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Within-Grade Changes in Korean Girls' Motivation and Perceptions of the Learning Environment Across Domains and Achievement Levels

Mimi Bong
Ewha Womans University

This study tested whether students' motivation and perceptions of the learning environment changed significantly within the school year. Korean high school girls' ($N = 375$) perceptions of the performance goal structures in the environment increased significantly throughout the school year. The girls' personal achievement goals and task value demonstrated few significant within-grade changes, but their self-efficacy fluctuated significantly around examinations. Motivational beliefs were more stable than were perceptions of the environment. Nevertheless, the modified perceptions of the learning environment explained changes in motivation, justifying continued efforts to create a motivationally adaptive environment. Construct relations were consistent across different academic contexts. There was no evidence that low-achieving girls responded more negatively to the classroom performance goals than did their better-achieving peers.

Keywords: motivation, learning environment, achievement goals, self-efficacy

A wealth of evidence now exists regarding the importance of students' perceptions of their learning environment for their motivation and learning. In particular, many researchers have studied the effects of perceived classroom environments within an achievement goal orientation framework. *Achievement goal orientations* refer to the reasons and purposes for engaging in achievement-related behaviors in particular settings (Ames, 1992; Dweck & Leggett, 1988; Nicholls, 1984; Urdan & Maehr, 1995). When students pursue *mastery goals*, their primary purpose of engaging in academic activities is to develop their competencies. Mastery-oriented students welcome challenge and view occasional failures as a natural part of learning. In contrast, when students pursue performance goals, their main concern is how they are evaluated against their peers. Students with *performance-approach goals* strive to document their superior abilities, whereas those with *performance-avoid goals* seek to conceal their relative incompetence (Elliot & Harackiewicz, 1996; Middleton & Midgley, 1997; Skaalvik, 1997).

Students' decisions to pursue a particular achievement goal partly depend on the perceived goal structures of their learning environment (Church, Elliot, & Gable, 2001; Midgley, Anderman, & Hicks, 1995; Roeser, Midgley, & Urdan, 1996). Students perceive *mastery goal structures* in classrooms in which task mastery and effort investment are valued and understanding of the material is emphasized over test scores. Within such contexts, students more likely adopt mastery achievement goals for themselves. Perceptions of classroom mastery goal structures also increase students' self-efficacy, positive affect, and use of effective learning strategies (Ames & Archer, 1988; Midgley et al., 1995; Ryan & Patrick, 2001; Wolters, 2004). When teachers instead focus on evaluation, promote competition among students, and reward only the highest scorers, students perceive *performance goal structures* and tend to pursue performance-oriented achievement goals in those settings. Perceptions of classroom performance goal structures often encourage maladaptive motivational behaviors among students, such as avoidance of help seeking and use of self-handicapping strategies (Midgley & Urdan, 2001; Ryan, Gheen, & Midgley, 1998; Turner et al., 2002; Urdan, Midgley, & Anderman, 1998).

Investigators have demonstrated that students modify their views of the learning environment significantly across the school years. To date, significant changes in perceived learning environments and associated changes in personal motivation have been most clearly demonstrated in transition studies, in which students' perceptions of the environment were assessed before and after students' transition to middle school (e.g., Anderman & Midgley, 1997; Harter, Whitesell, & Kowalski, 1992; Urdan & Midgley, 2003). When transition is not involved, investigators typically assess students' impression of the environment once within each school year over several grade levels. As a result, it is unclear whether students' perceptions of the environment change to any appreciable degree within the same grade level. The question also remains as to whether the changes in students' perceptions of the environment between grade levels reflect primarily their reactions to classroom-specific episodes that took place within the school year or factors related to grade-level changes per se, such as more demanding curricula.

By assessing elementary school students' personal achievement goals more than once within each school year, Meece and Miller (2001) demonstrated that most of the changes in achievement goals occurred within the same grade level rather than between grade levels. Changes in students' personal achievement goals strongly imply analogous changes in their perceptions of the

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Correspondence concerning this article should be addressed to Mimi Bong, Department of Educational Technology, Ewha Womans University, 11-1 Daehyun-dong, Seodaemun-gu, Seoul 120-750, Korea. E-mail: mimibong@ewha.ac.kr

learning environment. That these changes occurred within the school year also increases the possibility that students adjust their perceptions and motivation largely as a result of regular classroom experiences. For example, major testing events are most likely to alter students' perceptions of their classroom environment, depending on how students are evaluated and test results communicated (Ames, 1992). If the emphasis is on individual progress and effort, it will augment students' perceptions of classroom mastery goal structures. In contrast, if teachers make social comparative aspects of the evaluation salient, students' perceptions of performance goal structures in the classroom will be strengthened.

Researchers acknowledge this possibility. Church et al. (2001) assessed students' perceptions of the classroom environments "one or two classes before the first exam to ensure that students had been given the opportunity to form an impression of the classroom environment, but had not been influenced by any performance feedback" (p. 45). Despite such recognition, the author was not aware of any study that has actually compared students' perceptions of their learning environment before and after major examinations within a single academic year. Also, the impact of the change, if any, in students' perceptions of the classroom goal structures within the school year on their motivation and performance has not been investigated. It is possible that students gradually grow numb to the presses they experience in their day-to-day schooling as they become more familiar with their classroom culture. Alternatively, the perceived environment could become increasingly more consequential as students come to realize more clearly what is expected of them. Students' reactions may also differ depending on their achievement level or the particular subject domain under consideration.

Changes in Students' Perceptions and Motivation Within the School Year

Meece and Miller (2001) recommended that changes in students' perceptions of the environment be assessed within the school year because they might be able to explain within-grade changes in students' personal motivation. The first objective of the present study was thus to examine whether significant changes occurred in students' perceptions of the goal structures in their learning environment and their personal motivation within the school year across major achievement testing. Temporal stability and directions of change were examined. The second objective was to test whether changes in students' perceptions of classroom goal structures were able to explain changes in students' personal motivation after accounting for their initial impression of the environment and personal motivation.

As mentioned earlier, researchers frequently assess students' perceptions of their classroom goal structures and their personal motivation concurrently and examine the predictive relations between the two. Several investigators demonstrated a long-term impact of the learning environment on student motivation by linking measures of the early environment to later motivation, while controlling for measures of prior motivation (e.g., Anderman et al., 2001; Ryan & Patrick, 2001). Although this provides a more conservative test of predictive relations, it still does not take into account the possibility that students' impression of the environment might have changed considerably over the course of the school year. By assessing both students' perceptions of the classroom goal structures and their personal motivation at multiple time points within the school year, it becomes possible to examine whether the changes in the perceived environment continue to exhibit significant relations with the changes in student motivation. It also enables researchers to explore how stable students' classroom perceptions are, whether certain perceptions change more dramatically than others, and whether the nature of relations between students' classroom perceptions and students' personal motivation remains consistent over time.

Temporal Stability

When assessed annually, students' perceptions of classroom goal structures demonstrate low to moderate stability coefficients across transition to middle school and beyond. These coefficients are generally lower than are those for personal achievement goals during the same period (Anderman & Midgley, 1997; Urdan & Midgley, 2003). Students' perceptions of classroom goal structures were presumed to change less within the same academic year than either across transition or between grade levels. Nevertheless, they were still hypothesized to be less stable than students' personal achievement goals during the school year for several reasons. First, personal achievement goal orientations in specific domains typically demonstrate strong to moderate stability coefficients over varying periods (Conroy, Elliot, & Hofer, 2003; Meece & Miller, 2001; Wolters, Yu, & Pintrich, 1996). Second, whereas stable individual difference variables such as achievement motivation (Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Harackiewicz, Barron, Tauer, & Elliot, 2002) and theories of intelligence (Dweck, 1989; Dweck & Leggett, 1988) are part of the known determinants of personal achievement goals, effects of these variables on students' perceptions of the environment are likely to be weaker. Third, evaluative feedback from the teachers would alter students' perceptions of the classroom goal structures more than it would students' personal achievement goal orientations.

Directions and Predictions of Change

Transition studies also showed that students tend to perceive an increased focus on performance goals and a decreased focus on mastery goals in their middle school environment (Anderman & Midgley, 1997; Urdan & Midgley, 2003). Negative changes in classroom perceptions often accompany significant drops in self-efficacy and personal mastery achievement goals. Researchers attribute these findings to the less personal and more controlling middle school culture characterized by a strong emphasis on grades, fewer student choices, and ubiquitous social comparison (Eccles et al., 1993; Roeser, Eccles, & Sameroff, 2000). Although direct evidence regarding the within-grade changes in students' classroom perceptions is lacking, Harter et al. (1992) reported that middle school students perceived a greater focus on external emphasis on academic performance and social comparison in their present learning environment compared with the previous year. Eighth graders demonstrated the largest increase in such perceptions.

Accordingly, it was hypothesized that high school students who participated in this research would perceive a growing emphasis on evaluation and social comparison and a diminishing emphasis on task mastery as the school year progressed. Corresponding increases in personal performance-approach goals and decreases in personal mastery goals, self-efficacy, and task value were pre-

dicted. On the basis of the assumption that changes in the perceived classroom goal structures reflect students' responses to major performance feedback and other classroom events, these altered perceptions of the environment were hypothesized to explain further changes in students' personal motivation beyond those predicted by prior motivation and achievement. Students' perceptions of the environment and their personal motivation were assessed before and after major achievement testing within the school year to examine these hypotheses.

Consistency of Motivational Relations

The third objective of the present study was to test consistency of the relations between students' perceptions of the learning environment, their personal motivation, and their performance across multiple domains and achievement levels.

Domain Differences

Students build different understandings of each subject matter area (Stodolski, Salk, & Glaessner, 1991). The ways students perceive and interpret classroom events also may differ across subject domains, as may their relations to other variables of interest. Compared with the number of investigations that addressed domain differences in the levels of motivation, relatively few studies have tested differences in the ways motivational constructs relate to one another. Researchers who did examine the cross-domain relations generally obtained similar associations among personal motivation variables such as achievement goal orientations, self-efficacy, and task value (Bong, 2001; Wolters et al., 1996; Wolters & Pintrich, 1998). Anderman and Midgley (1997) also reported parallel relations among motivational constructs across English and math, which included students' perceptions of the learning environment.

