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Effects of a  
self-regulated  
learning course  
on the academic  
performance  
and graduation  
rate of college  
students in  
an academic  
support program*

*The purpose of this study was to determine the effects of completion of a self-regulated learning course on long-term academic outcomes of undergraduate students from a university program to support underprepared undergraduate students. These students were compared to a group of students from the same program who were carefully selected to be similar in terms of number of prior academic credits, prior cumulative GPA, gender, and number of transfer credits. Students who took the course had significantly higher cumulative GPAs four semesters afterwards, significantly higher odds of graduation, and significantly lower odds of receiving one or more F grades in subsequent semesters. Course structure and other factors deemed central to the success of this course were identified.*

Systematic attempts to help college students complete academic tasks more effectively have existed for decades; Walter Pauk's (1962) landmark book, *How to Study in College*, was in its eighth edition in 2006. By the 1980s research in cognitive psychology had shaped a clear theoretical basis for teaching cognitive and affective learning strategies at the college level (Weinstein & Mayer, 1986). Such assistance has been provided in a variety of formats, including learning-to-learn courses, Supplemental Instruction for a single targeted course, and programs for underprepared students (Simpson, Hynd, Nist, & Burrell, 1997).

McKeachie and his colleagues (McKeachie, Pintrich, & Lin, 1985) were among the first to create an entire undergraduate psychology course devoted to teaching learning strategies. The development of their course was also noteworthy for assessing students' self-reported changes in learning strategies and for expanding conceptions of self-regulated learning by including metacognitive and motivational components. There are now undergraduate learning-to-learn or self-regulated learning (SRL) courses, as they will be called here, at many major universities and colleges. Pintrich (1995, 2004) has done an excellent job of articulating the manner in which cognitive, motivational, behavioral, and contextual features of SRL can be integrated and why such courses can be important for many college students. Pintrich's model views learners as active participants in the monitoring, control, and regulation of their behavior, affect, and cognition. These self-regulatory behaviors act as mediators between both personal and contextual characteristics and actual achievement or performance. Students can learn to regulate their resources, beliefs, and strategies in the service of any particular academic goal. Though there is a great deal of variability among these courses, Pintrich's unified view of the self-regulated learner is widely shared (e.g., Dembo & Seli, 2004; DuBois & Staley, 1997; Hofer, Yu, & Pintrich, 1998; Weinstein, 1994).

As greater agreement developed concerning the function and design of SRL courses, more attention was paid to assessing the degree to which students reported using various SRL behaviors. The two most popular self-report measures were developed specifically to assess strategic thoughts and behaviors that affect cognition and motivation and that are amenable to change. The Learning and Study Strategies Inventory ([LASSI], Weinstein, Palmer, & Schulte, 1987) was developed as a measure for students and their instructors to diagnose learning strengths

and weaknesses. The Motivated Strategies for Learning Questionnaire ([MSLQ], Pintrich, Smith, Garcia, & McKeachie, 1991) is similar except that it uses a single concurrent course as its referent and addresses motivational components more extensively.

Long-term effects of SRL courses can be understood in the wider context of how frequently various groups of college students report using learning strategies and the relationship of such use to various indices of academic performance. Studies have indicated widespread spontaneous use of certain types of learning strategies across different courses (Vermetten, Lodewijks, & Vermunt, 1999) and interactions among use of learning strategies, motivational beliefs, and domain-specific knowledge (VanderStoep, Pintrich, & Fagerlin, 1996).

VanderStoep et al. (1996) found that interaction among these three components discriminated high from low achievers in social and natural sciences courses, though not in humanities courses. Students with low grade point averages (GPAs) and students with learning disabilities scored significantly lower on the LASSI than their respective comparison groups (Proctor, Prevatt, Adams, Hurst, & Petscher, 2006). Similarly, high achieving Hong Kong students scored significantly higher on a Chinese version of the LASSI than did low achieving students (Yip, 2007).

In a meta-analysis of factors predicting college outcomes, a construct called "academic-related skills" was a strong predictor of college retention and a somewhat weaker predictor of cumulative GPA (Robbins, Lauver, Le, Davis, Langley, & Carlstrom, 2004). In a career planning and development course, Kern, Fagley, and Miller (1998) found a significant correlation between students' self-reported strategy use on 4 of the 10 LASSI scales and their current GPAs. However, when they predicted attrition rates from the American College Test (ACT) score, prior GPA, and a composite measure of SRL use, prior GPA was the only significant predictor of attrition. Garavalia and Gredler (2002) found that one of the factors on their self-reported SRL instrument was a modest but significant predictor of a psychology course grade, though not nearly as powerful a predictor as prior GPA.

