same assessment point (e.g., Time 1 perceived teacher-student relationship at the school-level and Time 1 perceived teacher-student relationship in a homeroom class) were hypothesized to correlate. Stability paths were specified between identical constructs at different measurement points such that perceptions previously assessed directly influenced the same perceptions assessed later. Uniquenesses were correlated between items that shared the same wording, which worked to prevent obtaining inflated estimates of stability. Table 2 reports the stability coefficients along with the goodness of fit indexes of these models.

Perceptions of school/classroom task-goal structures showed low to moderate degrees of stability, as did perceptions of school/classroom ability-goal structures. On average, perceptions of ability-goal structures were less stable (Time 1 average = .32) than perceptions of task-goal structures (Time 1 average = .46). As will be seen later, students' perceptions of an ability-goal structure appear more heavily affected by achievement outcomes than their task-goal structure perceptions. This seems partly responsible for the lower stability coefficients of perceived school/classroom ability-goal structures. It is also interesting to note that perceptions of goal structures in homeroom and specific subject classes were less stable than corresponding perceptions at the school level. Stability coefficients were particularly low with regard to English and math classes. Students were taught in different achievement groupings in these two subjects and their memberships could change from Time 1 to Time 2 depending on their first semester exam scores. The two upper tracks were taught by the same teacher throughout the year as were the two lower tracks. There were 22.4% and 9.3% of the students in English and math, respectively, whose track memberships changed between the upper and lower tracks. This undoubtedly played some role in lowering the stability of goal structure perceptions.

Perceived teacher-student relationships demonstrated moderate to high degrees of stability. Again, perceptions at the school-level emerged more stable than perceptions of the homeroom class. This trend was more noticeable between Time 1 and Time 2 than between Time 2 and Time 3. Students' perceptions of parental expectation demonstrated strong stability coefficients (.774 and .740). In fact, among all the constructs considered, this was one of the few constructs with stability coefficients greater than .70. In general, perceptions of contexts were more stable from Time 2 to Time 3 than from Time 1 to Time 2. However, perceived parental expectations showed strong and comparable stability coefficients during both periods.

Individual motivational beliefs. Students' motivational beliefs concerning their own beliefs and attitudes mostly displayed moderate degrees of stability with several exceptions. The affective reactions to schooling scale was associated with relatively stronger stability coefficients compared with other motivational beliefs, especially during the Time 2 and Time 3 period. Perceptions of self-efficacy for self-regulated learning also stayed highly stable from Time 1 all the way through Time 3. Stability coefficients of academic self-efficacy, task-value, and achievement goals ranged between .491 and .697. On average, performance-approach (Time 1 average = .542) and performance-avoidance goals (Time 1 average = .512) appeared less stable than perceived self-efficacy (Time 1 average = .615), task-value (Time 1 average = .602), or mastery goal orientations (Time 1 average = .600). Interestingly, students' task-value perceptions and mastery goal orientations were more stable in math (.697 and .677, respectively) than in other school subjects or general school learning (stability coefficients ranging from .546 to .608).

Whereas most constructs that were assessed at all three time points showed a gradual increase in stability from the first (Time 1 to Time 2) to second (Time 2 to Time 3) assessment interval, an opposite pattern was observed with academic self-efficacy perceptions in specific school subjects. Perceived self-efficacy in Korean, English, and math all became less stable during the second assessment period, which is roughly equivalent to the second semester in school. This was not the case, however, with self-efficacy perceptions at more general levels, such as self-efficacy for self-regulated learning and self-efficacy toward school learning in general. It is also noteworthy that individual motivational beliefs were generally more stable than contextual perceptions such as perceived school/classroom goal structures.

Analyses of Within-Construct Between-Domain Relations

First- and second-order CFA models were specified with respect to each motivational construct. The purposes of these models were to, first, examine the strengths of relationships among domain-specific beliefs and, second, test the comparability of the general motivation factor that was directly assessed with the school-level items to the empirically extracted second-order general factor. For each motivation variable, a first-order CFA model was estimated with Korean-, English-, and math-specific factors (e.g., performance-approach goals in Korean, English, and math). It was followed by a second-order CFA model, which contained both a higher-order factor formed on the basis of covariances among the three subject-specific first-order factors and an independently assessed general (i.e., school-level) factor.

Academic self-efficacy. First-order CFA models were separately fitted to the Time 1, Time 2, and Time 3 data. In all three CFA models (Models ASE-T1, ASE-T2, and ASE-T3), the subject-specific self-efficacy factors were clearly defined by their respective items as demonstrated by statistically significant and substantial factor loadings (Mdn = .777, .801, and .862 at Time 1, Time 2, and Time 3, respectively). All models also demonstrated good fit to the data. Table 3 reports the goodness-of-fit indexes of these models. Correlation coefficients among the first-order factors are reported in Table 4. The Korean, English, and math self-efficacy factors showed moderate correlations at Time 1, which became gradually stronger at later assessment points. Because the correlations among the subject-specific factors were sizeable particularly at Time 3, it was deemed reasonable to fit a second-order model to the observed data.

Fitting a higher-order model requires both good theoretical rationale and empirical justification that the first-order factors are sufficiently correlated to begin with. The main objective of fitting a second-order model in this study was to determine whether any motivation factor assessed at the school level with items referring to the school learning in general (e.g., general academic self-efficacy) was equivalent to the empirical second-order factor (e.g., higher-order self-efficacy factor). When appropriate, results could also be taken as evidence of how particular motivation constructs are internally structured. As regards empirical justification, the magnitude of first-order factor correlations were examined along with Chi-square difference tests as a way of ascertaining the criticality of first-order factor correlations in the model definition. More specifically, when the first-order factor model with three correlated factors (i.e., Korean, English, and math) demonstrated good fit, a corresponding nested model with three uncorrelated factors was constructed. If the uncorrelated factor structure brought about a significant decrement in model fit compared with the correlated factor structure as determined by the Chi-square difference test, it may be concluded that the correlation among the first-order factors are critical in the model definition.

With the academic self-efficacy data, removing the correlation paths among the first-order factors by fixing them to zero (Models ASE-T1a, ASE-T2a, and ASE-T3a) resulted in statistically significant decrement in fit (see Table 3). A second-order model (Model HASE) was thus fitted to the data. Figure 1 illustrates the model structure at the factor level. As can be seen, the model is composed of a higher-order self-efficacy factor formed on the basis of three subject-specific first-order factors (HASE), a general academic self-efficacy factor that was directly assessed by the school-level items (ASEG), and a self-efficacy for self-regulated learning factor (SRLSE). Discriminant validity of these three factors was examined by specifying correlation paths among them. The model demonstrated acceptable fit to the data (see Table 3). Table 4 shows that the loadings of the subject-specific first-order factors on the second-order factor were all statistically significant and substantial in magnitude. More interesting, the correlation coefficients between the higher-order and general academic self-efficacy factors were .977, .956, and .634 at Time 1, Time 2, and Time 3, respectively. Therefore, an empirically extracted second-order general self-efficacy factor and a school-level general academic self-efficacy factor were indistinguishable at 2 out of 3 assessment points. In contrast, the self-efficacy for self-regulated learning factor demonstrated clear distinctiveness from either the second-order self-efficacy or school-level academic self-efficacy factors. The highest correlation coefficient of the self-efficacy for self-regulated learning factor with the other two general academic self-efficacy factors was .782, considerably lower than unity.

Task-value. The same analytic procedures were followed with respect to task-value constructs. The first-order CFA models with Korean, English, and math task-value factors separately fitted to the Time 1 and Time 2 data (Models VAL-T1 and VAL-T2) showed satisfactory fit (see Table 3). Each of the subject-specific task-value factors was clearly defined by its respective items (Mdn = .729 and .785 at Time 1 and Time 2, respectively). The Chi-square difference tests between correlated and uncorrelated factor structures (Models VAL-T1a and VAL-T2a) also yielded statistically significant results, attesting to the superiority of the models that preserved the correlation paths among the factors. Although the first-order factor correlation proved essential in the model definition, the magnitude of these correlations was not large enough to justify extracting a second-order factor. As Table 5 reports, all correlation coefficients among the subject-specific task-value factors at both time points ranged below .398. The English and math task-value factors showed the lowest correlation across the two time points. Therefore, results from the second-order factor analysis should not be interpreted as a legitimate representation of how these task-value perceptions are organized. The sole purpose of the second-order factor analysis, in this case, was not to study the internal structure of the construct but to examine simply the equivalence of the higher-order general factor and the directly assessed general task-value factor. The basic structure of the second-order model (Model HVAL) is described in Figure 2. Correlation coefficients between the higher-order general task-value factor, which was based on the common variances among the subject-specific first-order task-value factors, and the general task-value factor, which was assessed with task-value items referring to the school learning in general, were .940 at Time 1 and .784 at

Time 2. These two factors thus appeared comparable at least with regard to the Time 1 data. As shown in the disturbance terms column of Table 4, anywhere between 51% and 86% of the variance in the subject-specific task-value factors remained unaccounted for by the second-order factor.

Achievement goals. Time 1 and Time 2 CFA models with subject-specific first-order factors demonstrated acceptable fit with the mastery (Models MAST-T1 and MAST-T2), performance-approach (Models PAPP-T1 and PAPP-T2), and performance-avoidance goal data (PAVD-T1 and PAVD-T2). The median factor loadings at Time 1 and Time 2 were .622 and .716 for the mastery, .696 and .687 for the performance-approach, and .626 and .830 for the performance-avoidance goal factors, respectively. Table 3 presents other goodness-of-fit indexes. When nested models (i.e., correlated vs. uncorrelated factor structures) were compared to check the necessity of first-order factor covariances, statistically significant results were obtained with regard to all three achievement goal constructs (see Table 3). Examination of correlation coefficients, however, suggests that the degree of association among the subject-specific factors differs across goals. Correlations among the mastery achievement goal factors in Korean, English, and math were low, especially at Time 1. Across Time 1 and Time 2, mastery goals in verbal subjects (i.e., English and Korean) displayed lower correlations with mastery goals in math, compared with their correlations with each other. As was the case with task-value, results from the higher-order CFA (Model HMAST) were interpreted solely in reference to the equivalence of two general factors. No attempt was made to conjecture about how mastery goal perceptions might be structured. Table 5 reports correlation coefficients between the school-level mastery goal factors (MASTG) and the higher-order mastery goal factors (HMAST). Again, similar to the results from the task-value analysis, mastery goals assessed at the school-level appeared equivalent to the empirically extracted second-order general factor at Time 1. The correlation dropped slightly at Time 2, though remaining substantial (.896).