Nonetheless, several unique relations frequently emerge, even in studies otherwise reporting uniform results. Pajares, Britner, and Valiante (2000) documented that relations between students' motivation and performance were largely comparable across writing and science. Whereas performance-approach and performance-avoid goals were, respectively, a positive and a negative predictor of self-efficacy in writing, neither predicted self-efficacy in science. Bong (2001) observed that Korean students' performance-avoid goals displayed distinct relations with other motivational constructs in the domain of Korean compared with English, math, or science. There is also reason to suspect that the relations between students' perceptions of the environment and their motivation might fluctuate by the specificity of the context. Urdan and Midgley (2003) found that increased perceptions of the performance goal structures were associated with heightened personal performance goals at the general school level. However, a similar increase in the perceived performance goal structures in the math class did not produce an escalation in students' personal performance-approach or performance-avoid goals in math.

From a theoretical standpoint, evidence of the cross-domain generality of motivational relations should aid the development of comprehensive models of academic motivation that are not tied to any single domain (Bong, 1996). From a practical standpoint, the same evidence, or a lack thereof, should help determine the applicability of instructional implications derived from a particular subject area to other academic domains. To examine consistency of motivational relations across contexts, students' perceptions of the learning environment and their personal motivation were assessed in reference to general school learning as well as multiple subject domains in the present study. Fairly consistent relations were hypothesized across specific subject domains, whereas the relations were expected to differ somewhat at the general school level. On the basis of Urdan and Midgley's (2003) finding, relations between students' perceptions of the performance goal structures and students' personal performance-approach and performance-avoid goals were hypothesized to be stronger in the context of general school learning than within specific subject classes.

Gender and Achievement-Level Differences

Pomerantz, Altermatt, and Saxon (2002) reported that girls in Grades 4–6 were more prone to experience negative self-evaluation, anxiety, and depressive symptoms than were boys, despite their superior academic achievement. The researchers suspected that girls are more concerned about pleasing adults and view evaluative feedback as more diagnostic of their abilities compared with boys, which made them more vulnerable to internal distress. Their findings have direct implications for the present research, which considers the motivation of high school girls. If girls worry about disappointing their parents and teachers by performing poorly, and this apprehension functions as a source for increased motivation as Pomerantz et al. speculated, it is possible that the relationships between girls' perceptions of the environment and their motivation diverge from the conventional pattern. For example, perceived performance goal structures in the learning environment might enhance, rather than depress, girls' self-efficacy and mastery goal orientations.

Another potential moderator of the relationships between students' perceptions of the environment and their motivation is their achievement level. Researchers documented the maladaptive motivational responses of low-expectancy students to failure (Dweck & Leggett, 1988). Low-achieving girls, in particular, appear to suffer from negative ability attributions, higher internal distress, and performance deterioration upon failure than do high-achieving girls (Eccles [Parsons], Adler, & Meece, 1984; Pomerantz et al., 2002). Two hypotheses were generated on the basis of these findings. First, self-efficacy beliefs of low-achieving girls would likely be less stable compared with those of high-achieving girls. Second, low-achieving girls, compared with their higher achieving peers, would react more negatively to the perceived emphases on grades and social comparison in their learning environment. This latter hypothesis was only tentative because some argue that gifted, not low-achieving, girls tend to display motivational problems under highly competitive situations (Dai, 2002).

Academic Self-Efficacy as a Mediating Variable

Studies conducted within the achievement goal tradition commonly treat self-efficacy beliefs as an outcome of achievement goals (e.g., McGregor & Elliot, 2002; Middleton & Midgley, 1997; Pintrich, 2000; Roeser et al., 1996; Wolters et al., 1996). According to the goal theorists, achievement goals create a framework through which individuals interpret situations and process performance information (Duda & Nicholls, 1992; Dweck & Leggett, 1988). Identical success and failure experiences connote disparate ability implications for individuals with different achievement

goals and bring about unequal changes in their self-efficacy. However, it is equally viable that changes in achievement goals after evaluative feedback necessarily involve changes in self-efficacy beliefs. Only after students reach some conclusions regarding their competence at given tasks could they decide whether and how to approach or avoid them.

The achievement goal effects could also be moderated by subjective perceptions of ability. For instance, Elliott and Dweck (1988) found that performance-oriented children responded to failure in a highly maladaptive manner with deteriorated use of problem-solving strategies, negative affect, and attributions to uncontrollable causes when their self-efficacy was low. When their self-efficacy was high, performance-oriented children's behaviors were similar to those of learning goal-oriented children. In addition, conceptualizing self-efficacy primarily as an outcome variable is not entirely consistent with the key tenet of the self-efficacy theory, which claims that self-efficacy is a predictive construct of individuals' upcoming motivation, affect, and behavior (Bandura, 1977, 1997). Although not a major focus of the present study, it was of interest to explore whether students' self-efficacy mediated the relationship between their performance and their achievement goals or vice versa. No specific hypothesis was generated.

Method

Participants and Procedures

Participants were 389 freshmore (equivalent to U. S. Grade 10) girls at a public girls high school in Seoul, South Korea. The normal age range for an entering Korean high school freshmore class is from 16 years to 16 years and 11 months. Students in this school were primarily middle or lower-middle class. Because the participants were high school students, they were assumed to be conscious of both the broader school culture and the goals emphasized in each specific subject class. Also, changes in students' perceptions of the environment were expected to emerge more clearly in this group, whose perceptions were potentially more malleable than were those of senior students.

Korean secondary schools begin their academic year on the 2nd day of March and finish their first semester near the end of July. The first motivation survey was administered during regular classroom hours in mid-April (Time 1 [T1]), the 7th week after the school year had started and 2 weeks before the first midterm examinations. By this time, participants were presumed to have accumulated enough experience to form an impression of the goal structures in each learning context. Students took their first-semester final exams in early July, scores on which composed the T1 achievement indexes. Students reported their postexam self-efficacy 2 weeks later (Time 2 [T2]), which composed the T2 self-efficacy. Self-efficacy was assessed both before and after the exams so as not to miss any potential impact of the enactive mastery experiences on this highly context-specific construct (Bandura, 1977, 1997). The same procedures were repeated during the second semester, with the motivation survey in mid-October (Time 3 [T3]), followed by the second-semester final exams in December and the postexam self-efficacy survey in February (Time 4 [T4]). Therefore, students' perceptions of their learning environment and their personal motivation (except for their performance-avoid goals; see below) were assessed at least twice within the school year across major examinations. The T3 data were used in another study (Bong, 2004a), but the analyses do not overlap with those in the present study.

In this school, students were divided into four between-classrooms ability tracks in English and math. Students took placement tests before they officially entered the school, which formed the basis for the ability grouping in the first semester. Students' first-semester final exam scores determined their ability-track membership in the second semester. One teacher taught the two upper-track classes and another taught the two lower-track classes in each subject.

Measures

Items were adopted from previous research. All surveys were administered in Korean. The personal achievement goal orientations, academic self-efficacy, and task value items were translated by the author and have been used successfully with different groups of Korean middle and high school students (Bong, 2001). To further ensure proper translation, an additional coder independently translated all items into Korean. A third coder then checked the equivalence of the two translations. Of the 31 pairs of translated items, one pair was judged to convey slightly different meaning. Two of the three coders agreed that the translation included in the survey more accurately represented the original item. A fourth coder was tapped, who concurred with this decision. Item wording was parallel across different referent contexts (i.e., multiple subject domains and general school learning). A response scale ranging from 1 (*not true at all*) to 5 (*very true*) was used throughout the survey.

Perceptions of classroom goal structures. Students reported their perceptions of the classroom mastery and performance goal structures in three specific subject classes (i.e., Korean, English, and math) as well as in their school in general. Korean as a first language, English as a second language, and mathematics were chosen as specific subject domains because they represent the three most critical core subjects in the Korean secondary curriculum. There were five items each for assessing classroom mastery goal structure (e.g., "In this [school/subject class], teachers think how much you learn is more important than test scores or grades") and classroom performance goal structure (e.g., "In this [school/subject class], teachers only care about the smart students"). Items were adopted from Roeser et al. (1996).

Personal achievement goal orientations. There were five mastery goal orientation items (e.g., "The main reason why I do my work in [school/subject class] is because I like to learn") and five performance goal orientation items (e.g., "I would feel successful if I did better than most of the other students in my [school/subject class]") at T1, adopted from Roeser et al. (1996). Because Item 4, "I worry about whether my teachers think I am as smart as other kids in my (school/subject class)," and Item 5, "I worry about doing worse than other students in my (school/subject class)," of the performance goal orientation scale appeared similar in content to the current conceptualization of performance-avoid goal orientations, exploratory factor analyses with principal axis factoring were performed.

A single-factor solution explained 26.69%–35.80% of the scale variance, with Item 5 demonstrating the lowest loading in all contexts but Korean. A two-factor solution explained, on average, an additional 15.60% of the variance in Korean, English, and general school. However, the solution required up to 57 iterations and failed to converge in math. Therefore, Items 4 and 5 were removed, and the remaining three items formed the performance-approach goal orientation scale at T1. At T3, the following three performance-avoid goal orientation items from Middleton and Midgley (1997) and Roeser et al. (1996) were added: "The reason why I do my (school/subject class) work is so my teacher doesn't think I know less than others," "One of my main goals is to avoid looking like I'm stupid or I do worse than others in my (school/subject class)," and "I worry about doing worse than other students in my (school/subject class)."

Beliefs of academic self-efficacy and task value. Academic self-efficacy items were adapted from the Self-Efficacy subscale of the Motivated Strategies for Learning Questionnaire (e.g., "I am sure that I can do an excellent job on the problems and tasks assigned for [schoolwork/subject class]"; Pintrich & De Groot, 1990) and the Patterns of Adaptive Learning Scales (e.g., "I'm certain I can master the skills taught in [school/subject] this year"; Midgley et al., 2000). Task value was assessed

with three items, each referring to the perceived importance, perceived usefulness, and interest in the subject matter or schoolwork in general.