A similar positive relationship between spontaneous strategy use and GPA has been found in students from underprepared populations. Williams and Hellman (1998) found modest but significant correlations between various self-reported SRL behaviors and GPA among first-generation community college students. Such populations of students, however, may show a lower level of spontaneous strategy use. Ley and Young (1998) found a group of community college and university developmental students to be significantly below other students on a composite measure of self-reported strategy use. In another study,

though the conceptions of learning expressed by indigenous Australian university students were not very different from those of other students, the learning and studying strategies they actually used did not mirror their beliefs about learning, but instead consisted mostly of repetition (Boulton-Lewis, Marton, Lewis, & Wilss, 2004).

Of more direct relevance to the present study is the more extensive literature on the effects of systematic attempts to teach learning strategies both on self-reported strategy use and on academic performance. Interventions clearly have been able to effect short-term change in students' self-reported strategy use. Significant improvements within an SRL course have been reported on both the LASSI (Weinstein, 1994) and the MSLQ (Hofer & Yu, 2003). Similarly, in one study with underprepared college students using a single textbook reading strategy, Donley and Spires (1999) found significant changes on 8 of the 10 LASSI scales.

Instructional interventions have also positively affected academic outcomes. In a meta-analysis of more than 50 study skills interventions, Hattie, Biggs, and Purdie (1996) concluded that, while the effects of such interventions on academic achievement are not as strong for college students as they are for younger students, they are significant nonetheless. The largest effect sizes tended to be associated with unistructural interventions measured over a short time span and with performance criteria closely related to the target strategies. The authors also noted that, across all the studies analyzed, the best results occurred when strategy training was used metacognitively, with motivational and contextual support, conditions created in the typical SRL course.

Interventions have also been successful with historically underrepresented students or underprepared students. A meta-analysis by Kulik, Kulik, and Shwalb (1983) indicated a small positive effect of special college programs for such students on GPA and retention. But these program interventions varied widely and typically did not consist of a single course. Martin and Arendale (1992) compiled research on the effects of Supplemental Instruction interventions across different types of schools, different ability levels, and various ethnicities. They reported that, overall, Supplemental Instruction significantly lowered the percentage of Ds and Fs in the targeted classes, raised course grades, and was generally associated with higher re-enrollment and graduation rates. However, we found no single carefully designed Supplemental Instruction study demonstrating these effects and such programs do not primarily target SRL principles or strategies.

Few studies, however, have examined the effect of a single SRL course on subsequent GPA, retention, or graduation. Tarpey and Harris (1979) found that students who had taken a study skills course had significantly

higher GPAs at the end of the semester than those who were wait-listed for the course. Lipsky and Ender (1990) examined the effects of a one-credit study skills course on GPA and retention in two separate cohorts of probationary students who had enrolled in the course either 1 year or 2 years previously. The mean cumulative GPA of the students enrolled in the class was higher than that of probationary students who chose not to enroll in the course, significantly so for the cohort of students who had taken the course 2 years previously. The retention rate in each cohort was greater than that in the comparison group of probationary students, significantly so for those students who had enrolled in the course 1 year earlier. O'Neil (1994) found that a sample of students from underrepresented ethnic groups, many of whom were also first-generation college students, had significantly higher GPAs 4 semesters after enrolling in an SRL course. O'Neil's study, however, did not include a comparison group. Weinstein and her colleagues studied the long-term academic effects of freshmen enrolled in a SRL course (Weinstein, Dierking, Husman, Roska, & Powdrill, 1998). When compared to all other freshmen at the school, students who had taken the SRL course had a somewhat higher retention rate and a higher mean cumulative GPA after one year. Whereas 71% of these students had graduated within 5 years of enrollment, only 55% of the other freshmen had. The mean cumulative GPA of students taking the course was higher than that of the other freshmen after 1 year; after 5 years, whereas the mean cumulative GPA of students who had taken the course dropped only slightly, the decrease was somewhat greater for the other freshmen. However, there were a wide variety of students in the SRL class and Weinstein et al. did not attempt to analyze effects separately for any particular group of underprepared students. Further, there was no way to assess the viability of using all other freshmen as an appropriate comparison group, and no statistical significance tests were reported.

Thus there is a need to examine more carefully the long-term effects of SRL courses on subsequent academic performance (Hofer & Yu, 2003; Simpson et al., 1997), especially with groups of students most likely to profit from these courses. More specifically, research is needed to compare the long-term academic performance of a specific group of underprepared students with that of a viable comparison group.