Results from the performance-approach and performance-avoidance goal CFAs were very different from those from the mastery goal analyses. However, results were remarkably similar between the two performance goals. As Table 5 shows, the performance-approach and performance-avoidance goal factors in Korean, English, and math were highly correlated among themselves (ranging between .625 and .734 for performance-approach goals and between .708 and .874 for performance-avoidance goals). There was no indication that relationships between verbal and math factors were any weaker than those between verbal factors. Nested model comparisons produced statistically significant results as expected. When second-order CFA models were specified with performance-approach (Model HPAPP) and performance-avoidance goals (Model HPAVD), excellent fit to the data was observed (see Table 3). Further, loadings of the subject-specific first-order factors on the second-order general factors were substantial in magnitude ($Mdn = .824$ for performance-approach and .874 for performance-avoidance goals), indicating that these higher-order factors were well defined by the lower-order factors. Disturbance terms reported in Table 5 show that approximately 69% of the variance in subject-specific performance-approach goals and about 79% of the variance in subject-specific performance-avoidance goals was accounted for by their respective higher-order factors. Correlation coefficients between the school-level general factors and higher-order general factors were well above .90 with an exception of the performance-avoidance goal factors at Time 2.

Analyses of Within-Domain Between-Construct Relations

Figure 3 presents a conceptual model that links the Time 1 and Time 2 data. Within each of the two assessment intervals that roughly correspond to the first and second semesters, perceptions of contexts were presumed to shape individual motivational beliefs, which in turn affect achievement outcomes. Previously held beliefs and preceding achievement outcomes were hypothesized to influence later beliefs and achievement. Further, achievement outcomes from the previous term were presumed to take part in molding later beliefs.

CFAs. Table 6 reports correlation coefficients among variables within the contexts of specific school subjects, which were separately estimated for Time 1 and Time 2. Overall, relationships among variables were mostly consistent across subject areas and assessment points. Students' perceptions of classroom task-goal structure were negatively related to their perceptions of classroom ability-goal structure. Perceived academic self-efficacy demonstrated strong positive correlations with both mastery and performance-approach goals. Its relationships were much stronger with mastery goals (average r = .704 at Time 1 and .711 at Time 2) than with performance-approach goals (average r = .422 at Time 1 and .350 at Time 2). Self-efficacy and performance-avoidance goals did not correlate. Relationships of mastery achievement goals with performance-approach goals were positive and moderate in magnitude (average r = .413 at Time 1 and .353 at Time 2), whereas its relationships with performance-avoidance goals were mostly nonsignificant except in math at Time 1 (r = .122). Correlations between performance-approach and performance-avoidance goals were strong and positive across subjects and measurement periods (average r = .568 at Time 1 and .507 at Time 2). Task-value perceptions showed strong positive correlations with academic self-efficacy (average r = .742 at Time 1 and .739 at Time 2) and mastery goals (average r = .883 at Time 1 and .872 at Time 2). Although these results were not surprising, correlation coefficients between task-value and mastery goals in math were above .90 at both Time 1 and Time 2, casting some doubts on their discriminant validity. There were moderate positive relations between task-value and performance-approach goals (average r = .465 at Time 1 and .344 at Time 2). The small positive correlations between task-value and performance-avoidance orientations at Time 1 (average r = .175) disappeared at Time 2.

Patterns of correlations among the contextual, motivational, and achievement variables at the school level were mostly consistent with those observed in specific school subjects. Students' perceptions of school task-goal structure were negatively related to their perceptions of school ability-goal structure. Perceived school task- and ability-goal structures correlated positively with perceived homeroom-class task- and ability-goal structures, respectively. Perceptions of both school and homeroom-class task-goal structures showed strong positive correlations with perceived teacher-student relationships in school and homeroom classes. The opposite was true with perceived ability-goal structures. Perceived parental expectations were most highly correlated with students' performance-approach and performance-avoidance achievement goals at both Time 1 and Time 2.

Relationships between mastery and performance-approach goals were again positive but in substantially reduced magnitude (average r = .145) compared with those observed in specific school subjects. In contrast, correlations between performance-approach and performance-avoidance goals at the school-level (average r = .605) were stronger than those in specific subjects. Self-efficacy for self-regulated learning demonstrated positive correlations with perceived school and homeroom-class task-goal structures, perceived teacher-student relationships, perceived parental expectations, mastery and performance-approach goals, academic self-efficacy, task-value, feelings of school belonging, school affect, and achievement. Relationships of academic self-efficacy to the three achievement goal variables were similar to those witnessed in specific school subjects, except that its relations with mastery goals became somewhat smaller. Task-value perceptions demonstrated particularly strong correlations with perceived school task-goal structure, perceived teacher-student relationships in school, mastery achievement goal, academic self-efficacy, feelings of school belonging, and school affect. Among these, correlation coefficients between task-value and mastery goals were greater than .90 at both measurement points (.91 at Time 1 and .93 at Time 2). Item content analysis revealed that only one of the task-value items (i.e., intrinsic interest) might potentially overlap with one of the mastery goal items (i.e., "The main reason I do my work in school is because I like to learn"). Nonetheless, due to the extremely high correlation coefficients between the two variables at the school level as well as in specific school subjects, task-value construct was excluded from further analysis. Achievement scores correlated most strongly with academic self-efficacy at both Time 1 and Time 2, although these coefficients were somewhat smaller than expected.

Specific School Subject SEMs. Structural equation models were specified on the basis of the conceptual model presented in Figure 3 and CFA results. Before a full longitudinal model was fitted to the data, separate Time 1 and Time 2 models were tested. Table 8 presents results of these separate SEM analyses. All models demonstrated acceptable fit to the data. Yet, the large disturbance terms for the goal (ranging from .79 to .98) and achievement variables (ranging from .87 to .94) indicate the existence of some unmodeled sources of influence. Most of the results from the separate Time 1 and Time 2 analyses were replicated in the longitudinal model that combined the data from both assessment periods.

Figure 4 presents the a priori SEM model tested at the specific school subject level. Within both time periods, perceived classroom task- and ability-goal structures were presumed to affect individual students' achievement goal adoptions and feelings of academic self-efficacy directly. Effects of perceived classroom goal structures on self-efficacy were to be mediated, in part, by achievement goals. Academic achievement was assumed to be under the direct influence of academic self-efficacy and achievement goals. Self-efficacy was also hypothesized to mediate the effects of achievement goals on achievement outcomes. Stability paths were specified between Time 1 and Time 2 variables. Achievement outcomes at Time 1 were hypothesized to influence all subsequent perception, motivation, and achievement variables. Any significant path observed among variables at Time 2, therefore, indicates effects that are significant above and beyond the effects of the same Time 1 variable (i.e., stability) and Time 1 achievement.

SEM results in Korean, English, and math are illustrated in Figure 5. Initial SEM models, in which stability paths from Time 1 achievement to Time 2 achievement were incorporated, rendered most of the other paths leading to Time 2 achievement nonsignificant. This stability path was removed from the final estimation to more carefully study the relationships among variables at Time 2. A few idiosyncrasies notwithstanding, results on the whole were more consistent than inconsistent across subject areas and assessment points. Perceptions of classroom task-goal structures linked positively to student mastery goals in all three subjects at both time points. Perceived task-focused classroom goal structures also worked to increase student performance-approach goals in all subjects and assessment periods, except in math at Time 2. Relations of perceived classroom task-goal structures to student performance-avoidance goals were not uniform across domains. The links were positive in Korean and English but nonsignificant in math at both Time 1 and Time 2. Perceptions of ability-focused classroom goals led to performance-avoidance goals in Korean (.21) and math (.14) at Time 1 and in English at Time 2 (.23). Perceived classroom ability-goal structures in math demonstrated positive relationships to all student achievement goals at Time 1, all of which dropped to nonsignificance at Time 2. Effects of perceived classroom goal structures on academic self-efficacy appeared mostly mediated by student achievement goals, though there were few exceptions. Perceptions of task-focused classroom goal structures showed direct positive connections to students' perceptions of academic self-efficacy in Korean at both Time 1 (.29) and Time 2 (.19). Perceptions of ability-focused classroom goal structures, in contrast, worked to lower students' perceived self-efficacy in math at Time 1 (-.15).

Relationships among student goals, self-efficacy, and achievement were more diversified.

Mastery achievement goals in all three subjects at both measurement periods were positively related to academic self-efficacy. Performance-approach goals also showed positive links to self-efficacy perceptions in English at both Time 1 (.33) and Time 2 (.19) and in math at Time 2 (.13). Performance-avoidance goals related negatively to perceived self-efficacy only in English (-.23 at Time 1 and -.12 at Time 2). These three achievement goals also demonstrated direct effects on achievement. In Korean, student mastery goals negatively predicted achievement at Time 1 (-.24), whereas performance-approach goals positively predicted achievement at Time 2 (.26). Performance-avoidance goals in Korean showed negative impact on achievement at Time 2 (-.27). In math, mastery achievement goals demonstrated direct positive effects on achievement at both Time 1 (.30) and Time 2 (.31). Math performance-approach goals at Time 1 also linked positively to math achievement (.27). Academic self-efficacy, in turn, displayed direct positive influence on achievement in Korean and English at both assessment points. In math, however, the relationship was negative at Time 1 (-.21) and nonsignificant at Time 2. Higher achievement in the subject during the first semester worked to raise students' mastery goal orientations in English (.26) and math (.16). However, it also strengthened students' perceptions of their classroom goal structures as being ability-focused in these two subject classes (.23 in English and .29 in math). English achievement at Time 1 demonstrated a positive relationship to English self-efficacy perceptions at Time 2 (.14).

School-Level SEM. Separate SEM analyses with Time 1 and Time 2 data were performed prior to a longitudinal model. Within each time frame, contextual perceptions were hypothesized to affect student achievement goals, self-efficacy for self-regulated learning, and feelings of school belonging. These latter variables were presumed to mediate effects of contextual perceptions on academic self-efficacy and positive school affect, which were, in turn, hypothesized to influence academic achievement directly. Three variables were excluded from analysis to alleviate a computer resource problem caused by having too many observed variables in the model. Perceived homeroom-class task-goal structure, perceived homeroom-class ability-goal structure, and perceived teacher-student relationships in homeroom classes were not included in the final model because they did not add much information in the presence of school-level variables (i.e., perceived school task- and ability-goal structures and perceived teacher-student relationships in school). To further remedy the memory allocation problem, three composite measured variables were created for the self-efficacy for self-regulated learning construct by combining several responses to the original eleven items.