Achievement indexes. Students' scores on the semester final exams in Korean, English, and math composed the achievement indexes.

Overview of Data Analysis Strategies

To examine mean-level changes in students' perceptions of the environment and their personal motivation, I conducted a repeated measures multivariate analysis of variance (MANOVA) for each of the six constructs with time (i.e., T1 vs. T2 vs. T3 vs. T4 for self-efficacy and T1 vs. T3 for all other variables) and domain (i.e., general school, Korean, English, and math) as within-subject factors. Significant differences by time were followed by a repeated measures analysis of variance (ANOVA) within each domain. Up to 24 such tests could be conducted (i.e., 6 Constructs $\times$ 4 Domains). In the case of academic self-efficacy, significant differences by time were further analyzed with 12 paired-samples t tests (i.e., 4 Domains $\times$ 3 Paired Comparisons: T1 vs. T2, T2 vs. T3, and T3 vs. T4). Because a total of 42 tests could be performed, a comparisonwise alpha level of .001 (i.e., .05/42) was adopted to maintain the experimentwise $\alpha_E < .05$ (Hinkle, Wiersma, & Jurs, 1988; Stevens, 1992). Ability-track differences in the mean-level changes were not tested because many students belonged to different tracks across school subjects, semesters, or both.

I then specified confirmatory factor analysis (CFA) models within each domain to check the basic measurement properties of the constructs, followed by structural equation models (SEMs) to test their predictive relations. All CFAs and SEMs were conducted with EQS for Windows 6.1 (Bentler, 2005). To compare relative stability of the constructs over time, I specified an SEM model with only the T1 and T3 variables with equality constraints on all stability paths. The La Grange multiplier tests were consulted to see if any of the stability paths was statistically different from the others. To test consistency of the construct relations across domains, an identical SEM model was replicated in all specific and general learning contexts. Goodness-of-fit indexes were examined to determine whether it successfully reproduced the observed data pattern in each domain. For testing whether changes in students' perceptions of the environment after performance feedback explained further changes in their personal motivation, the variance attributable to construct stability, prior achievement, and postexam self-efficacy was partialed out from the second-semester variables in this model. Finally, multi-group SEMs between the upper and lower ability-track classes in English and math were used to test achievement-level differences in construct relations in these two subject areas.

Results

Missing data ranged less than 5.7% of the responses for all variables, which were replaced with mean scores to retain as many cases as possible. Fourteen students were excluded because they missed one or more of either the motivation surveys or final examinations, reducing the final sample size to $N = 375$. Table 1 reports reliability and descriptive statistics of the scales.

Mean-Level Changes

Perceptions of the environment. A repeated measures MANOVA on students' perceptions of the school/classroom mastery goal structures demonstrated that there was a significant overall difference by time, $F(1, 374) = 30.71$, $p < .001$, $\eta^2 = .08$, and domain, $F(3, 372) = 19.41$, $p < .001$, $\eta^2 = .14$. The Time $\times$ Domain interaction was not significant ($F < 1$), indicating that the direction of change was consistent across domains. Repeated measures ANOVAs showed that the perceived mastery goal structures decreased significantly from T1 to T3 in general school, $F(1, 374) = 22.33$, $p < .001$, $\eta^2 = .06$, and English, $F(1, 374) = 16.80$, $p < .001$, $\eta^2 = .04$. Students perceived a decreased emphasis on task mastery during the second semester as compared with the first semester in these two domains. The decrease was not significant in Korean or math. The hypothesis that students' perceptions of the mastery goal structures would become weaker after major achievement testing thus received only partial support.

A repeated measures MANOVA on students' perceptions of the school/classroom performance goal structures also revealed a significant overall difference by time, $F(1, 374) = 67.26$, $p < .001$, $\eta^2 = .15$, and domain, $F(3, 372) = 104.50$, $p < .001$, $\eta^2 = .46$, but the Time $\times$ Domain interaction was not significant ($F < 1$). Repeated measures ANOVAs showed that the perceived performance goal structures increased significantly from T1 to T3 in general school, $F(1, 374) = 22.44$, $p < .001$, $\eta^2 = .06$; Korean, $F(1, 374) = 32.33$, $p < .001$, $\eta^2 = .08$; English, $F(1, 374) = 27.66$, $p < .001$, $\eta^2 = .07$; and math, $F(1, 374) = 28.75$, $p < .001$, $\eta^2 = .07$. Students perceived a stronger focus on grades and relative ability during the second semester in all learning contexts. The hypothesis that students' perceptions of the performance goal structures would become stronger after major examinations was supported. It should be noted that the effect sizes were relatively small (η^2s $\leq .08$), even when the time-related changes proved significant.

Personal motivation. A repeated measures MANOVA on students' personal mastery goals revealed a significant difference by time, $F(1, 374) = 16.42$, $p < .001$, $\eta^2 = .04$, and domain, $F(3, 372) = 114.28$, $p < .001$, $\eta^2 = .48$. The Time $\times$ Domain interaction was not significant. Repeated measures ANOVAs demonstrated that students' mastery goals increased significantly from the first to the second semester only in the context of general school learning, $F(1, 374) = 23.87$, $p < .001$, $\eta^2 = .06$. The change was not significant in any of the specific subject domains. A repeated measures MANOVA on students' personal performance-approach goals indicated a significant difference by domain, $F(3, 372) = 52.45$, $p < .001$, $\eta^2 = .30$. The difference by time or Time $\times$ Domain interaction was not significant (Fs < 1). Performance-avoid goal orientations were not included in these analyses because they were assessed only at T3.

Task value was associated with a significant difference by domain, $F(3, 372) = 163.45$, $p < .001$, $\eta^2 = .57$, as determined by the repeated measures MANOVA. The difference by time failed to reach statistical significance ($p = .001$), yet the Time $\times$ Domain interaction was significant, $F(3, 372) = 9.47$, $p < .001$, $\eta^2 = .07$. Although students' task value scores during the second semester were lower compared with the task value scores assessed during the first semester in general school learning, Korean, and math, they were higher in English during the second semester.

A repeated measures MANOVA on students' self-efficacy beliefs yielded a significant overall difference by time, $F(3, 372) = 126.72$, $p < .001$, $\eta^2 = .51$, and domain, $F(3, 372) = 40.50$, $p < .001$, $\eta^2 = .25$, as well as significant Time $\times$ Domain interaction, $F(9, 366) = 10.58$, $p < .001$, $\eta^2 = .21$. Repeated measures ANOVAs within each domain proved significant in general school learning, $F(3, 372) = 92.68$, $p < .001$, $\eta^2 = .43$; Korean, $F(3, 372) = 58.70$, $p < .001$, $\eta^2 = .32$; English, $F(3, 372) = 101.55$,

Table 1
Descriptive Statistics of Scales

Scale	T1: Start of first semester (T2: After first-semester finals)			T3: Start of second semester (T4: After second-semester finals)		
	M	*SD*	α	*M*	*SD*	α
Perceptions of school/classroom mastery goal structures						
General school	3.37	0.63	.73	3.20	0.65	.73
Korean class	3.25	0.65	.77	3.13	0.68	.79
English class	3.52	0.70	.80	3.34	0.73	.81
Math class	3.44	0.70	.80	3.33	0.71	.80
Perceptions of school/classroom performance goal structures						
General school	2.55	0.75	.84	2.74	0.66	.78
Korean class	2.09	0.62	.90	2.19	0.80	.91
English class	1.95	0.67	.92	2.32	0.72	.92
Math class	1.97	0.68	.92	2.19	0.73	.90
Academic self-efficacy						
General academic	3.39 (3.91)	0.65 (0.63)	.81 (.83)	3.56 (3.64)	0.65 (0.66)	.84 (.88)
Korean	3.19 (3.59)	0.69 (0.74)	.86 (.89)	3.27 (3.60)	0.72 (0.75)	.88 (.91)
English	3.35 (3.93)	0.78 (0.79)	.89 (.93)	3.55 (3.89)	0.75 (0.77)	.94 (.90)
Math	3.41 (3.88)	0.78 (0.78)	.90 (.92)	3.48 (3.76)	0.80 (0.80)	.91 (.95)
Mastery goal						
General academic	3.35	0.61	.61	3.51	0.65	.61
Korean	2.91	0.71	.74	2.98	0.79	.80
English	3.20	0.75	.78	3.32	0.79	.80
Math	3.30	0.80	.80	3.38	0.87	.82
Performance-approach goal[a]						
General academic	3.54	0.83	.59	3.52	0.86	.70
Korean	3.20	0.82	.61	3.20	0.91	.76
English	3.44	0.87	.72	3.37	0.94	.78
Math	3.47	0.89	.71	3.43	0.98	.80
Performance-avoid goal						
General academic	—	—	—	2.66	0.77	.65
Korean	—	—	—	2.52	0.77	.74
English	—	—	—	2.73	0.86	.78
Math	—	—	—	2.74	0.88	.78
Task value						
General academic	2.94	0.71	.68	2.79	0.74	.75
Korean	2.90	0.78	.73	3.71	0.79	.79
English	3.62	0.81	.76	2.78	0.83	.71
Math	3.08	0.95	.78	2.89	0.97	.82
Achievement[b]						
Korean	64.48	10.85	—	66.08	11.57	—
English	70.48	17.87	—	66.45	18.73	—
Math	56.82	22.93	—	60.58	23.87	—

Note. $N = 375$. T = Time. Only academic self-efficacy was assessed at T2 and T4.
[a] Variables were not assessed at T1. [b] Scores could range between 0 and 100. Response scales for all other variables ranged between 1 and 5. Reliability of achievement data could not be estimated because the school did not provide item–level scores.