The three most unique elements of the present study were the efforts made to create a more viable comparison group, the inclusion of graduation data, and the time lag between initial class enrollment and final collection of graduation data. The participants were those undergraduate students who had taken an SRL course and who also were members of an academic support program for underprepared students. To enroll in

this program, a student must have a demonstrated academic need and either be a first-generation college student or eligible for need-based financial aid. The support program offers several services and activities designed to address student needs. These include academic and financial aid counseling, preparation for professional programs and other career planning, facilitation of academic enrichment activities, such as the National Student Exchange program, and entry to the SRL course and other selected classes geared to underprepared students. The percentage of students from ethnicities underrepresented on their campus in this support program is approximately double that of the general campus population and the majority are first-generation college students. Over several semesters a counselor from that academic support program attempted to match each of the program students who were taking the SRL course with another student enrolled in the support program at the same time, but not enrolled in the SRL course. The comparison student was selected primarily on the basis of a similar prior cumulative GPA and secondarily on the basis of similar numbers of prior academic credit hours and transfer credits at the time of enrollment or non-enrollment in the course. Because there has been some indication that female developmental students report significantly higher SRL use (Ray, Garavalia, & Gredler, 2003), gender was also used in selection of the comparison group students. Academic records were checked for all students up to 7 years after enrollment or nonenrollment in the course. This time lag allowed a more definitive determination of graduation.

The two primary measures of long-term academic performance were cumulative GPA four semesters subsequent to enrollment or non-enrollment in the SRL course and graduation. When the graduation data were collected, additional measures of long-term performance were also obtained: whether the student had been put on probation, suspended or dismissed in any subsequent semester; whether the student had received any F grades in subsequent semesters; and whether the student had received a GPA lower than 2.0 in any subsequent semester. The time lag in data collection also allowed an examination of whether students taking an SRL course might be more likely to be accepted into a graduate degree program and, indeed, obtain a graduate degree. These last two measures were seen as approximate, since only acceptance into or graduation from a University of Hawai'i graduate program showed on the transcript and since even 7 years may be insufficient time to gather complete postgraduate data.

This study, then, attempted to address whether underprepared students who take an SRL course are significantly different from a carefully created comparison group of students in cumulative GPA four semesters

after the course, graduation rates, and five secondary measures of long-term academic success.

This SRL course is similar to many such courses (e.g., Dembo et al., 2004; Du Bois & Staley, 1997; Hofer et al., 2003; Weinstein, 1994) and somewhat unique in a few key attributes. As in most SRL courses, the present course assumes that SRL is controllable and that undergraduate students can learn to self-regulate, primarily through greater metacognitive awareness and through the implementation of cognitive and affective strategies in the academic situations they encounter. Heavy emphasis is laid on their becoming more aware of their thoughts and behaviors while encountering typical academic tasks, clarifying academic goals, monitoring their application of the strategies, evaluating their success with the strategies used, and modifying their approach as necessary. Self-report measures of SRL are administered at the beginning and end of the course, and students are encouraged to reflect on how they can best use the results to modify their control of various academic situations. Key concepts are introduced in the context of principles of cognitive psychology or motivational theories. Students practice the strategies and receive feedback on their attempts. Content areas within the course largely reflect those recurring academic tasks deemed critical for academic success: short-term goal setting, time management, note taking, text comprehension, planning and writing course papers, exam preparation, test taking, stress management, resource identification and utilization, and self-management. As with many such SRL courses, first-generation college students and students from ethnicities underrepresented on the campus are actively recruited.

The course is probably least like the typical SRL course in its class size, its emphasis on computer-mediated and face-to-face interaction, the degree to which application in other courses is required, and the class composition. As a course designated "writing intensive," no more than 20 people may enroll in any section of the course. In addition to frequent small-group discussions, students are also required to interact with peers on computer conferences set up for the class. In each conference, students describe and evaluate their attempts to implement a particular strategy in another course and exchange feedback with their peers on their attempts. Such interactions are an important way to foster cognitive development among college students (Whitt, Edison, Pascarella, Nora, & Terenzini, 1999) and also serve to increase motivation. Although some SRL courses do not actually *require* attempted application of strategies to courses being taken concurrently, Simpson and Nist (2000) have argued that instruction in such courses needs to emphasize the strategy transfer and modification such attempts would

elicit. Adapting strategies for use in concurrently taken courses is a major feature of this course. Students develop three specific strategies to attempt in one or more of their other courses over the semester, and this becomes the topic of the major paper in the course. The composition of students in this class is somewhat atypical insofar as the course is not required of any program, students must obtain an instructor's approval to register for the course, and students are discouraged from taking the course during the first semester of their freshman year. Though not unusual at our university, it is probably unique that no ethnic group comprises a majority of the students in the class.