Table 9 presents results of the separate Time 1 and Time 2 analyses. Both models demonstrated reasonable fit to the data, although much of the variance in achievement outcomes remained unaccounted for (.94 at Time 1 and .92 at Time 2). Figure 6 presents the school-level SEM results that combined the Time 1 and Time 2 models. As was the case with specific school subjects, the stability path between Time 1 and Time 2 achievement was fixed to zero. All other stability paths were estimated. Achievement at Time 1 was presumed to affect all subsequent perception and motivation variables. The school-level SEM model used a total of 90 observed variables, which was within the acceptable range for EQS. Initial estimation of the a priori model indicated that it was a reasonable approximation of the data, χ^2 (3757, $\underline{N}$ = 375) = 6282.36 (NNFI = .824, CFI = .835, res. = .05), although the model fit became poorer compared with those from the separate Time 1 and Time 2 analyses (see Table 9). Three additional direct effects were incorporated on the basis of multivariate La Grange multiplier tests and theoretical consideration. These paths flowed from perceived school task-goal structures to school affect, from perceived school ability-goal structures to academic self-efficacy, and from mastery achievement goals to feelings of school belonging, all at Time 2. These modifications resulted in slight improvement in model fit, χ^2 (3754, $\underline{N}$ = 375) =

6237.56 (NNFI = .827, CFI = .838, res. = .05). The statistical significance and magnitude of the other paths in the model remained virtually the same.

Relationships among exogenous variables were equivalent to those reported in CFA and will not be reiterated (see Table 7). Perceptions of school task-goal structures at Time 1 positively related to student mastery goals (.35) and self-efficacy for self-regulated learning (.27). Perceptions of school ability-goal structures, on the other hand, demonstrated positive links to performance-approach (.16) and performance-avoidance goals (.37). Perceived parental expectations, too, related positively to performance-approach (.37) and performance-avoidance goals (.23) at Time 1. School ability-goal structures also linked positively to performance-avoidance goals at Time 2 (.21), as did perceived parental expectations to performance-approach (.37) and performance-avoidance goals (.20). Perceived teacher-student relationships showed positive connections to self-efficacy for self-regulated learning at Time 1 (.32) and feelings of school belonging at both Time 1 (.82) and Time 2 (.35). Effects of the contextual variables at Time 1 were fully mediated by the hypothesized intervening variables. Self-efficacy for self-regulated learning (.54 at Time 1 and .43 at Time 2) and feelings of school belonging (.21 at Time 1 and .16 at Time 2) demonstrated direct positive effects on academic self-efficacy, while mastery goals (.44 at time 1 and .29 at Time 2) and feelings of school belonging (.53 at time 1 and .36 at Time 2) displayed direct positive effects on school affect during both periods. Performance-approach goals at Time 1 also exhibited a positive link to school affect (.25). Academic self-efficacy predicted achievement at both Time 1 (.27) and Time 2 (.32).

Higher achievement outcomes at Time 1 subsequently led to stronger self-efficacy for self-regulated learning (.19) and feelings of school belonging (.11) at Time 2. Other relationships changed somewhat during the second period. Perceptions of school task-goal structures had a positive effect on school affect (.15). Perceived school ability-goal structures, in addition to maintaining a positive relationship with performance-avoidance goals (.21), linked significantly to academic self-efficacy (.12). Perceived parental expectations at Time 2 positively related to students' self-efficacy for self-regulated learning (.11) in addition to the two performance goals. Perceived teacher-student relationships showed a negative path to performance-avoidance goals (-.25). Whereas academic self-efficacy was affected by self-efficacy for self-regulated learning and feelings of school belonging as it was at Time 1, performance-approach (.25) and performance-avoidance goals (-.17) also significantly related to perceived self-efficacy at Time 2. Mastery achievement goals showed direct effect on positive school affect as well as indirect effect through its direct effect on feelings of school belonging (.16). Self-efficacy for self-regulated learning at Time 2 demonstrated an unexpected negative relationship with positive school affect (-.27). This path appeared to be an artifact of an estimation procedure, given the positive correlation between the two variables (see Table 7).

Discussion

Temporal Stability of Motivational Beliefs and Perceptions

The question of stability in motivational beliefs and perceptions is important for understanding how malleable or rigid each belief is over a period of time. In the present research, all constructs were assessed in the beginnings of the first and second semesters with a 6-month interval, while several of them were assessed once more toward the end of an academic year. Findings can thus indicate whether students face the second semester of schooling with similar beliefs and perceptions to those they expressed during the first semester. When combined with a natural course of intervening events that occur between assessments, stability (or its lack thereof) can attest to the potential impact those events have on students' belief systems. Achievement outcomes in the form of test scores and grades are easily the most significant events in students' academic life. The present research generated some evidence that certain motivational beliefs are more susceptible than others to such academic feedback.

Among the motivational and contextual variables included in the study, perceptions of classroom ability-goal structures were associated with the lowest stability coefficients. Students who participated in this research were grouped into different achievement tracks in English and math. The fact that memberships of some students switched between upper- and lower-track classes midyear partly explains the low stability. Structural equation modeling results in English and math also demonstrated that these perceptions were directly affected by exam results (see Figure 5). Nonetheless, perceptions toward Korean and homeroom classes, where students stayed with the same class and teachers for the whole year, were likewise associated with low temporal stability. It is also interesting to note that students reported slightly stronger perceptions of ability-goal structures during the second semester (see Table 1). On the basis of these findings, it seems logical to conclude that students tend to perceive greater emphasis on ability in their school environment after having been provided with performance feedback. Presumably, verbal comments and instructional practices of teachers in relation to students' performance levels contributed to strengthening students' perceptions of their classrooms as ability-oriented.

Overall, individual motivational beliefs (e.g., mastery goal) were more stable than contextual perceptions (e.g., perceived classroom task-goal structures). This is consistent with what Anderman and Midgley (1997) reported. They found that correlations between students' perceptions of task and performance goals in English and math classes were substantially lower than correlations between their personal achievement goals before and after their transition to middle schools. Together, it nicely attests to the validity of these perceptions as assessed in these studies. Students are sensitive to changes in their environment and their reporting of perceived environmental contingencies appeared to truthfully reflect these changes. As should be expected and adding further evidence of validity, students' perceptions of parental expectations remained stable during the same period. More important, these findings indicate that individual motivational beliefs may be more resistant to change than contextual perceptions. Personal motivation variables generally demonstrated moderate to high degrees of stability over the six-month period. Again, there was a major achievement outcome between assessments. The magnitude of stability coefficients of these motivational constructs thus imply that these beliefs may not change easily, although there is some evidence that they do get affected by the academic feedback.

For some of the contextual perception variables such as perceived school ability-goal structures and teacher-student relationships, general-level assessments yielded higher stability coefficients than assessments within more specific contexts. This pattern was not too evident with individual motivational constructs, even though more broad-level constructs such as affective reactions to schooling and self-efficacy for self-regulated learning demonstrated somewhat stronger stability. Results are therefore inconclusive regarding the difference in stability between measurement levels. Some other findings are worthy of note. Among the constructs that were assessed three times throughout the academic year, academic self-efficacy was the only one whose stability between the second and third waves decreased from that obtained between the first and second waves. Some of these stability coefficients fell to the level comparable to those of contextual variables. Because it was the only individual-level variable assessed during the third wave, it is difficult to conjecture the precise nature of difference between the contextual and individual constructs during these later waves. Self-efficacy theory states that prior mastery experience is the most powerful source of efficacy relevant information (Bandura, 1997). One thing that can be speculated, therefore, is that these perceptions were affected to a greater degree by the second achievement outcomes (e.g., second semester final scores) than they were by the first achievement outcomes.

Achievement goals were associated with stability coefficients that were lower than those reported in previous studies (Elliot & McGregor, 2001; Roedel et al., 1994). Those studies differ from the present research with respect to several design features such as considerably shorter time lapses between assessments (i.e., one and two months and two weeks, respectively) and use of college samples. At the same time, stability coefficients of achievement goals observed in the present study were lower than those reported by Anderman and Midgley (1997) with elementary school students. In that study, students had made transitions to middle schools by the second assessment period, which undoubtedly played a role in changing their motivation. Still, developmental differences in the stability of achievement goals are an interesting and very plausible possibility. The present study involved high school students, who are believed to have established relatively firmer beliefs regarding their academic capability and nature of school subjects. Future research should examine whether motivational beliefs of younger students are indeed more variable over time and hence more receptive to instructional efforts to enhance them.

Mastery achievement goals and task-value perceptions in math were more stable than the same perceptions in other subject matter areas. Task-value was operationalized in this study as a composite variable encompassing perceived importance, utility, and interest. Analyses rendered task-value and mastery orientations empirically indistinguishable. Elliot, Harackiewicz, and colleagues' research (e.g., Elliot & Church, 1997; Harackiewicz et al., 1997, 2000) repeatedly revealed the strong positive effects of mastery goals on intrinsic motivation. In this sense, it is not surprising that task-value and mastery goals correlated so highly. Nevertheless, a question still remains as to why these perceptions had to be more stable in math. Two hypotheses are offered. The first hypothesis is sample characteristics. Female students are known to exhibit lower task-value and mastery goal perceptions in math than male students (e.g., Bong, 2001a)[2]. High school female students who participated in this research might have developed concrete beliefs regarding their interest in math and why they study math, which might have been evidenced in the form of higher stability. The second hypothesis deals with domain characteristics of math. In general, studies conducted in math and (perhaps to a lesser degree) science tend to yield results that are more consistent with theoretical predictions. Compared with other subjects, math seems to be associated with more unambiguous demand characteristics, which may help students (males and females alike) form more consistent judgments.