$p < .001$, $\eta^2 = .45$; and math, $F(3, 372) = 60.94$, $p < .001$, $\eta^2 = .33$. Both the linear and the cubic trends were significant, with the latter being stronger in all learning contexts,[1] which indicates that students' self-efficacy beliefs fluctuated considerably despite the overall increase from T1 to T4. Figure 1 illustrates this pattern. Paired-samples *t* tests demonstrated that the increase from T1 to T2, $ts(374) > |10.63|$, the decrease from T2 to T3, $ts(374) > |8.96|$, and the increase again from T3 to T4, $ts(374) > |2.63|$, were significant in all learning contexts ($ps < .001$). Students' self-efficacy increased significantly in all specific and general academic domains after students took their first-semester final examinations. However, their self-efficacy plunged significantly before the second-semester midterm exams. Students reported significantly increased self-efficacy again after they took their second-semester final exams.

In sum, the hypothesis that there would be negative motivational changes from the first to the second semester across major examinations in the form of decreased mastery goals, self-efficacy, and task value, and increased performance-approach goals did not receive support.

[1] $F_{cubic} = 179.72$ ($\eta^2 = .33$) versus $F_{linear} = 12.81$ ($\eta^2 = .03$) in general school learning, $F_{cubic} = 137.08$ ($\eta^2 = .27$) versus $F_{linear} = 52.83$ ($\eta^2 = .12$) in Korean, $F_{cubic} = 205.76$ ($\eta^2 = .36$) versus $F_{linear} = 90.08$ ($\eta^2 = .19$) in English, and $F_{cubic} = 164.50$ ($\eta^2 = .31$) versus $F_{linear} = 24.56$ ($\eta^2 = .06$) in math ($ps < .001$). The quadratic trends were also significant in general school learning, $F_{quadratic} = 105.41$ ($\eta^2 = .22$), English, $F_{quadratic} = 21.03$ ($\eta^2 = .05$), and math, $F_{quadratic} = 13.26$ ($\eta^2 = .03$, $ps < .001$), but were not as pronounced as the linear or the cubic trends, except for the general school learning. Degrees of freedom for all $Fs = 1, 374$. The smallest increase from T3 to T4 in general school learning appeared to strengthen the quadratic trend in that context.

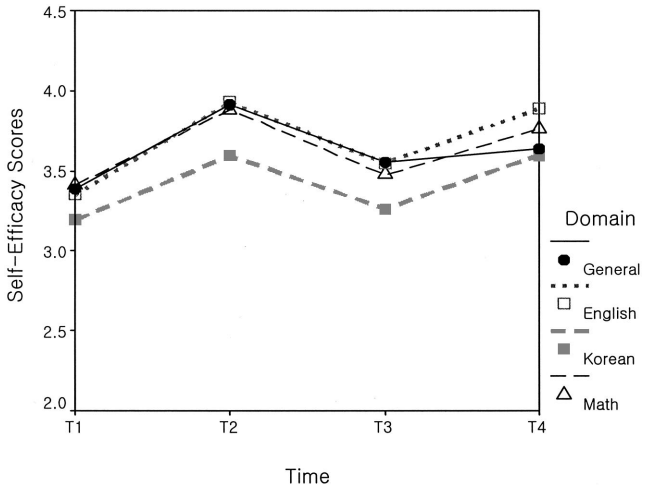


Figure 1. Mean-level changes in students' academic self-efficacy beliefs. T = Time.

CFAs

CFA models were fitted separately within each context. Students' responses to survey items served as indicators of the latent motivation and environment perception variables. The final exam scores in Korean, English, and math served as indicators of achievement in their respective domains. All three scores served as indicators of the general school achievement. To avoid obtaining inflated parameter estimates, I incorporated correlated error paths between the same indicators (i.e., survey items) assessed at multiple times. Additional error covariances were incorporated, for instance, between perceived importance and usefulness items of the task value construct and items that shared similar wording, as suggested by modification indexes. In addition to the chi-square statistic, the Bentler–Bonett nonnormed fit index (NNFI), comparative fit index (CFI), and average absolute covariance residuals (res.) were considered in assessing the model fit. All factor loadings, factor variances, and error variances were statistically significant at $p < .05$. Tables 2 and 3 present correlation coefficients among the latent variables.

Several findings are noteworthy. First, the pattern of correlation among the variables was largely consistent across contexts and with prior research. At each assessment point, perceptions of the mastery goal structures were negatively correlated with perceptions of the performance goal structures ($-.30 \leq \phi s \leq -.55$). Whereas the former showed consistent positive correlation with students' mastery goals, self-efficacy, and task value ($.22 \leq \phi \leq .57$), the latter demonstrated negative or nonsignificant correlation with those same variables ($-.31 \leq \phi \leq .06$). Students' personal mastery goals displayed positive correlation with performance-approach goals ($.12 \leq \phi \leq .47$) and nonsignificant negative correlation with performance-avoid goals ($-.09 \leq \phi \leq -.01$).

Second, performance-avoid goals at T3 demonstrated strong positive correlation with the performance-approach goals assessed concurrently ($.58 \leq \phi s \leq .67$). As students' performance-approach goals increased, their performance-avoid goals also increased during the second semester. In comparison, students' performance-avoid goals at T3 correlated only moderately with their performance-approach goals at T1 ($.28 \leq \phi s \leq .36$).

Table 2
Correlation Coefficients Among Latent Variables in General School Learning and Korean

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. T1 school/classroom mastery goal structure	—	**.57**	−.40	−.29	.43	.18	.34	.20	.14	.49	.17	.26	.19	.56	.29	.21	.19
2. T3 school/classroom mastery goal structure	**.61**	—	−.14	−.44	.28	.39	.30	.34	.23	.35	.20	.47	.31	.34	.49	.11	.13
3. T1 school/classroom performance goal structure	−.53	−.30	—	**.34**	−.22	−.09	−.09	−.07	−.00	−.15	−.10	−.06	−.10	−.28	−.12	−.07	−.07
4. T3 school/classroom performance goal structure	−.16	−.50	**.40**	—	−.15	−.11	−.15	−.13	.02	−.12	−.17	−.12	−.11	−.13	−.18	−.07	−.11
5. T1 mastery goal	.43	.28	−.12	−.05	—	**.57**	.35	.16	−.07	.68	.37	.42	.22	.89	.59	.00	.07
6. T3 mastery goal	.31	.37	−.07	−.03	**.58**	—	.13	.26	−.01	.49	.37	.71	.27	.63	.86	.08	.10
7. T1 performance-approach goal	.17	.11	.04	−.07	.12	.15	—	**.63**	.36	.42	.21	.25	.23	.47	.24	.05	.11
8. T3 performance-approach goal	.10	.11	−.01	.02	.10	.22	**.61**	—	.65	.19	.14	.29	.16	.27	.29	.09	.12
9. T3 performance-avoid goal	.07	.05	.02	.08	−.05	−.09	.35	.67	—	−.04	−.05	−.01	.02	.04	.02	−.06	−.07
10. T1 self-efficacy	.47	.30	−.23	−.11	.55	.36	.31	.12	−.16	—	**.53**	**.65**	**.46**	.71	.50	.12	.15
11. T2 self-efficacy	.19	.17	−.08	−.06	.38	.37	.22	.26	−.08	**.57**	—	.58	.54	.33	.37	.09	.09
12. T3 self-efficacy	.22	.26	−.06	.02	.30	.52	.30	.32	−.04	**.62**	**.58**	—	**.61**	.47	.72	.13	.14
13. T4 self-efficacy	.19	.28	−.01	−.11	.25	.33	.32	.30	−.05	**.57**	**.55**	**.64**	—	.17	.26	.01	.00
14. T1 task value	.57	.47	−.31	−.15	.90	.61	.37	.26	−.05	.58	.37	.36	.33	—	**.66**	.03	.14
15. T3 task value	.30	.36	−.05	.00	.56	.94	.17	.17	−.11	.29	.30	.43	.30	**.50**	—	.18	.19
16. T1 achievement	.05	.09	−.03	.01	.07	.11	.11	.12	−.12	.22	.21	.29	.18	.22	.12	—	**.68**
17. T3 achievement	.05	.09	−.05	−.03	.11	.12	.11	.15	−.13	.23	.21	.26	.16	.23	.17	**1.00**	—

Note. Coefficients in general school learning below diagonal, $\chi^2(2140, N = 375) = 3{,}149.56$, $p < .001$ (NNFI = .91, CFI = .92, res. = .04); coefficients in Korean above diagonal, $\chi^2(1876, N = 375) = 2{,}998.50$, $p < .001$ (NNFI = .91, CFI = .92, res. = .03). Boldfaced numbers are stability coefficients. $|\phi| \geq .15$ is significant at $p < .05$. T = Time; NNFI = nonnormed fit index; CFI = confirmatory factor analysis; res. = absolute covariance residual.

Table 3
Correlation Coefficients Among Latent Variables in English and Math

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. T1 school/classroom mastery goal structure	—	**.44**	−.35	−.13	.46	.25	.30	.08	−.00	.44	.29	.27	.10	.46	.27	.01	.01
2. T3 school/classroom mastery goal structure	**.33**	—	−.08	−.30	.29	.46	.18	.21	.06	.30	.13	.34	.15	.29	.34	−.08	−.03
3. T1 school/classroom performance goal structure	−.55	−.22	—	**.37**	.01	.03	.03	−.01	−.00	−.15	−.12	.01	−.00	.04	.04	.30	.30
4. T3 school/classroom performance goal structure	−.12	−.50	**.23**	—	−.05	−.02	.05	.01	.12	−.05	.04	−.00	.11	−.01	.00	.35	.29
5. T1 mastery goal	.55	.15	−.28	.02	—	**.71**	.47	.23	−.04	.69	.50	.61	.37	.92	.73	.22	.19
6. T3 mastery goal	.28	.41	−.07	−.06	**.63**	—	.43	.42	−.01	.54	.44	.73	.39	.73	.91	.26	.26
7. T1 performance-approach goal	.40	.16	−.20	.04	.45	.35	—	**.62**	.30	.43	.37	.44	.30	.54	.44	.24	.22
8. T3 performance-approach goal	.11	.29	−.04	.01	.11	.39	**.61**	—	.58	.23	.25	.41	.28	.32	.38	.16	.17
9. T3 performance-avoid goal	.04	.21	.09	.03	−.16	−.02	.28	.62	—	−.04	−.11	.02	−.05	.06	−.02	.02	−.04
10. T1 self-efficacy	.39	.01	−.24	.14	.73	.52	.48	.18	−.10	—	**.54**	**.65**	**.46**	.75	.59	.12	.13
11. T2 self-efficacy	.16	.04	−.09	.08	.39	.43	.33	.23	−.07	**.60**	—	**.61**	**.58**	.49	.49	.18	.18
12. T3 self-efficacy	.15	.22	−.09	.06	.46	.70	.37	.37	−.08	**.64**	**.60**	—	**.55**	.60	.78	.21	.21
13. T4 self-efficacy	.11	.18	−.08	.09	.27	.35	.22	.25	−.04	**.50**	**.49**	**.58**	—	.35	.41	.25	.25
14. T1 task value	.51	.09	−.22	.05	.84	.58	.44	.20	−.05	.78	.38	.46	.27	—	**.77**	.24	.20
15. T3 task value	.25	.33	−.05	−.06	.58	.82	.33	.34	−.03	.49	.43	.70	.42	**.59**	—	.31	.29
16. T1 achievement	−.07	−.07	.05	.20	.16	.29	.12	.09	−.10	.26	.29	32	.17	.16	.28	—	**.68**
17. T3 achievement	−.07	−.04	.04	.12	.20	.27	.12	.12	−.11	.26	.25	.30	.13	.21	.27	**.78**	—