## **Method**

### *Participants*

All 157 undergraduate students in this study were enrolled in the previously described academic support program at the University of Hawai'i at Mānoa. Of this total 79 were students who enrolled in one of the two sections of an SRL course (SRL course group). The majority of students in the SRL course group were sophomores. Seventy-eight other students from the academic support program were selected to be as comparable as possible to their peers enrolled in the SRL course. There were 24 men and 55 women in the SRL course group and 26 men and 52 women in the comparison group; the average ages of students in the two groups were 21.2 years and 21.0 years, respectively.

Information on ethnicity was available only for the SRL course group. Of the 78 students providing ethnicity information in this group, only 37 (47%) self-identified a single ethnicity; of these, 14 were Filipino, 9 were Japanese, 8 were Chinese, and 6 were other ethnicities. Of the 41 students identifying more than one ethnicity, 16 identified two ethnicities, 14 identified three ethnicities, and 9 identified four or more ethnicities. At the University of Hawai'i at Mānoa, the two ethnic groups most underrepresented are Filipino and Hawaiian or part-Hawaiian. Of these 78 students, 33 identified themselves as part-Hawaiian, part-Filipino, or both. Including the 14 Filipino students, then, 47 students in the SRL course group (60%) were members of one of the two largest underrepresented ethnic groups on campus. Of the 73 students in the SRL course group for which data was available, 63 (86%) were first-generation college students. The other unusual characteristic of this sample was that only 3 of the 78 identified themselves as Caucasian.

### *Measures*

For each student in the SRL course group who agreed to participate and each student in the comparison group, the following data were collected:



cumulative GPA before the semester of SRL course enrollment or non-enrollment; number of prior academic credit hours; number of transfer credits; number of prior credit hours; gender; number of semesters subsequent to enrollment or nonenrollment in which the student received one or more F grades; number of subsequent semesters in which the student achieved a GPA lower than 2.0; whether the student was put on probation, suspended or dismissed in any subsequent semester; cumulative GPA at the end of the fourth semester following course enrollment or nonenrollment; whether the student graduated within 7 years of enrollment or nonenrollment in the SRL course; whether the student had subsequently been accepted into a graduate degree program within the university system; and whether the student attained a graduate degree within the University of Hawai'i system.

### *Procedure*

In order to create the most viable comparison group, students were chosen from the same academic support program if a close match could be made to a target student on the basis of current cumulative GPA at the time of enrollment or nonenrollment in the SRL course, number of prior academic credit hours, number of transfer credits, and gender. Because of the small size of each self-regulated learning class, students were selected and aggregated across several consecutive semesters from sections taught by two different instructors in order to create a sufficiently large group. The sections of the different instructors followed a common course syllabus and met jointly on occasion.

## **Results**

### *Preliminary Analyses*

There was support for the viability of the comparison group. The cumulative prior GPA of the SRL course group ( $M = 2.64$ ,  $SD = 0.49$ ) was not significantly different from that of the comparison group ( $M = 2.63$ ,  $SD = 0.49$ ),  $t(155) = -0.17$ ,  $p = .86$ . Number of prior credit hours for those in the SRL course group ( $M = 53.03$ ,  $SD = 30.80$ ) was not significantly different from the number of hours for those in the comparison group ( $M = 51.37$ ,  $SD = 27.44$ ),  $t(155) = -0.36$ ,  $p = .72$ . Differences in the frequencies of males and females in the SRL course group (24 and 55, respectively) and in the comparison group (26 and 52, respectively) were not statistically significant  $\chi^2(1, N = 157) = .16$ ,  $p = .69$ . And number of transfer credit hours for those in the SRL course group ( $M = 10.77$ ,  $SD = 22.16$ ) was not significantly different from number of transfer credit hours for those in the comparison group ( $M = 8.13$ ,  $SD = 15.43$ ),  $t(155) = -0.87$ ,  $p = .39$ . There were no significant differences between the students of the two instructors in the means on any of these measures

There were no statistically significant 3-way interactions among gender, prior cumulative GPA, and SRL course enrollment for any of the analyses in this study. Statistically significant 2-way interactions are reported separately for each analysis.