Structure of Motivational Beliefs and Assessment of General Factors

Among the personal motivational variables examined in the present investigation, task-value perceptions and mastery achievement goals demonstrated the lowest between-domain correlations. Students expressed different beliefs regarding the perceived value of each academic domain. Their reports of studying a subject for the purposes of mastering the tasks and increasing their competence were similarly confined to a particular school subject and did not necessarily extend to other areas. These findings are consistent with both Bong's (2001a) previous observation and the current study's finding that these two constructs are highly correlated. They also serve as persuasive evidence that achievement goals, at least mastery goals, are not personality dispositions that manifest themselves across different contexts. In contrast, performance-approach and performance-avoidance goals exhibited remarkably strong relationships across domains. Correlation coefficients among subject-specific performance-approach orientations ranged between .625 to .734 and those among subject-specific performance-avoidance goals ranged between .708 and .874. Empirically extracted general factors explained, on average, 69% and 79% of the specific variances in performance-approach and avoidance goals, respectively. This raises a possibility that performance orientations may be more strongly influenced by personality variables (e.g., fear of rejection, evaluation concerns), whereas mastery orientations may be more heavily affected by task-relevant variables.

The strong resemblance in the between-domain associations of performance-approach and performance-avoidance goals has been reported before (Bong, 2001a). Although these two goals tend to show different relationships to cognitive, affective, and performance indicators, this finding nevertheless calls into question that these two performance goals are determined by different sets of antecedents (e.g., Elliot & McGregor, 2001). In the present investigation, both performance-approach and avoidance goals shared the same predictors such as perceived school/classroom ability-goal structures and perceived parental expectations. This finding runs counter to the different antecedents that Elliot and colleagues discovered with college populations (e.g., Church, Elliot, & Gable, 2001; Elliot & Church, 1997). However, it is easy to imagine children who are initially performance-approach oriented but gradually leaning toward performance-avoidance as they experience repeated failures in school. In the present study, students were less likely to endorse mastery goals and more likely to pursue performance-avoidance goals during the second semester as their first-semester achievement scores were lower. It is suspected that there may be a more substantial overlap in the antecedents of performance-approach and performance-avoidance goals than previously assumed, especially among younger population. This conjecture needs to be subjected to further empirical scrutiny by longitudinal studies that closely follow developmental changes in achievement goal adoptions.

Perceptions of academic self-efficacy were somewhat more strongly correlated across academic areas, a finding consistent with previous reports (Bong, 1997, 2001a). The degree of their association became stronger as the academic year progressed. Students' achievements in various school subjects tend to be highly correlated, which was certainly the case with the present sample. Students' first-semester midterm scores in the three school subjects correlated highly ($.525 \leq \underline{r} \leq .657$), as did their first- ($.525 \leq \underline{r} \leq .640$) and second-semester final scores ($.538 \leq \underline{r} \leq .617$). Therefore, it is not surprising to observe moderate correlations among efficacy beliefs, whose primary source of information is previous achievement history (Bandura, 1997). It is equally important not to be misled into believing that these moderate correlations among efficacy beliefs in different subject areas suggest that students face different academic subjects with equal certitude. Granted, many students have similar achievement history in major academic areas and, as a consequence, would feel similarly efficacious (or inefficacious) in these areas. Yet a general academic self-efficacy factor accounted for only about 50% of the specific self-efficacy variances on average, a finding that sharply contrasts with those from the performance goal orientations.

From the measurement perspective, it is encouraging to observe that the empirically extracted higher-order general factors appeared equivalent to motivation factors directly assessed at the general level—schooling and academic learning in general. This finding applies to all personal motivation constructs included in this study. With respect to academic self-efficacy, findings also demonstrated that self-efficacy for self-regulated learning and general academic self-efficacy perceptions are two separate factors. Similar results have been reported with a college sample (Bong, 2001b). Therefore, self-efficacy for self-regulated learning appears more than sums of specific academic self-efficacy beliefs. This interpretation is consistent with the view of self-efficacy researchers in the field. Zimmerman et al. (1992) demonstrated the utility of self-efficacy for self-regulated learning as an important mediator of previous achievement on academic self-efficacy beliefs, a finding that was replicated in the present study.

Two important limitations should be noted. In the present research, the strengths of between-domain relations and explanatory capability of higher-order constructs were taken as evidence of how motivational beliefs were organized internally. However, a more rigorous test of internal structure of these motivational constructs should involve examination of the separability of different construct dimensions. Self-efficacy is conceived of as a more or less unitary construct in terms of its construct composition (Bong and Clark, 1999), whose lucid conceptual and operational definitions may not require such endeavor. Perceived task-value, on the other hand, is conceived of as a more inherently complex construct with interest, importance, usefulness, and cost dimensions (Wigfield & Eccles, 1992). Among these dimensions, intrinsic interest and attainment-utility values seem viable candidates for separation (see, e.g., Bong, 2001b; Wigfield et al., 1997). Another limitation is the limited number of specific school subjects included in this study. Only three academic domains were tapped, which precluded the possibility of testing competing structures. For example, Bong (2001a) found that some of the constructs were better represented with two higher-order factors, verbal and quantitative. Although the current findings are generally consistent with previous reports, the picture on the within-construct relations is inevitably incomplete.

Consistency of Construct Relations Across Domains, Measurement Levels, and Time

The general pattern of relations among motivation and achievement variables that emerged from the present investigation are more or less consistent with previous reports. Relationships are also generally consistent across different subject areas, measurement levels, and times of the school year that these variables were assessed. Some of the findings were consistent in all contexts examined in this research. For example, perceptions of task- and ability-goal structures always correlated negatively. Academic self-efficacy positively correlated with task-value, mastery goals, and performance-approach goals. Its relationships with mastery goals were always stronger than those with performance-approach goals. Academic self-efficacy and performance-avoidance goals did not correlate significantly. Performance-approach goals demonstrated strong positive correlations with performance-avoidance goals. The links between performance-approach goals and mastery goals were also positive but always came next in magnitude to those between the two performance goals. The only exception to this trend was the nonsignificant correlation between mastery and performance-approach goals at the school level during the second semester. Mastery goals did not display significant relationships with performance-avoidance goals at all times. Task-value and mastery goals always correlated positively. In fact, their correlations were too strong that task-value was removed from further analysis. Academic self-efficacy consistently exhibited significant positive relationships with achievement scores.

The conceptual model that formed the basis of structural equation analysis in this study is similar to what other researchers proposed (Church et al., 1997; Roeser et al. 1996). That is, contextual perception variables were thought to influence personal motivation (e.g., adoption of particular achievement goals, feelings of self-efficacy, school-related affect), which in turn affects eventual achievement outcomes. Because relationships were examined in a longitudinal fashion, it was possible to detect significant relationships, if any, between variables assessed during the first semester and those assessed during the second semester. Instead of reiterating specific findings, the discussion focuses on some of the more interesting or unexpected ones. Results show that the effects of contextual perceptions were indeed mostly mediated by personal motivation variables. Although this is consistent with previous research, the exact nature of the relationships was not. For example, perceived classroom task-goal structures in specific school subjects positively influenced not only student mastery goals but also student performance-approach goals and, in some instances, performance-avoidance goals. This finding stands in contrast to Roeser et al.'s (1996) report that task-goal structures related only to student mastery goals. However, the school-level analysis yielded results that are in line with Roeser et al.'s report such that perceived task-goal structures related only to mastery goals, while perceived ability-goal structures did only to performance-approach and performance-avoidance goals.

Why perceptions of task goals in classroom led to the adoption of performance-avoidance goals is unclear. Similar findings have been reported in Bong (2001a) with Korean middle school students: Performance-avoidance goals showed positive relations with adaptive motivation constructs such as self-efficacy, task-value, and mastery achievement goals. She attributed those findings to middle school students' tendency to perceive greater importance in extrinsic pressure than their older counterparts (Mac Iver, Stipek, & Daniels, 1991). More specifically, students may be motivated to master academic tasks and achieve well but, at the same time, may also be motivated to conceal their incompetence from their teachers and peers. Given that both Bong's previous study and the current study involved Korean samples, this may indicate that variables such as need for approval may function differently among these Asian students. On the other hand, the fact that such relationships were observed only in specific classroom settings may indicate that as students build up closer relationships with their teachers, they are more strongly motivated not only to perform well but also to not perform poorly. This reasoning is consistent with the observation that perceived expectations of parents (i.e., another major source of extrinsic pressure) led them to adopt both performance-approach and performance-avoidance goals.

Findings also suggest that perceptions of academic self-efficacy mediate effects of achievement goals on academic performance, both within specific subject areas and general school learning. Academic self-efficacy positively influenced subsequent achievement in all areas considered, although its effects were not beyond those of previous achievements during the second semester. Students tended to express stronger self-efficacy perceptions for self-regulating their learning and performing successfully in specific school subjects as well as stronger feelings of belonging to their school, as their first-semester final scores were higher. Also interesting and as seen in the school-level analysis, school ability-focused goal structures related more strongly to performance-avoidance than performance-approach goals, whereas perceived parental expectations related more strongly to performance-approach than performance-avoidance goals. Perceived parental expectations also increased students' self-efficacy for self-regulated learning during the second semester, thus demonstrating both positive and negative effects on student motivation. Ablard and Parker (1997), after surveying parents of academically gifted children, reported that an overwhelming majority (69%) of Asian parents listed performance-oriented academic goals for their children, compared with only 25% of White parents who reported such goals. They also found that children of parents who listed performance-goals for their children were significantly more likely to display dysfunctional perfectionism. Making the distinction between perceived mastery and performance goals of parents in future studies will help clarify the nature of effects of parental expectations on student psychology.

The present research clearly demonstrated the effects of contextual perceptions on student motivation that is above and beyond the effects of previous perceptions and prior achievement. In the current analysis, identical variables were assessed twice during the academic year and the stability paths were incorporated between the previous and later variables. Effects of earlier perceptions as well as achievement on subsequent variables were thus partialed out. Consequently, magnitude (and hence statistical significance) of relationships among variables was reduced, sometimes substantially, during the second semester. Even so, contextual perception variables maintained significant paths on personal achievement goals, as did achievement goals on academic self-efficacy. In other words, changes in perceptions were able to predict further changes in student motivation. This, however, was not the case for academic achievement. None of the motivational variables was able to predict the second-semester achievement scores above and beyond what could be predicted from the first-semester achievement scores[3]. Motivational intervention efforts may bring greater benefit to younger students whose achievement levels are still more malleable.