Note. Coefficients in English below diagonal, $\chi^2(1876, N = 375) = 2{,}825.36$, $p < .001$ (NNFI = .94, CFI = .94, res. = .04); coefficients in math above diagonal, $\chi^2(1876, N = 375) = 2{,}875.66$, $p < .001$ (NNFI = .94, CFI = .94, res. = .04). Boldfaced numbers are stability coefficients. $|\phi| \geq .12$ is significant at $p < .05$. T = Time; NNFI = nonnormed fit index; CFI = confirmator absolute analysis; res. = covariance residual.

Third, the task value variable in each domain correlated very highly with the mastery goal variable (ϕs = .91 and .94 in general school learning, .89 and .86 in Korean, .84 and .82 in English, and .92 and .91 in math at T1 and T3, respectively). To test whether the two constructs were empirically distinguishable, one- and two-factor models were specified with the mastery goal and task value indicators. The two-factor model better approximated the data in Korean, English, and math at both T1 and T3, as indicated by significantly reduced chi-square values ($8.43 \leq \Delta\chi^2 \leq 38.60$, ps $<$ .05), higher NNFI and CFI, and smaller residuals compared with those from the one-factor model. Nevertheless, including both constructs in the analyses would likely create a methodological problem, such as linear dependency, because of the substantial variance overlap. Also, there was no significant difference in fit between the one- and two-factor models in general school learning at either T1 or T3, $\Delta\chi^2 < 3.84$, ps > 05. For these reasons, and to make findings more comparable to the existing research, I excluded task value variables from the SEM analyses.

SEM

Relative stability of perceptions and motivation. SEMs were specified with the T1 and T3 perception and motivation variables within each domain. The postexam (i.e., T2 and T4) self-efficacy variables were not included in these analyses because they would render tests of relative stability inaccurate as a result of their shorter assessment intervals. To test relative stability of the latent variables, I first imposed equality constraints on all stability paths in the model. Each subsequent model released one equality constraint at a time (hence, $\Delta df = 1$), according to the La Grange multiplier tests, until none of the remaining paths was statistically different from each other. Table 4 reports stability coefficients from the final models.[2]

In the general school context, the stability coefficient of the perceived school performance goal structure ($\gamma = .43$) was significantly lower than were those of the perceived school mastery goal structure ($\gamma = .68$) or personal motivation ($.62 \leq \gamma$s $\leq .76$), $\Delta\chi^2 = 6.66$, $p < .05$. Students' perceptions of the school performance goal structure fluctuated more from the first to the second semester across major examinations than did their perceptions of the school mastery goal structure or personal motivation. The stability coefficients of the rest of the variables did not differ significantly.

A consistent pattern was observed in three specific subject domains. As was the case at the general school level, the stability coefficients of the classroom performance goal structures (γs = .38, .25, and .39) were significantly lower than were those of the classroom mastery goal structures (γs = .60, .48, and .51) or personal motivation variables ($.59 \leq \gamma$s $\leq .75$), $\Delta\chi^2$s = 9.31, 12.14, and 9.89 in Korean, English, and math, respectively (ps $<$ .05; see Table 4). Students' perceptions of the performance goal structure changed more over time than did their perceptions of the

[2] Stability coefficients from these final models were compared with the coefficients from the models with no equality constraints. The differences were miniscule, ranging from .001 to .069, with 19 out of the 20 differences less than .033 in absolute values (both the average and median difference = .016). Therefore, only those from the models with equality constraints are reported.

Table 4
Stability Path Coefficients From Time 1 to Time 3 Perception and Motivation Variables

Variable	General school	Korean	English	Math
Perceptions of the environment				
School/classroom mastery goal structure	$.68_b$	$.60_b$	$.48_b$	$.51_b$
School/classroom performance goal structure	$.43_a$	$.38_a$	$.25_a$	$.39_a$
Personal motivation				
Mastery goal	$.76_b$	$.68_c$	$.73_c$	$.75_c$
Performance-approach goal	$.66_b$	$.67_b$	$.59_b$	$.64_b$
Self-efficacy	$.62_b$	$.65_b$	$.64_b$	$.66_b$

Note. Coefficients in the same column that do not share subscripts differ at $p < .05$. $\chi^2(915, N = 375) = 1{,}644.97$, $p < .001$ (NNFI = .88, CFI = .89, res. = .04) in general school; $\chi^2(914, N = 375) = 1{,}917.08$, $p < .001$ (NNFI = .88, CFI = .89, res. = .04) in Korean; $\chi^2(914, N = 375) = 1{,}782.78$, $p < .001$ (NNFI = .91, CFI = .92, res. = .05) in English; $\chi^2(914, N = 375) = 1{,}752.94$, $p < .001$ (NNFI = .91, CFI = .92, res. = .05) in math. NNFI = nonnormed fit index; CFI = confirmatory factor analysis; res. = absolute covariance residual.

mastery goal structure in the same subject domain. Although there was no significant difference between the stability coefficients of the perceived classroom mastery goal structures and those of the personal performance-approach and self-efficacy variables, personal mastery goals were associated with significantly higher stability coefficients in all three subject domains, $\Delta\chi^2$s = 17.59, 23.42, and 21.20 in Korean, English, and math, respectively (ps < .05). Therefore, in specific subject domains, students' personal mastery achievement goals were most stable from the first to the second semester across major performance feedback, followed by their personal performance-approach goals, their self-efficacy beliefs, and their perceptions of the classroom mastery goal structures. Students' perceptions of the classroom performance goal structures were least stable across major examinations. The hypothesis that perceptions of the environment would be less stable than personal achievement goals was only partially supported.

Consistency of relations across domains. A full SEM with all latent variables except for task value was fitted within each domain. To test the consistency of overall relations among the variables across domains, an identical model structure was replicated in all specific and general learning contexts. Students' perceptions of the environment assessed in the first semester (T1) were specified to explain their personal motivation within the same semester. Students' personal motivation was in turn specified to predict their end-of-semester exam performance. Students' T1 personal motivation and achievement predicted their postexam (T2) self-efficacy. The same predictive paths were repeated with the second-semester variables. All T3 variables had their T1 counterpart, T1 achievement, and T2 self-efficacy as additional predictors. All earlier self-efficacy variables were predictors of later self-efficacy variables.

Multiple goodness-of-fit indexes, including NNFI, CFI, and res., were inspected to determine whether the specified model could be regarded as a satisfactory approximation of the data. Because the chi-square statistic as a fit index is often misleading because of its sensitivity to sample size (Chou & Bentler, 1995), the χ^2/df ratio was used instead. Given the present sample size ($N > 250$), it was deemed appropriate to apply conventional criteria (i.e., $\chi^2/df < 3$, NNFI > .90, CFI > .90, res. < .10) for evaluating the model fit (Kline, 1998). The specified model structure generated acceptable fit indexes in all specific and general learning contexts, $\chi^2(1{,}849, N = 375) = 2{,}904.30$, $p < .001$, $\chi^2/df = 1.57$, NNFI = .90, CFI = .90, res. = .04, in general school; $\chi^2(1{,}608, N = 375) = 2{,}677.08$, $p < .001$, $\chi^2/df = 1.66$, NNFI = .91, CFI = .92, res. = .04, in Korean; $\chi^2(1{,}608, N = 375) = 2{,}571.33$, $p < .001$, $\chi^2/df = 1.60$, NNFI = .93, CFI = .94, res. = .05, in English; and $\chi^2(1{,}608, N = 375) = 2{,}601.60$, $p < .001$, $\chi^2/df = 1.62$, NNFI = .93, CFI = .94, res. = .06, in math. These values signify a coherent pattern of relations among the variables in all specific and general learning contexts.

Despite the uniform pattern of overall relations, individual parameters could and did differ in terms of their statistical significance. Figure 2 presents statistically significant paths among the latent variables in general school learning and Korean. Figure 3 presents those in English and math. Coefficients for the stability paths are presented separately in Table 5 for clarity. It should be noted that the magnitude of the coefficients in Table 5 is smaller compared with that of the stability coefficients reported in Table 4, because the variances attributable to all T1 and T2 predictors were partialed out from the T3 and T4 variables in Table 5. The reduction is more substantial for the personal motivation variables because they had the T3 classroom perceptions as additional predictors.

A number of significant paths emerged consistently in all or most of the domains. Consistent with prior research, students' perceptions of the mastery goal structures in the environment related positively to their self-efficacy and personal mastery goal orientations in all specific and general learning contexts during the first semester. Increases in the perceived mastery emphasis in the environment were further associated with increases in self-efficacy and personal mastery goals during the second semester. Somewhat surprisingly, perceived mastery goal structures also demonstrated positive links to personal performance-approach goals in all domains during the first semester and both performance-approach and performance-avoid goals in specific subject domains during the second semester. Also consistent with previous reports, students' self-efficacy in the beginning of the school year (T1) predicted their end-of-semester performance in Korean, English, and general school learning. The first-semester achievement in turn positively predicted the second-semester (T3) self-efficacy in English, math, and general school learning. Students' self-efficacy beliefs assessed after the first-semester final exams (T2) positively predicted their subsequent mastery goal orientations in all domains. Increases in students' performance-approach goals in the first-semester predicted increases in their second-semester performance-avoid goals in all domains. Students' postexam self-efficacy beliefs predicted decreases in students' second-semester performance-avoid goals in the contexts of English, math, and general school learning.