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Table 1

Descriptive Statistics of Scales

	T1 (N = 379)			T2 (N = 380)			T3 (N = 382)		
Scale	M	SD	α	M	SD	α	M	SD	α
Perceived school/classroom task-goal structure									
School (STSK)	3.37	.63	.67	3.20	.65	.73	3.37	.60	.71
Homeroom class (TTSK)	3.37	.68	.79	3.28	.67	.80	3.33	.71	.85
Korean (TTSKK)	3.24	.65	.77	3.12	.68	.79	--	--	--
English (TTSKE)	3.52	.70	.80	3.34	.72	.81	--	--	--
Math (TTSKM)	3.44	.69	.80	3.33	.71	.81	--	--	--
Perceived school ability-goal structure									
School (SABL)	2.55	.75	.84	2.74	.66	.78	2.67	.65	.78
Homeroom class (TABL)	2.18	.70	.87	2.29	.68	.86	2.30	.69	.87
Korean (TABLK)	2.09	.62	.90	2.32	.72	.91	--	--	--
English (TABLE)	1.94	.67	.92	2.19	.79	.92	--	--	--
Math (TABLM)	1.96	.68	.92	2.19	.73	.90	--	--	--
School affect (SAFF)	2.97	.84	.83	2.95	.86	.83	3.09	.84	.85
Feelings of school belonging (SBEL)	2.97	.76	.75	3.03	.77	.81	3.04	.74	.77
Perceived teacher-student relationship									
General school (TSRELG)	3.17	.69	.83	3.09	.66	.82	3.27	.65	.84
Homeroom class (TSRELC)	3.32	.76	.88	3.16	.77	.88	3.35	.79	.90
Perceived parental expectation (PEXP)	3.91	.75	.79	3.86	.69	.75	3.89	.72	.80
Self-efficacy for self-regulated learning (SRLSE)	2.82	.51	.80	2.97	.52	.81	2.99	.54	.83
Academic self-efficacy									
General academic (ASEG)	3.39	.65	.81	3.56	.66	.84	3.64	.67	.88
Korean (ASEK)	3.19	.68	.86	3.26	.72	.88	3.61	.74	.91
English (ASEE)	3.35	.78	.89	3.54	.76	.90	3.89	.77	.94
Math (ASEM)	3.41	.78	.91	3.45	.80	.91	3.76	.80	.95
Task-value									
General academic (VALG)	2.94	.71	.68	2.79	.73	.75	--	--	--
Korean (VALK)	2.89	.78	.73	2.77	.83	.79	--	--	--
English (VALE)	3.61	.82	.77	3.70	.79	.71	--	--	--
Math (VALM)	3.07	.95	.78	2.89	.96	.82	--	--	--

Table 1 (*continued*)

Scale	T1 (N = 379)			T2 (N = 380)			T3 (N = 382)		
	M	SD	α	M	SD	α	M	SD	α
Mastery goal									
General academic (MASTG)	3.34	.61	.60	3.51	.64	.60	--	--	--
Korean (MASTK)	2.91	.71	.75	2.97	.79	.79	--	--	--
English (MASTE)	3.20	.75	.78	3.32	.79	.80	--	--	--
Math (MASTM)	3.30	.80	.80	3.38	.87	.82	--	--	--
Performance-approach goal									
General academic (PAPPG)	3.54	.83	.58	3.51	.86	.70	--	--	--
Korean (PAPPK)	3.20	.82	.61	3.20	.91	.76	--	--	--
English (PAPPE)	3.44	.87	.72	3.37	.95	.78	--	--	--
Math (PAPPM)	3.47	.89	.71	3.44	.98	.80	--	--	--
Performance-avoidance goal									
General academic (PAVDG)	3.20	.82	.44	2.66	.76	.65	--	--	--
Korean (PAVDK)	2.88	.83	.57	2.53	.78	.75	--	--	--
English (PAVDE)	3.08	.91	.58	2.73	.87	.78	--	--	--
Math (PAVDM)	3.12	.89	.53	2.75	.88	.78	--	--	--
Achievement									
Korean (ACHK)	64.39	10.84	--	65.97	11.53	--	--	--	--
English (ACHE)	70.25	17.95	--	60.34	23.83	--	--	--	--
Math (ACHM)	56.55	23.00	--	66.08	18.87	--	--	--	--

Table 2

Stability Coefficients of Latent Variables

Model	T1 to T2	T2 to T3
1. Perceived school/classroom task-goal structure		
School	.476	.589
Homeroom class	.568	.616
Korean	.516	--
English	.343	--
Math	.394	--
χ^2 (1532, N = 375) = 2765.10, NNFI = .85, CFI = .87, res. = .06		
2. Perceived school/classroom ability-goal structure		
School	.416	.490
Homeroom class	.357	.499
Korean	.295	--
English	.200	--
Math	.319	--
χ^2 (1532, N = 375) = 2763.77, NNFI = .91, CFI = .92, res. = .06		
3. Perceived teacher-student relationship		
School	.562	.677
Homeroom class	.482	.638
χ^2 (353, N = 375) = 679.43, NNFI = .94, CFI = .95, res. = .06		
4. Perceived Parental Expectation	.774	.740
χ^2 (16, N = 375) = 29.80, NNFI = .98, CFI = .99, res. = .06		
5. Affective reactions to schooling		
School affect	.625	.735
Feelings of school belonging	.682	.777
χ^2 (110, N = 375) = 199.91, NNFI = .97, CFI = .98, res. = .04		
6. Self-efficacy perceptions		
Self-efficacy for self-regulated learning	.713	.765
Academic self-efficacy		
General academic	.584	.571
Korean	.630	.528

Table 2 (*continued*)

Model	T1 to T2	T2 to T3
English	.630	.504
Math	.615	.491
χ^2 (3938, N = 375) = 6541.85, NNFI = .89, CFI = .90, res. = .08		
7. Task-value		
General academic	.587	--
Korean	.546	--
English	.579	--
Math	.697	--
χ^2 (188, N = 375) = 413.18, NNFI = .92, CFI = .95, res. = .05		
8. Mastery goal		
General academic	.604	--
Korean	.509	--
English	.608	--
Math	.677	--
χ^2 (504, N = 375) = 1173.97, NNFI = .85, CFI = .89, res. = .06		
9. Performance-approach goal		
General academic	.530	--
Korean	.560	--
English	.549	--
Math	.529	--
χ^2 (188, N = 375) = 516.59, NNFI = .92, CFI = .95, res. = .09		
10. Performance-avoidance goal		
General academic	.542	--
Korean	.520	--
English	.491	--
Math	.493	--
χ^2 (120, N = 375) = 209.59, NNFI = .96, CFI = .98, res. = .04		

Note. Correlated uniquenesses were specified between items that shared the same wording across subjects, measurement levels, and times. In Model 5, uniquenesses of the first and second self-efficacy items were also correlated. In Model 7, uniquenesses of the first and second mastery goal items at T1 were correlated. All stability coefficients are significant at $p < .05$. NNFI = Bentler-Bonnett nonnormed fit index; CFI = comparative fit index; res. = average absolute standardized residuals.

Table 3

Goodness-of-Fit Indexes of First- and Second-Order Confirmatory Factor Analysis Models With Each Motivation Variable

Model	Description	χ^2	df	χ^2: df	NNFI	CFI	res.	$\Delta\chi^2$	Δdf	sig.
ASE-T1	First-order CFA model with T1 academic self-efficacy	203.680	69	2.95	.950	.967	.04			
ASE-T1a	Model ASE-T1 with no factor correlation	346.160	72	4.81	.903	.933	.18	142.48	3	*
ASE-T2	First-order CFA model with T2 academic self-efficacy	197.182	69	2.86	.958	.973	.04			
ASE-T2a	Model ASE-T2 with no factor correlation	393.306	72	5.46	.900	.932	.21	172.63	3	*
ASE-T3	First-order CFA model with T3 academic self-efficacy	220.679	69	3.20	.961	.974	.03			
ASE-T3a	Model ASE-T3 with no factor correlation	568.313	72	7.89	.878	.916	.30	347.63	3	*
HASE	Higher-order CFA model with T1, T2, and T3 academic self-efficacy combined	6601.080	3948	1.67	.892	.900	.06			
VAL-T1	First-order CFA model with T1 task-value	62.298	15	4.15	.893	.955	.04			
VAL-T1a	Model VAL-T1 with no factor correlation	127.832	18	7.10	.793	.897	.10	65.53	3	*
VAL-T2	First-order CFA model with T2 task-value	26.260	15	1.75	.977	.990	.02			
VAL-T2a	Model VAL-T2 with no factor correlation	102.662	18	5.70	.855	.927	.12	76.40	3	*
HVAL	Higher-order CFA model with T1 and T2 task-value combined	429.184	191	2.25	.916	.942	.05			
MAST-T1	First-order CFA model with T1 mastery goal	256.150	69	3.71	.863	.910	.08			
MAST-T1a	Model MAST-T1 with no factor correlation	309.944	72	4.30	.833	.886	.13	53.79	3	*
MAST-T2	First-order CFA model with T2 mastery goal	110.823	39	2.84	.941	.965	.05			
MAST-T2a	Model MAST-T2 with no factor correlation	219.872	42	5.23	.864	.913	.17	109.05	3	*
HMAST	Higher-order CFA model with T1 and T2 mastery goal combined	1162.334	507	2.29	.869	.894	.06			

Table 3 (*continued*)

Model	Description	χ^2	df	χ^2: df	NNFI	CFI	res.	$\Delta\chi^2$	Δdf	sig.
PAPP-T1	First-order CFA model with T1 performance-approach goal	26.764	15	1.78	.984	.994	.03			
PAPP-T1a	Model PAPP-T1 with no factor correlation	225.630	18	12.54	.772	.886	.20	198.87	3	*
PAPP-T2	First-order CFA model with T2 performance-approach goal	53.133	15	3.54	.957	.984	.06			
PAPP-T2a	Model PAPP-T2 with no factor correlation	342.604	18	19.03	.694	.847	.29	289.47	3	*
HPAPP	Higher-order CFA model with T1 and T2 performance-approach goal combined	505.424	191	2.65	.924	.948	.06			
PAVD-T1	First-order CFA model with T1 performance-avoidance goal	7.663	3	2.55	.972	.994	.02			
PAVD-T1a	Model PAVD-T1 with no factor correlation	118.113	6	19.69	.659	.864	.15	110.45	3	*
PAVD-T2	First-order CFA model with T2 performance-avoidance goal	18.765	15	1.25	.995	.998	.02			
PAVD-T2a	Model PAVD-T2 with no factor correlation	440.926	18	24.50	.547	.773	.28	422.16	3	*
HPAVD	Higher-order CFA model with T1 and T2 performance-avoidance goal combined	209.925	126	1.67	.967	.978	.04			

Note. NNFI = Bentler-Bonnett nonnormed fit index; CFI = comparative fit index; res. = average absolute standardized residuals.
* $p < .05$.

Table 4

Correlation Coefficients and Standardized Path Coefficients From Higher-Order Analysis With Academic Self-Efficacy

	First-Order Analysis			Second-Order Analysis									
				T1			T2			T3			
Variable	ASEK	ASEE	ASEM	HASE	SRLSE	ASEG	HASE	SRLSE	ASEG	HASE	SRLSE	ASEG	D
Time 1													
HASE													
SRLSE				(.740)									
ASEG				(.977)	(.782)								
ASEK	1.000			.720									.48
ASEE	.485	1.000		.638									.59
ASEM	.411	.397	1.000	.632									.60
Time 2													
HASE				.750									.44
SRLSE					.738		(.583)						.46
ASEG						.658	(.956)	(.680)					.57
ASEK	1.000						.720						.47
ASEE	.476	1.000					.704						.50
ASEM	.481	.515	1.000				.710						.50
Time 3													
HASE							.706						.50
SRLSE								.789		(.382)			.38
ASEG									.660	(.634)	(.523)		.56
ASEK	1.000									.778			.39
ASEE	.609	1.000								.789			.38
ASEM	.548	.662	1.000							.760			.42

Note. Numbers in parentheses are correlation coefficients. Underlined numbers are stability coefficients. All coefficients are significant at $p < .05$. H- = higher-order factor; -G = general; -K = Korean; -E = English; -M = math; D = disturbance terms.

Table 5

Correlation Coefficients and Standardized Path Coefficients From Higher-Order Analysis With Task-Value and Achievement Goals

	First-Order Analysis			Second-Order Analysis				
				T1		T2		
Variable	Korean	English	Math	Higher-Order	General	Higher-Order	General	D
				Task-Value				
Time 1								
HVAL								
VALG				(.940)				
VALK	1.000			.609				.63
VALE	.365	1.000		.368				.86
VALM	.372	.264	1.000	.697				.51
Time 2								
HVAL				.700				.51
VALG					.607	(.784)		.63
VALK	1.000					.629		.60
VALE	.360	1.000				.453		.81
VALM	.398	.263	1.000			.666		.56
				Mastery Goal				
Time 1								
HMAST								
MASTG				(1.015)				
MASTK	1.000			.712				.49
MASTE	.424	1.000		.583				.66
MASTM	.295	.264	1.000	.548				.70
Time 2								
HMAST				.802				.36
MASTG					.704	(.896)		.50
MASTK	1.000					.702		.51
MASTE	.500	1.000				.684		.53
MASTM	.352	.444	1.000			.657		.56

Table 5 (*continued*)

	First-Order Analysis			Second-Order Analysis				
				T1		T2		
Variable	Korean	English	Math	Higher-Order	General	Higher-Order	General	D
				Performance-Approach Goal				
Time 1								
HPAPP								
PAPPG				(.926)				
PAPPK	1.000			.821				.33
PAPPE	.707	1.000		.821				.32
PAPPM	.625	.699	1.000	.825				.32
Time 2								
HPAPP				.726				.47
PAPPG					.656	(.956)		.57
PAPPK	1.000					.823		.32
PAPPE	.662	1.000				.828		.31
PAPPM	.715	.734	1.000			.858		.26
				Performance-avoidance Goal				
Time 1								
HPAVD								
PAVDG				(.977)				
PAVDK	1.000			.922				.15
PAVDE	.874	1.000		.960				.08
PAVDM	.763	.868	1.000	.869				.25
Time 2								
HPAVD				.594				.65
PAVDG					.562	(.806)		.78
PAVDK	1.000					.856		.27
PAVDE	.748	1.000				.878		.23
PAVDM	.708	.746	1.000			.844		.29

Note. Numbers in parentheses are correlation coefficients. Underlined numbers are stability coefficients. All coefficients are significant at $p < .05$. H = higher-order factor; -G = general; -K = Korean; -E = English; -M = math; D = disturbance terms.

Table 6

Correlation Coefficients Among Latent Variables From Confirmatory Factor Analysis in Specific School Subjects

Variable	TTSK	TABL	ASE	MAST	PAPP	PAVD	VAL	ACH
Korean								
TTSK	--	-.396*	.500*	.432*	.341*	.251*	.555*	.201*
TABL	-.446*	--	-.157*	-.218*	-.084	.083	-.273*	-.068
ASE	.471*	-.121*	--	.682*	.387*	.107	.708*	.120*
MAST	.381*	-.117*	.702*	--	.339*	.051	.884*	.008
PAPP	.329*	-.111	.279*	.249*	--	.650*	.439*	.037
PAVD	.212*	.007	.060	.020	.525*	--	.193*	-.005
VAL	.490*	-.189*	.719*	.870*	.302*	.047	--	.030
ACH	.124*	-.111*	.129*	.091	.110*	-.073	.196*	--
English								
TTSK	--	-.547*	.380*	.546*	.387*	.157*	.507*	-.071
TABL	-.499*	--	-.237*	-.282*	-.192*	-.005	-.234*	.050
ASE	.223*	.064	--	.737*	.460*	-.015	.780*	.263*
MAST	.396*	-.051	.690*	--	.449*	.097	.843*	.171*
PAPP	.286*	.009	.357*	.392*	--	.543*	.436*	.119*
PAVD	.139*	.079	-.040	-.007	.516*	--	.136	-.016
VAL	.318*	-.047	.717*	.839*	.350*	-.027	--	.173*
ACH	-.036	.124*	.292*	.279*	.123*	-.102	.302*	--
Math								
TTSK	--	-.356*	.431*	.452*	.296*	.004	.451*	.013
TABL	-.303*	--	-.155*	.008	.026	.124*	.041	.294*
ASE	.346*	-.003	--	.692*	.418*	.084	.739*	.116*
MAST	.448*	-.007	.741*	--	.451*	.122*	.923*	.238*
PAPP	.219*	.001	.413*	.419*	--	.511*	.519*	.228*
PAVD	.074	.090	.077	.023	.481*	--	.196*	.062
VAL	.331*	.010	.781*	.907*	.380*	.012	--	.256*
ACH	-.033	.291*	.204*	.260*	.174*	-.033	.290*	--

Note. T1 coefficients are above the diagonal; T2 coefficients are below the diagonal.
* $p < .05$.

Table 7

Correlation Coefficients Among Latent Variables From Confirmatory Factor Analysis of School-Level Data

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. STSK	--	.62*	-.33*	-.33*	.14*	.74*	.50*	.46*	.20*	-.01	.49*	.39*	.70*	.52*	.45*	.05
2. TTSK	.69*	--	-.38*	-.54*	.10	.66*	.82*	.41*	.18*	.10	.42*	.48*	.56*	.53*	.51*	.05
3. SABL	-.39*	-.39*	--	.69*	.09	-.43*	-.39*	-.08	.09	.32*	-.11	-.16*	-.23*	-.23*	-.21*	-.08
4. TABL	-.26*	-.50*	.60*	--	-.05	-.41*	-.51*	-.11	.04	.19*	-.13*	-.24*	-.30*	-.31*	-.28*	-.04
5. PEXP	.18*	.17*	-.05	-.05	--	.10	.09	.03	.39*	.31*	.15*	.15*	.16*	.18*	.11	-.04
6. TRELG	.75*	.64*	-.40*	-.24*	.14*	--	.63*	.37*	.17*	.10	.45*	.41*	.62*	.70*	.56*	.08
7. TRELC	.53*	.86*	-.38*	-.54*	.12	.65*	--	.33*	.14*	.09	.38*	.38*	.46*	.51*	.46*	.01
8. MAST	.41*	.37*	-.25*	-.04	.09	.42*	.34*	--	.10	.16	.55*	.56*	.91*	.54*	.57*	.07
9. PAPP	.09	.10	.06	.03	.53*	.09	.14*	.19*	--	.60*	.28*	.30*	.35*	.31*	.31*	.10
10. PAVD	.00	.01	.28*	.10	.31*	-.13	-.00	-.07	.61*	--	.00	.04	.12	.04	.18*	-.17*
11. SRLSE	.44*	.37*	-.21*	-.03	.26*	.41*	.31*	.67*	.21*	-.06	--	.78*	.70*	.64*	.49*	.28*
12. ASE	.37*	.27*	-.10	.02	.27*	.39*	.24*	.52*	.32*	-.04	.73*	--	.58*	.65*	.44*	.23*
13. VAL	.51*	.35*	-.23*	.01	.03	.48*	.32*	.93*	.13	-.09	.65*	.43*	--	.73*	.83*	.22*
14. SBEL	.52*	.42*	-.29*	-.12	.17*	.65*	.45*	.56*	.28*	-.03	.63*	.59*	.61*	--	.68*	.25*
15. SAFF	.48*	.43*	-.21*	-.13*	.13*	.50*	.38*	.53*	.24*	-.02	.35*	.34*	.67*	.66*	--	.08
16. ACH	.02	.10	-.13*	-.03	.08	.09	.00	.12	.19*	-.10	.36*	.26*	.18*	.25*	.10	--

Note. T1 coefficients are above the diagonal; T2 coefficients are below the diagonal. χ^2 (1751, N = 375) = 2743.14 (NNFI = .90, CFI = .91, res. = .04) for T1 and χ^2 (1752, N = 375) = 2905.99 (NNFI = .88, CFI = .90, res. = .04) for T2.

* $p < .05$.