In the present research, the relationships between students' perceptions of the performance goal structures in the environment and their personal performance-oriented achievement goals were hypothesized to be stronger at the general school level than in specific subject domains. This hypothesis was not supported. At T1, the perceived performance goal structures demonstrated significant positive relations with personal performance-approach goals in general school learning ($\gamma = .16$) and math ($\gamma = .17$).

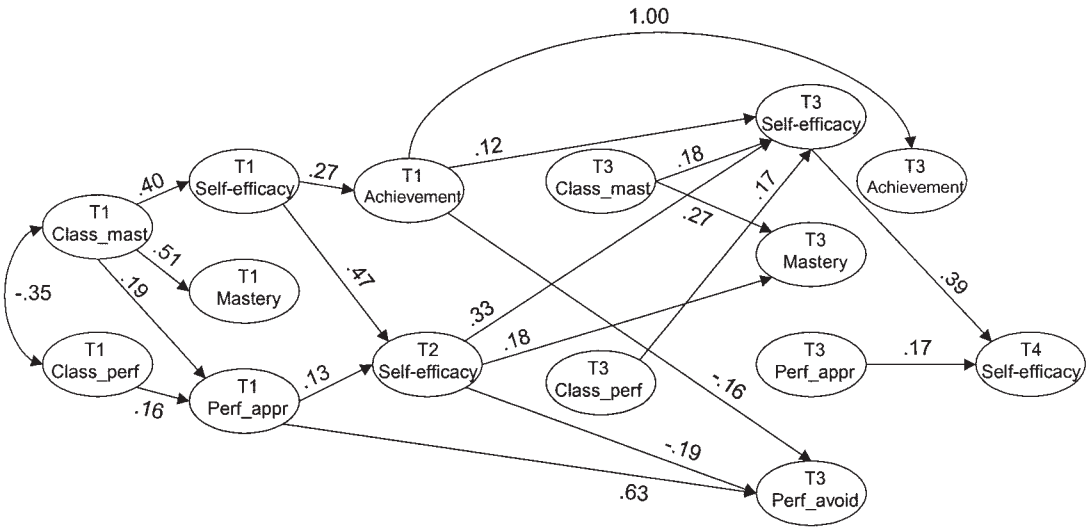
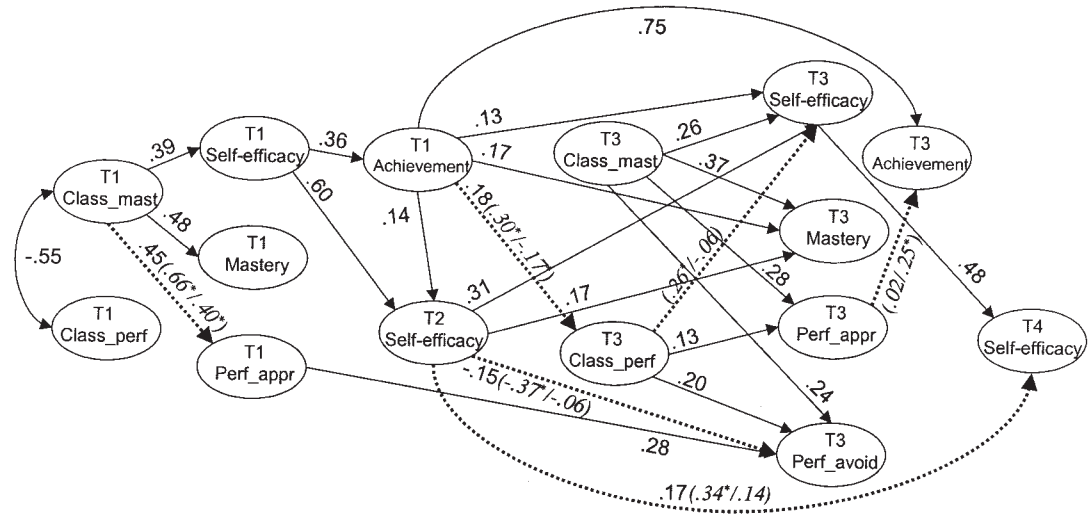


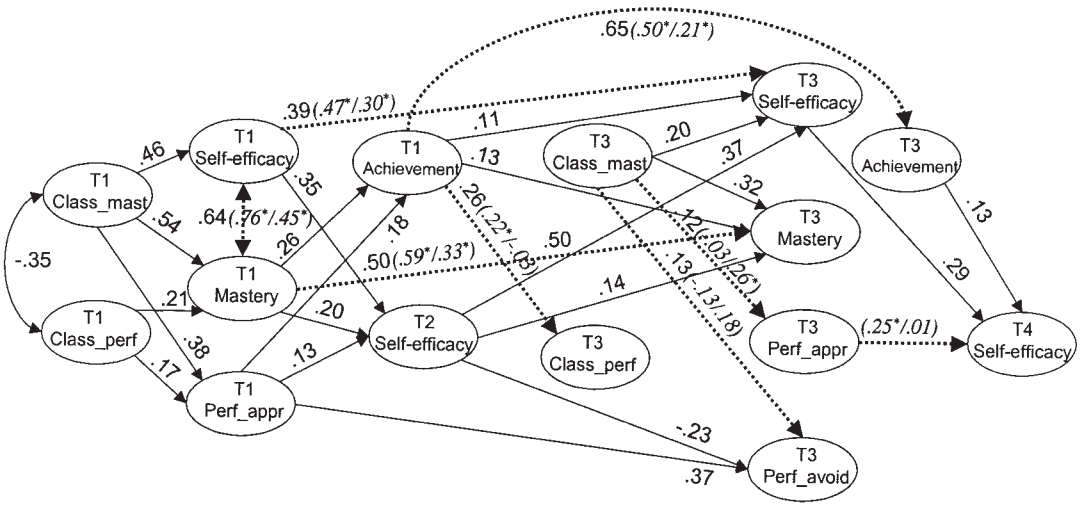
Figure 2. Statistically significant paths in domains without ability tracking. T = Time; class_mast = classroom mastery goal structure; class_perf = classroom performance goal structure; perf_approach = performance-approach goal structure; perf_avoid = performance-avoid goal structure.

However, at T3, the significant positive relations with personal performance-approach (β = .13) and performance-avoid goals (β = .20) remained only in English.

It was also hypothesized that changes in students' perceptions of their learning environment would explain changes in their personal motivation within the school year. This hypothesis received empirical support. As discussed above, the changes in the perceived school and classroom mastery goal structures at T3 related positively to the changes in students' self-efficacy and mastery achievement goals in all learning contexts (see Figures 2 and 3). In



English



Math

Figure 3. Statistically significant paths in domains with ability tracking. Dotted lines indicate statistically different paths between the upper and lower tracks. Path coefficients for the upper tracks are presented first in the parentheses (* $p < .05$). T = Time 1; class_mast = classroom mastery goal structure; class_perf = classroom performance goal structure; perf_approach = performance-approach goal structure; perf_avoid = performance-avoid goal structure.

three specific subject domains, the changes in classroom mastery goal structures also linked positively to the changes in students' performance-approach goals and their second-semester performance-avoid goals. The changes in the perceived performance goal structures at T3 related positively to the changes in students' self-efficacy in general school learning and Korean, providing some support for the hypothesized role of the performance goal structures as a positive motivator for girls. In English, the in-

Table 5
Stability Path Coefficients From Structural Equation Models With All Variables

Variable	General school	Korean	English	Math
T1–T3 school/classroom mastery goal structure	.63	.53	.32	.44
T1–T3 school/classroom performance goal structure	.42	.36	.23	.32
T1–T3 mastery goal	.47	.47	.48	.50
T1–T3 performance-approach goal	.76	.58	.53	.56
T1–T3 self-efficacy	.37	.35	.39	.39
T2–T4 self-efficacy	.19	.25	.17	.33

Note. Time (T) 3 self-efficacy had T2 self-efficacy as an additional predictor. T4 self-efficacy had T1 and T3 self-efficacy as additional predictors.

creased perceptions of the classroom performance goal structures explained the increases in students' performance-approach goals and their performance-avoid goals at T3.

To further verify the relative advantage of using the changed perceptions of the environment as predictors of students' changed motivation, supplementary analyses were conducted without the second-semester school/classroom perception variables. Students' motivation and achievement in both the first and second semesters were hence predicted only by their first-semester contextual perceptions. These analyses yielded only a few significant paths between students' perceptions of the goal structures assessed at the start of the first semester and changes in their personal motivation during the second semester assessed after the first-semester final exams. Negative paths emerged between students' earlier perceptions of the mastery goal structures and their later performance-approach goals in English, math, and general school learning. A positive path was obtained in math between the first-semester perceptions of the classroom performance goal structures and the second-semester (T3) self-efficacy. None of the links was significant in Korean. Therefore, students' initial impression of the environment was not able to predict changes in students' motivation during the second semester as well as students' modified perceptions of the same learning environment.

Consistency of relations across ability tracks. I performed multigroup SEMs in English and math to examine whether there existed a difference in how the constructs related to one another between students at different achievement levels. Only students who belonged to one of the upper or lower ability-track classes in both semesters were included in these analyses. All factor loadings, factor variances, and structural coefficients (i.e., factor covariances, path coefficients, and disturbance covariances) were constrained to be equal across the upper and lower ability-track groups. Each subsequent model released one equality constraint at a time (i.e., $\Delta df = 1$) until none of the constrained parameters was statistically different between the groups. In English, 13 parameters proved to be different between the upper ($n_1 = 148$) and the lower ability-track groups ($n_2 = 143$), $\chi^2(3, 305) = 4{,}789.24$, $p < .001$, NNFI = .87, CFI = .88, res.$_1$ = .07, res.$_2$ = .06, of which 6 were structural coefficients. In math, 13 parameters again were different between the upper ($n_1 = 175$) and the lower ($n_2 = 165$) ability-track groups, $\chi^2(3, 295) = 4{,}959.14$, $p < .001$, NNFI = .88, CFI = .89, res.$_1$ = .07, res.$_2$ = .06, of which 7 were structural coefficients. Statistically different paths between the groups are incorporated as dotted lines in Figure 3.