Table 8

Standardized Path Coefficients From Separate Structural Equation Models With Time 1 and Time 2 Data in Specific School Subjects

	Latent Variables Hypothesized to Influence Latent Variables in Rows													
	T1: First Semester							T2: Second Semester						
Variable	TTSK	TABL	MAST	PAPP	PAVD	ASE	D	TTSK	TABL	MAST	PAPP	PAVD	ASE	D
Korean														
TABL	(-.40*)							(-.45*)						
MAST	.40*	-.05					.82	.39*	.07					.87
PAPP	.37*	.06	(.23*)				.88	.35*	.04	(.14*)				.89
PAVD	.34*	.22*	(-.07)	(.63*)			.90	.27*	.13	(-.08)	(.50*)			.94
ASE	.28*	.09	.52*	.21*	-.13		.45	.28*	.07	.60*	.08	-.04		.44
ACH			-.17	.01	-.02	.26*	.96			-.04	.20*	-.20*	.13	.94
English														
TABL	(-.55*)							(-.50*)						
MAST	.55*	.01					.71	.48*	.19*					.83
PAPP	.40*	.03	(.28*)				.85	.39*	.20*	(.29*)				.89
PAVD	.22*	.12	(-.02)	(.53*)			.96	.24*	.20*	(-.11)	(.49*)			.95
ASE	.35*	-.04	.66*	.32*	-.22*		.43	.34	.24	.61*	.19*	-.14*		.50
ACH			-.17	.01	-.01	.41*	.90			.10	.10	-.15	.22*	.87
Math														
TABL	(-.36*)							(-.30*)						
MAST	.52*	.21*					.77	.48*	.15*					.79
PAPP	.35*	.16*	(.34*)				.90	.24*	.08	(.37*)				.95
PAVD	.05	.14*	(.11)	(.51*)			.98	.11	.12*	(-.02)	(.47*)			.98
ASE	.43	-.01*	.62*	.16*	-.05		.43	.38	.11	.69*	.12	.00		.43
ACH			.33*	.23*	-.07	-.21*	.88			.22*	.14	-.11	.01	.90

Note. Numbers in parentheses are correlation coefficients. In Korean, χ^2 (279, N = 375) = 666.71 (NNFI = .89, CFI = .90, res. = .05) for T1 and χ^2 (280, N = 375) = 557.29 (NNFI = .93, CFI = .94, res. = .04) for T2; In English, χ^2 (279, N = 375) = 630.57 (NNFI = .92, CFI = .93, res. = .04) for T1 and χ^2 (280, N = 375) = 650.82 (NNFI = .92, CFI = .93, res. = .04) for T2; In math, χ^2 (279, N = 375) = 681.34 (NNFI = .91, CFI = .92, res. = .05) for T1 and χ^2 (280, N = 375) = 592.58 (NNFI = .93, CFI = .94, res. = .04) for T2. D = disturbance terms

* $p < .05$.

Table 9

Standardized Path Coefficients From Separate School-Level Structural Equation Models With Time 1 and Time 2 Data

	Latent Variables Hypothesized to Influence Latent Variables in Rows											
Variable	STSK	SABL	PEXP	TSREL	MAST	PAPP	PAVD	SRLSE	SBEL	ASE	SAFF	D
Time 1												
SABL	(-.33*)											
PEXP	(.14*)	(.09)										
TSREL	(.73*)	(-.43*)	(.00)									
MAST	.31*	.12	-.06	.25								.87
PAPP	.08	.14	.35*	.16*	(.00)							.81
PAVD	-.16	.42*	.26*	.37*	(.16)	(.55*)						.75
SRLSE	.24*	.12	.08	.36*	(.41*)	(.16*)	(-.14)					.71
SBEL	.01	.09	.10	.78*								.41
ASE					.19*	.17	-.13	.51*	.23*		(-.19)	.35
SAFF					.37*	.21*	-.07	-.05	.52*			.44
ACH										.26*	-.04	.94
Time 2												
SABL	(-.40*)											
PEXP	(.18*)	(-.05)										
TSREL	(.75*)	(-.40*)	(.14*)									
MAST	.23	-.04	-.04	.29*								.75
PAPP	-.02	.13*	.53*	.11	(.20*)							.70
PAVD	.23	.28*	.31*	-.23*	(-.04)	(.56*)						.80
SRLSE	.20	.19	.20*	.28*	(.59*)	(.09)	(-.12)					.73
SBEL	.07	.01	.11*	.63*								.50
ASE					-.02	.22*	-12	.59*	.23*		(-.09)	.42
SAFF					.43*	.11	-.05	.27*	.59*			.47
ACH										.28*	.01	.92

Note. Numbers in parentheses are correlation coefficients. χ^2 (898, N = 375) = 1587.79 (NNFI = .88, CFI = .89, res. = .05) for T1 and χ^2 (899, N = 375) = 1702.71 (NNFI = .87, CFI = .88, res. = .04) for T2. D = disturbance terms.
* $p < .05$.

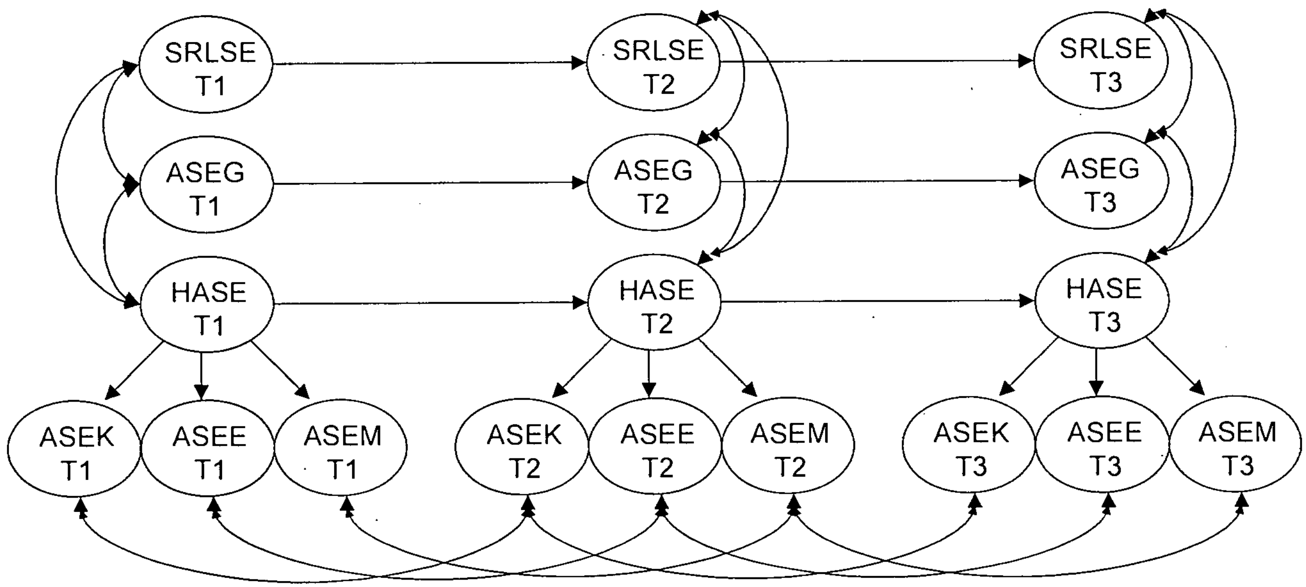

Figure 1. Higher-order model for academic self-efficacy (Model HASE).

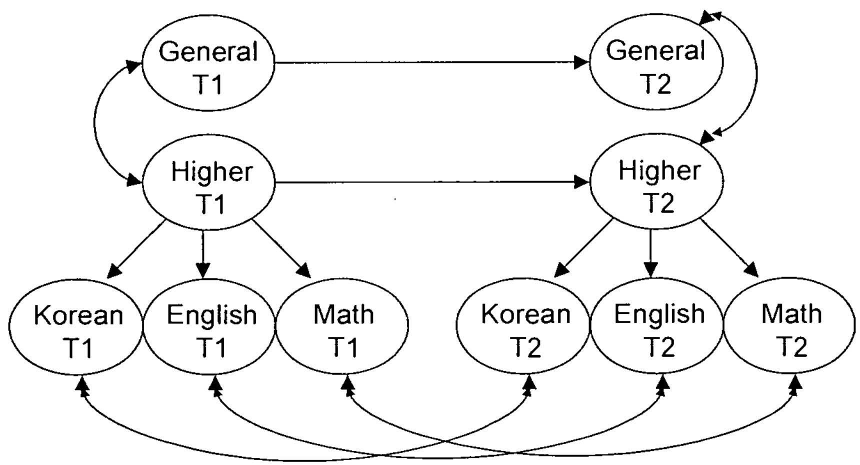

Figure 2. Higher-order model for task-value and achievement goals (Models HVAL, HMAST, HPAPP, and HPAVD).

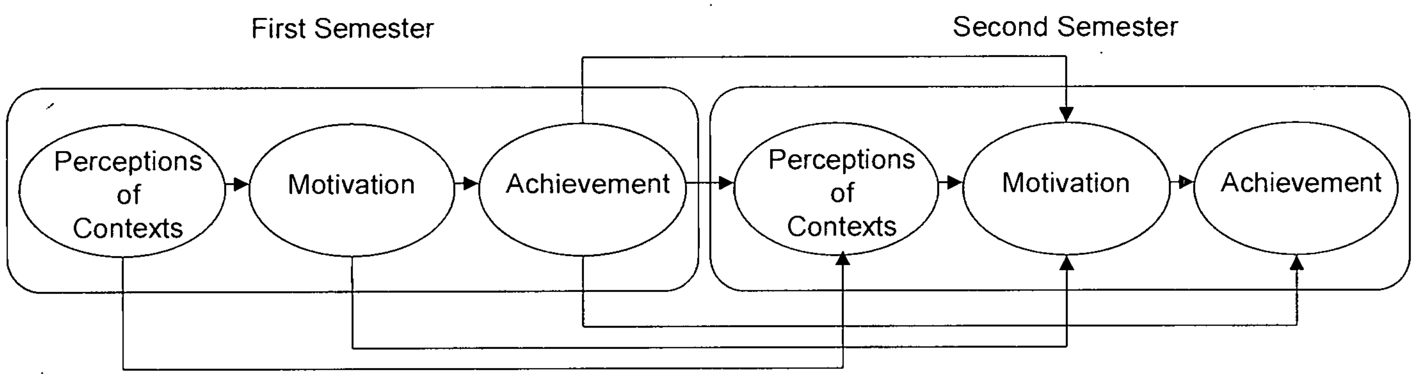

Figure 3. Conceptual model linking Time 1 and Time 2 data.