Supporting the hypothesis, students who stayed in the upper ability-track classes generally demonstrated more stable achievement and adaptive motivation compared with those staying in the lower track, as evinced by the statistically stronger paths from the T2 to T4 self-efficacy in English ($\beta = .34$ vs. .14) and from the T1 to T3 self-efficacy ($\beta = .47$ vs. .30), mastery goals ($\beta = .59$ vs. .33), and achievement in math ($\beta = .50$ vs. .21). Increases in the final exam scores led to increases in the perceived classroom performance goal structures only for the upper track students in both domains (βs = .30 and .22 in English and math, respectively), which subsequently led to increased self-efficacy in English for these students ($\beta = .26$).

In English, students' postexam self-efficacy led to lower performance-avoid goals for the upper track students ($\beta = -.37$), whereas stronger performance-approach goals led to better second-semester final exam performance for the lower-track students ($\beta = .25$). In math, the perceptions of the classroom mastery goal structures at T3 did not relate significantly to the upper track students' performance-approach or performance-avoid goals, but they showed a significant positive link to the performance-approach goals of the lower track students ($\beta = .26$). However, it was the performance-approach goals of the upper track students that led to the stronger postexam self-efficacy ($\beta = .25$). There was no evidence to support the hypothesis that low-achieving girls would respond more negatively to the perceived classroom performance goal structures than would their better-achieving peers.

Academic self-efficacy as a mediator. Significant paths linking the T1 achievement, T2 self-efficacy, and T3 achievement goals would constitute evidence of self-efficacy mediation. In contrast, those linking the T1 achievement, T3 achievement goals, and T4 self-efficacy (or via T3 achievement) would constitute evidence of achievement goal mediation. In English, the T1 achievement predicted postexam self-efficacy ($\beta = .14$), which in turn positively predicted the T3 mastery goals ($\beta = .17$) and negatively predicted the T3 performance-avoid goals ($\beta = -.15$). The T1 achievement in the remaining domains did not relate significantly to the T2 self-efficacy. Nevertheless, the postexam self-efficacy positively predicted subsequent mastery goals in all remaining domains (βs = .18, .17, and .14 in general school learning, Korean, and math, respectively) and negatively predicted subsequent performance-avoid goals in general school learning ($\beta = -.19$) and math ($\beta = -.23$). Although significant direct paths were observed from the T1 exam performance to the T3 mastery goals in English ($\beta = .17$) and math ($\beta = .13$) as well as the T3 performance-avoid goals in general school learning ($\beta = -.16$), none of these personal achievement goals predicted either students' subsequent achievement or their self-efficacy.

Discussion

The present research clearly demonstrated that students do modify their perceptions of the learning environment throughout the school year. Not only did the Korean high school girls in the present study adjust their impression of the goals emphasized in their school and specific subject classes from the first to the second semester, these changes in their perceptions of the environment explained important changes in their personal motivation. The results extend findings from the middle school transition studies

(Anderman & Midgley, 1997; Harter et al., 1992; Urdan & Midgley, 2003) to the high school years and demonstrate that students keep reacting to the environmental presses long after their first encounter with the secondary schooling.

Changes in Perceptions of the Environment and Personal Motivation Within the School Year

The first objective of the present research was to examine whether significant within-grade changes occurred in students' perceptions of the learning environment and their personal motivation. The Korean high school girls who participated in this research generally perceived a decreased mastery goal emphasis in their learning environment from the first to the second semester. The decrease was significant in the general school environment and English classes. In contrast, the same high school girls reported a significantly heavier stress on relative ability and competition in their general school environment as well as the three core subject classes examined in this study. Because the significant increase in students' perceptions of the performance goal structures took place in all specific and general learning contexts, the between-classroom ability grouping conducted only in English and math cannot adequately explain these changes. Rather, the increases more likely embodied students' responses to regular classroom events, including the evaluative feedback on their first-semester final examinations.

According to Ames (1992), evaluation is the most salient factor affecting student motivation in the classroom. Testing and grading in Korean secondary classrooms are highly competitive and unidimensional (Bong, 2003, 2004b). It is not surprising that students gradually perceive a reduced mastery focus and a heightened performance emphasis in this type of learning environments. Along with Harter et al.'s (1992) report that, compared with the sixth and seventh graders in the sample, the eighth graders exhibited the largest increase in their perceptions of the external emphasis on grades and social comparison, the present results introduce a disconcerting possibility that such perceptions become stronger during each year of secondary schooling.

Despite these changes in the perceived environment, the Korean high school girls neither significantly lowered their personal mastery achievement goals nor significantly raised their personal performance-approach goals within the school year. The girls increased their personal mastery goals significantly, however, in the context of general school learning. Within-grade changes in their task value beliefs also fell short of attaining statistical significance. Corroborating these results, students' personal motivational beliefs as a whole were significantly more stable than were their perceptions of the performance focus in the environment. Middle school transition studies demonstrated that significant changes in the perceived classroom goal structures were usually accompanied by corresponding changes in students' personal motivation (e.g., Anderman & Midgley, 1997; Urdan & Midgley, 2003). However, personal performance goal orientations often remained unchanged even during these early years. The present results suggest that even lesser changes may take place in older students' motivational beliefs.

In light of these results, the significant fluctuations in students' self-efficacy beliefs within the school year are noteworthy. Self-efficacy was the only personal motivation variable in this investigation associated with significant time-related changes in all specific and general learning contexts. The pattern of its variation, which was identical across domains, was particularly interesting. The girls raised their self-efficacy after taking the exams and lowered their self-efficacy before taking the exams. On one hand, the heightened self-efficacy beliefs after the achievement testing confirm the power of enactive mastery experiences as the most potent source of efficacy information. On the other hand, the significantly weakened efficacy judgments before the tests support the claim that percepts of efficacy tend to waver as performance occasions become imminent (Bandura, 1997). The ability of these high school girls' self-efficacy beliefs to successfully predict their subsequent performance as well as changes in their achievement goal orientations likely are due to the highly context-dependent nature of efficacy appraisals.

Changed Perceptions of the Environment as Predictors of Personal Motivational Changes

The second objective of this research was to test whether within-grade changes in the perceived learning environments could explain changes in students' personal motivation. Supporting Meece and Miller's (2001) conjecture, the present study established the utility of students' altered perceptions of the environment for explaining changes in their motivation within the school year. In all specific and general learning contexts, the increase in the Korean high school girls' perceptions of the mastery goal structures from the first to the second semester accounted for the increase in their self-efficacy and personal mastery goals. Within specific subject classes, the same changes in the perceived classroom mastery goal structures also explained the changes in their performance-approach and performance-avoid goals.

It is remarkable that significant explanatory paths were obtained even in the presence of the strong stability in these high school girls' personal motivation. Students' achievement goals and task value beliefs did not change significantly within the same grade level, except for their self-efficacy beliefs and their mastery goals in general school learning. Nevertheless, the changed perceptions of the environment still managed to explain the changes in the high school girls' subsequent motivation, after taking into account their earlier perceptions of the environment, prior achievement, and prior motivation. The girls' initial impression of their learning environment could not explain their motivational changes as well as did their modified perceptions of the contexts. Therefore, researchers who aim to better understand the impact of these perceptions on students' motivational changes are urged to assess students' perceptions of the environment more than once within the school year. Multiple assessments of perceived learning environments appear especially essential when major classroom events such as achievement testing intervene.

The greater number of explanatory paths and the more consistent pattern exhibited by the perceived mastery goal structures, compared with those associated with the perceived performance goal structures, are also noteworthy. The results support Urdan and Midgley's (2003) claim that it is the change in the mastery, not performance, goal structures in the environment that is more consequential for students' continuing motivation. Assuming the Korean high school classrooms to which the participants belonged were as heavily oriented toward ability and performance as I conjectured (Bong, 2003, 2004b), and given the significant increase in the perceived performance goal structures in all learning

contexts throughout the school year, these results are powerful evidence that mastery-oriented messages even in these highly and increasingly competitive learning environments could produce positive student outcomes. Though some of the specific paths are in conflict with previous reports (which is discussed below), it is notable that the high school girls' perceptions of the task mastery emphasis in their school and specific subject classes functioned as a significant predictor of their initial, as well as their subsequent, motivation within those contexts.

Motivational Relations Across Domains and Achievement Levels

The third objective of this study was to test consistency of motivational relations across multiple learning contexts and achievement levels. In the present research, the single a priori model relating students' earlier perceptions of the environment, motivation, and performance to their later perceptions, motivation, and performance was judged to be an adequate representation of the empirical data in all domains. A number of studies already discovered similar cross-domain relations among key motivational constructs (Anderman & Midgley, 1997; Bong, 2001; Wolters et al., 1996; Wolters & Pintrich, 1998). The current results expand this literature by confirming the relational consistency across multiple specific as well as more general achievement contexts.

In general, the within-time point relations between perceived goal structures in the environment and students' personal motivational beliefs were consistent with existing research. Nonetheless, some of the findings contradict those from previous reports and require further explanation. The most conspicuous difference is the significant positive paths from students' perceptions of the mastery goal structures to their personal performance-approach and performance-avoid achievement goals. On the basis of the proposals that girls are more willing to please others (Pomerantz et al., 2002) and readily accept external evaluations as diagnostic of their abilities (Roberts, 1991), it was suspected that the performance goal pressure in the environment might operate as a positive, rather than a negative, motivator for the present sample of Korean high school girls. Some evidence for this hypothesis was obtained in the positive paths between the perceived performance goal structures and personal mastery goals and self-efficacy. The girls' stronger desire to please significant adults might also explain the unexpected negative findings regarding the task mastery focus in the environment. As the girls perceived that their teachers emphasized learning and individual progress, they not only strived to accomplish the tasks but also struggled to document their superior abilities and avoid exposing their relative incompetence.