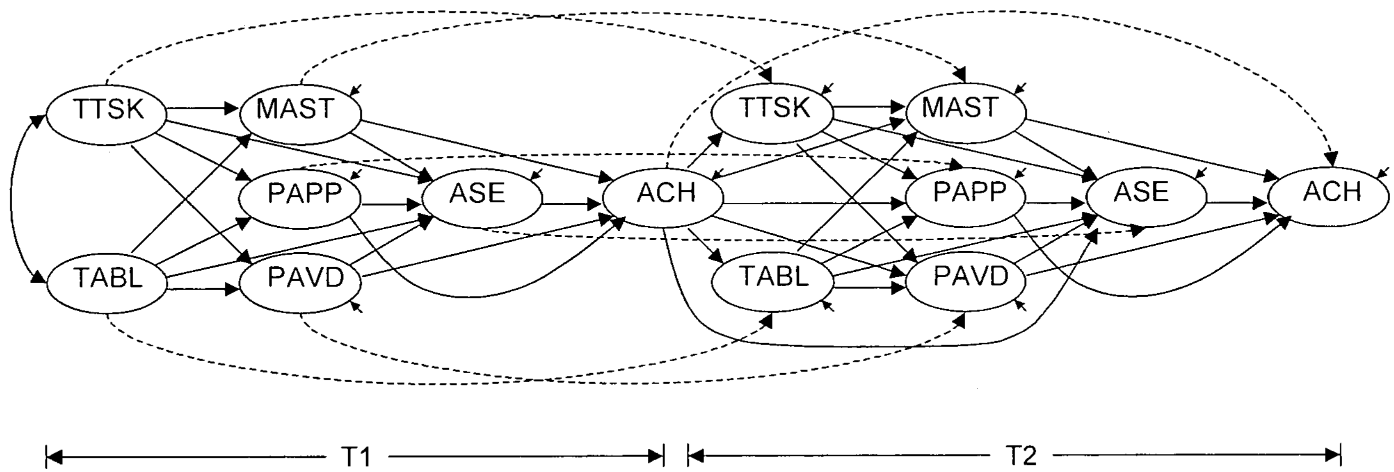

Figure 4. A priori model for subject-specific data. Dashed lines denote stability paths. Correlation among residual terms are not depicted for clarity.

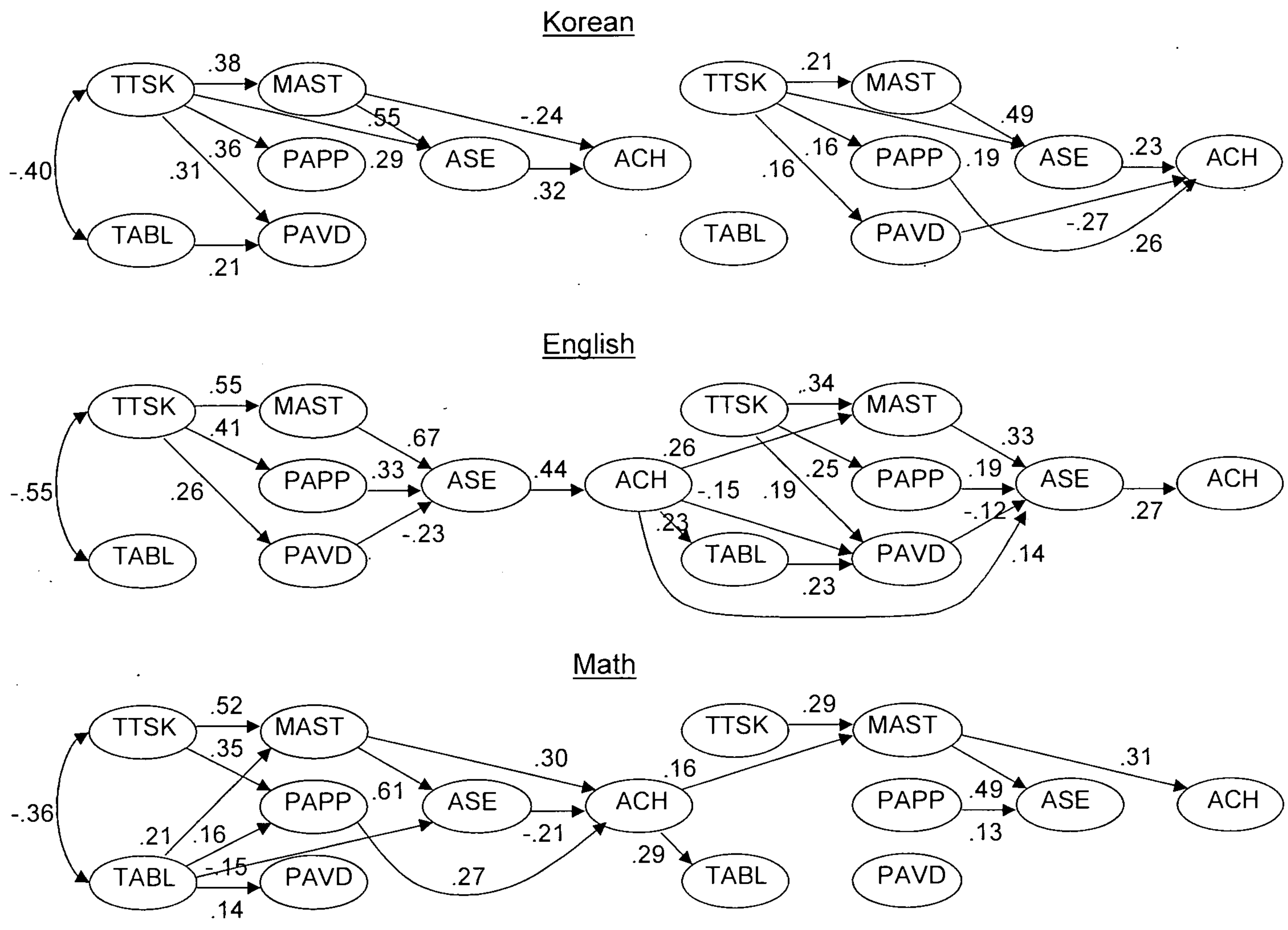

Figure 5. Standardized path coefficients from the final structural equation model with T1 and T2 data combined in specific school subjects. Only statistically significant paths are depicted. Stability paths, residual terms, and correlation among residual terms are not depicted for clarity. In Korean, χ^2 (1200, N = 375) = 2429.59 (NNFI = .87, CFI = .88, res. = .05); In English, χ^2 (1200, N = 375) = 2418.72 (NNFI = .88, CFI = .90, res. = .05); In math, χ^2 (1200, N = 375) = 2261.86 (NNFI = .90, CFI = .91, res. = .05).

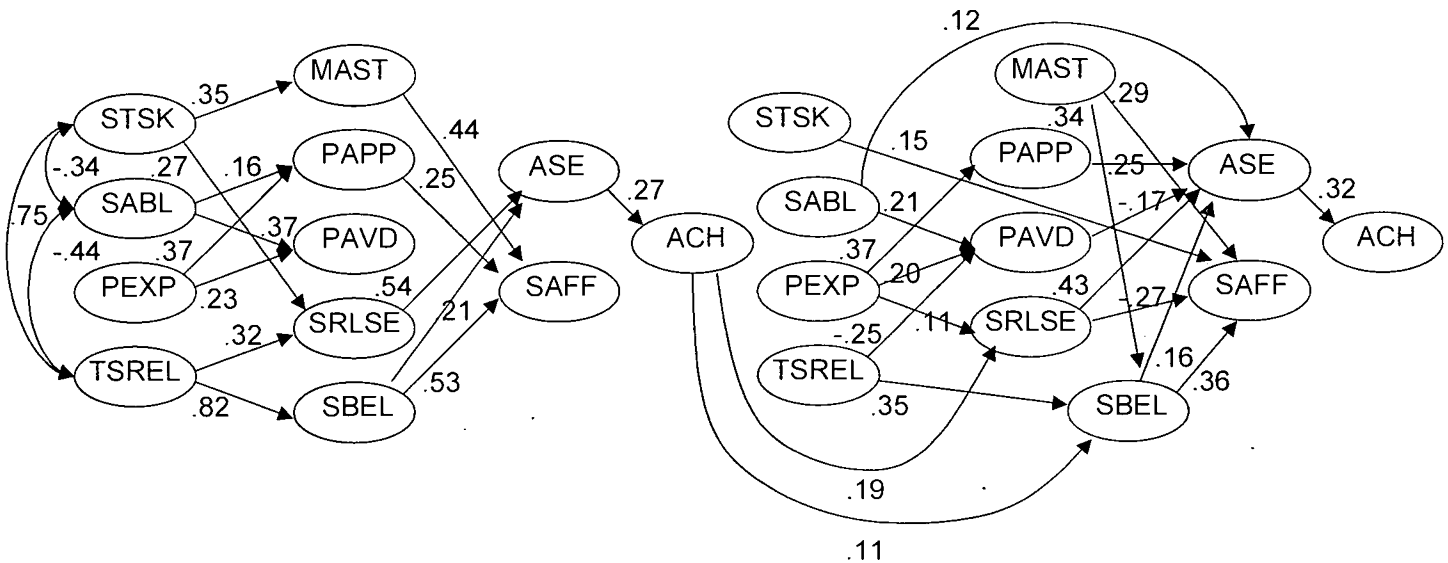

Figure 6. Standardized path coefficients from the final school-level structural equation model. Only statistically significant paths are depicted. Stability paths, residual terms, and correlation among residual terms are not depicted for clarity. χ^2 (3754, $\underline{N}$ = 375) = 6237.56 (NNFI = .83, CFI = .84, res. = .05).

Footnote

[1] Although several researchers have recently proposed yet another type of goal, a mastery-avoidance goal (e.g., Elliot & McGregor, 2001; Pintrich, 2000a, 2000b), no data on this fourth type of goal was collected during this investigation.

[2] It should be noted, however, that female students' task-value and mastery achievement goals in math were not always lower than their task-value and mastery achievement goals in other school subjects.

[3] In the initial a priori SEM model, both at the specific school subject and school levels, incorporating the stability paths between the first- and second-semester achievements made almost all paths leading from motivational variables to second-semester achievement scores nonsignificant. This does not mean that motivation variables no longer predicted achievement during the second semester. Quite the contrary, motivation variables significantly predicted the second-semester achievement scores when variances due to previous perceptions and achievements were not controlled for.

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