It is speculated that this prosocial tendency of the girls to please adults and conform to the norm might have played out more vividly in this Korean sample. Asian students in general show keen interest in and awareness of others' views and evaluations, which easily translate into heightened concerns about how they are received by others in the relevant social network (Markus & Kitayama, 1991; Oishi & Diener, 2001). More specifically, Kim and Park (2005) reported that for Korean adolescents, parental achievement pressure and a sense of indebtedness toward parents functioned as positive, not negative, predictors of their achievement motivation. Emotional and social support from parents and teachers and feelings of guilt are also important motivators for Korean students (Kim, Park, & Park, 2000). Therefore, the Korean high school girls who felt that their teachers genuinely cared about their learning and improvement might have experienced a stronger desire to prove that they lived up to the teachers' expectations. When they failed to master the tasks successfully, they might have wished to hide their incapability from their teachers so as not to disappoint them. It is interesting that Miller, Green, Montalvo, Ravindran, & Nichols (1996) reported U.S. high school students' goals of pleasing the family and pleasing the teacher also correlated moderately with their performance goals but were unrelated to their learning goals. Their finding provides some credibility to the present interpretation of the positive relationships between perceived mastery goal structures in the environment and personal performance-oriented goals.

When these high school girls were divided into different ability-track groups in math, the positive paths between the mastery goal perceptions in the environment and performance-oriented achievement goals were evident only among those in the lower ability-track classes. This finding contrasts with the path from the girls' reinforced perceptions of the relative ability focus in the environment to their increased self-efficacy, evinced only among those in the higher ability-track classes in English. Wolters (2004) observed a similar trend with U.S. junior high school students when the students in math classrooms with higher average performance goal structures reported higher self-efficacy. Also, there is a hint that students with disparate achievement histories may construe and react to the same mastery and ability messages in their classrooms in different ways (see, e.g., Urdan & Midgley, 2003). It is uncertain, however, whether these achievement-level differences apply to other learning contexts, because findings were not consistent across the two subject domains. Also, the track and teacher effects could not be separated because there was only one teacher per track within each subject area. Future research should test whether the different motivational relations obtained in this study largely represent achievement-level differences or subject domain characteristics.

Academic Self-Efficacy and Performance-Approach Goals in Student Motivation

The results seem to add weight to the hypothesis that changes in self-efficacy occur before changes in achievement goal orientations. Self-efficacy beliefs of the high school girls after they received feedback on their first-semester final exam performance predicted their subsequent self-efficacy and mastery goal orientations at the start of the second semester. These positive paths emerged consistently in the contexts of general school learning and all specific subject classes. Students' postexam self-efficacy also negatively predicted their performance-avoid goal orientations at the beginning of the second semester in all learning contexts but Korean. In contrast, earlier achievement goal orientations could not predict later self-efficacy beliefs to a comparable degree. The end-of-semester exam performance predicted mastery goals in English and math and performance-avoid goals in general school learning, but these postexam achievement goals did not predict subsequent achievement or self-efficacy. The only recurrent paths between earlier achievement goals and later self-efficacy involved performance-approach goals. Stronger performance-approach goals predicted higher self-efficacy in the contexts of general school learning and math classes. Mastery goals occasionally

predicted self-efficacy, but the nature of these relations was not coherent.

The present study is one of a few investigations in which students' achievement goals and self-efficacy beliefs were solicited separately with a time lag and an intervening testing event. The assessment contexts hence simulated laboratory studies in which performance levels are experimentally manipulated. Longitudinal relations from these naturalistic classroom settings suggest, at least for this sample of Korean high school girls, changes in perceived competence preceded changes in achievement goal orientations. In all specific and general academic domains, postexam self-efficacy mediated the effects of preexam self-efficacy on subsequent achievement goals and self-efficacy. Postexam self-efficacy also mediated the effects of exam performance (in English), prior performance-approach goals (in general school learning and math), or prior mastery goals (in math) on subsequent achievement goals and self-efficacy. As the girls felt more efficacious after their semester finals, they tended to start the next semester with stronger self-efficacy, stronger mastery goals, and weaker performance-avoid goals.

It is interesting that investigations with college student populations typically found that perceived competence was neither a mediator (e.g., Elliot & Harackiewicz, 1994) nor a moderator of goal effects (e.g., Harackiewicz et al., 1997). The discrepancy could be due to a number of factors. First, the college-student studies looked at the mediation of goal effects on subsequent interest and performance and not on subsequent goals and self-efficacy as did the present study. Second, and more important, high school students and college students are believed to differ in the manner with which they interpret evaluative feedback, the impact such feedback has on their perceptions of own academic ability, and the centrality of perceived competence in their ensuing motivation. High school students likely take their exam results more seriously than would college students because test scores are an important factor that determines their course grades, which affect their chance of entering desired colleges and universities. Korean students may show especially strong reactions to this type of feedback, given the heavy societal pressure for tertiary education (Bong, 2003). In general, adolescents' perceptions of competence, compared with those of college students, might change to a greater degree after evaluative feedback and trigger different achievement goals. This conjecture is speculative at this point because the performance–efficacy portion of the mediation cycle was not significant in most of the domains.

Other interesting longitudinal relations in this study were the significant positive links from students' earlier performance-approach goals to students' later performance-avoid goals. One of the current debates in the achievement goal orientation research involves the adaptive nature of performance-approach goals. Researchers such as Dweck (1989); Nicholls (1984), and Ames (1992) originally envisioned performance goal orientations as the opposite of mastery goals, representing the maladaptive end of the motivational continuum. Investigators have later verified that mastery goals are, by and large, a positive predictor of adaptive learning processes. However, to the disappointment of many researchers, mastery goals often failed to produce tangible learning outcomes. Performance goals, meanwhile, have been shown to be a nonnegative and even a positive predictor of test scores and course grades, especially among college populations. This prompted a separation between approach and avoid components of performance goals (Elliot & Harackiewicz, 1996).

By and large, performance-approach goals demonstrate positive to nonsignificant relations with mastery goals and self-efficacy, whereas performance-avoid goals demonstrate nonsignificant to negative relations with the same variables (Elliot & Church, 1997; Middleton & Midgley, 1997; Skaalvik, 1997). Bong (2001) found that performance-approach and performance-avoid goals of a different group of Korean high school students were strongly correlated to each other across four core subject domains. Yet the two goals demonstrated distinct patterns of relations with other motivational constructs. Performance-approach goals were positively correlated with self-efficacy, task value, and mastery achievement goals, whereas performance-avoid goals exhibited mostly nonsignificant relations with the adaptive motivational beliefs. These findings were replicated in the present study. Regarding the approach form of performance goals, McGregor and Elliot (2002) thus stated, "it is time that educators begin to discuss . . . the issue of whether such goals should be encouraged in some instances . . . or at least not actively discouraged" (p. 393).

Despite much empirical evidence supporting the seeming harmless nature of performance-approach goals, several researchers still contest the notion of performance-approach goals as an adaptive motivator (e.g., Kaplan & Middleton, 2002; Midgley, Kaplan, & Middleton, 2001). Brophy (2004) discussed several reasons underlying this skepticism. Included among them was the greater likelihood that students who presently pursue performance-approach goals would switch to performance-avoid goals as the learning becomes more challenging and achievement turns unsatisfactory. In fact, the Korean high school girls who participated in this research reported extreme dissatisfaction with their academic achievement at the end of the first semester. More than 80% of the girls indicated that they were not satisfied with their grades in the three specific subject matter areas, and 91.3% also expressed dissatisfaction with their overall achievement (Bong, 2003). The present results thus offer some insight into the way the immediate benefit of adopting performance-approach goals could cost students their positive motivation in the long run. Obviously, correlation does not necessarily imply causation, even with the longitudinal data. Nonetheless, if future research shows that strong performance-approach goals are indeed one of the precursors of performance-avoid goals, actively discouraging such goals right from the outset may be one way to foster unyielding motivation.

Limitations and Directions for Future Research

The present research demonstrated the advantages associated with multiple assessments of students' perceptions toward their learning environment within the school year. Students adjusted their views of the environment over the course of normal classroom episodes. These changed contextual perceptions in turn explained the changes in students' motivation. Despite several findings that were deemed gender-specific, the ways students' perceptions of the environment related to their self-efficacy, personal achievement goal orientations, and exam performance were highly similar across a number of specific subject matter domains and general school learning. In particular, perceptions of mastery goal structures in the learning environment surfaced as consistent and continuing predictors of positive academic motivation. In sum, the present research contribute to the existing literature by dem-

onstrating that continued efforts to create motivationally adaptive learning environments could still bear fruit, despite the relative rigidity in motivational beliefs of these older students and the negative overall trend in their perceptions of the environment.

Several limitations should be noted. First, the present data spanned only a single school year. Longitudinal investigations spanning multiple school years are needed to more clearly demonstrate the impact of changed perceptions of the environment on students' ongoing motivation. Including younger students, such as those in elementary or middle school, will be helpful to delineate the changing point, if any, in the pattern of relations between perceptions of the learning environment, personal motivation, and academic performance. Second, only students' self-efficacy beliefs were measured before and after major achievement testing in this study. It is possible that achievement goals might also display a similar degree of context specificity to self-efficacy, given that short verbal instructions or success manipulations on relatively simple tasks were able to induce intended achievement goals among the participants in many experiments. Repeated measurement of students' achievement goal orientations across important intervening classroom events will allow testing the tenability of this supposition. It will also allow more systematic tests of the hypothesized mediating role of self-efficacy beliefs between academic performance and resultant achievement goal orientations. Finally, some of the present findings were attributed to gender and cultural differences. However, with no comparison group, the design of this study did not permit sound speculations on the gender- and culture-specific characteristics of the present sample or the nature of their influences in the findings. The issues of gender and culture need to be explored further in future studies.

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