### *Long-term Change in Cumulative GPA*

The first major question of this study was whether participation in the SRL course would lead to significant long-term change in GPA, relative to the comparison group. Using the SAS statistical package, an analysis of covariance (ANCOVA) was done on cumulative GPA four semesters after enrollment or nonenrollment, with prior cumulative GPA and gender as covariates. The assumption of homogeneity of regression was met for both gender and prior cumulative GPA. There was a significant interaction between these covariates, determined to be independent of group, and this interaction was also included as a covariate in the analysis. Table 1 shows the results of this ANCOVA. The SRL course group ( $M = 2.81$ ,  $SD = 0.44$ ) had a significantly higher cumulative GPA four semesters after enrollment than the comparison group ( $M = 2.59$ ,  $SD = 0.50$ ). The entire model accounted for 69% of the variance in cumulative GPA four semesters later. Not surprisingly, prior cumulative GPA accounted for 62% of the variance by itself and course enrollment accounted for an additional 4%. The significant interaction effect between gender and prior cumulative GPA was such that, independent of SRL course enrollment, females with lower prior GPAs tended to show larger increases in subsequent cumulative GPA than males with lower prior GPAs.

*Table 1 Analysis of Covariance of Subsequent Cumulative GPA as a Function of SRL Course Enrollment, With Gender, Prior Cumulative GPA, and Gender \*Prior Cumulative GPA as Covariates*

Source	df	SS	MS	F
Gender	1	0.41	0.41	5.53*
Prior Cumulative GPA	1	22.53	22.53	307.10***
Gender X Prior Cumulative GPA	1	0.65	0.65	8.82**
SRL Course Enrollment	1	1.46	1.46	19.88***
Error	152	11.15	0.07	
Total	156	36.20		

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### *Graduation*

The second major question concerned whether enrollment in the SRL course would significantly impact eventual graduation rates. At least 7 years after enrollment or non-enrollment in the SRL course, graduation data were obtained for 78 of the 79 students in the SRL course group and all 78 of the students in the comparison group. Whereas 58 (74%) of the 78 comparison group students had graduated, 74 (95%) of the 78 SRL course students had. A logistic regression analysis was done on the probability of graduation, using course enrollment, gender, prior cumulative GPA, and the interaction between gender and prior cumulative GPA as predictors. Only SRL course enrollment  $\chi^2(1, N = 156) = 14.98, p < .001$  and prior cumulative GPA  $\chi^2(1, N = 156) = 4.26, p = .04$  were found to be statistically significant predictors of graduation. The odds ratio estimate for the SRL course enrollment effect was found to be 12.69, with 95% confidence limits of 3.51 and 45.98. In this case the odds refer to the probability of a person graduating, relative to the probability of his or her not graduating, so the *odds ratio* is the ratio of the odds of a person who enrolled in the SRL course graduating to the odds of a person in the comparison group graduating. Thus, the odds of students enrolled in the SRL course graduating were about 13 times the odds of comparable students from the same academic support program graduating. A subsequent analysis revealed extremely high predictive accuracy for this logistic regression model; specifically, 88% of the students in both groups would have been correctly classified.

### *Other Indicators of Academic Performance*

In addition to the main measures described above, the following data were also collected for each student: whether he or she had any subsequent semester in which a negative academic action (academic probation, suspension, or dismissal) had been taken against him or her; whether he or she had one or more F grades in any subsequent semester; whether he or she had any subsequent semester in which his or her GPA fell below 2.0; whether he or she had been accepted into a graduate degree program; and, if so, whether he or she had obtained a graduate degree. Table 2 shows the number of students in the SRL course group and in the comparison group for each of the indicators, as well as the number graduating in each group.

For each potential indicator of academic performance, a logistic regression analysis was done on the probability of that indicator, using course enrollment, gender, prior cumulative GPA, and the interaction between gender and prior cumulative GPA as predictors.

*Table 2 Long-Term Academic Outcomes for Students Enrolled or Not Enrolled in SRL Course*

Outcome	SRL Course Enrollment ( <i>n</i> = 79) <sup>a</sup>		No SRL Course Enrollment ( <i>n</i> = 78)	
	no (%)	yes (%)	no (%)	yes (%)
Negative academic outcome	74 (94%)	5 (6%)	66 (85%)	12 (15%)
Semester with "F" grade	57 (72%)	22 (28%)	37 (47%)	41 (53%)
Semester with GPA < 2.0	56 (71%)	23 (29%)	46 (59%)	32 (41%)
Graduation	4 (5%)	74 (95%)	20 (26%)	58 (74%)
Graduate program acceptance	63 (80%)	16 (20%)	70 (90%)	8 (10%)
Graduate degree	69 (87%)	10 (13%)	72 (92%)	6 (8%)

<sup>a</sup>*n* = 78 for graduation.

Prior cumulative GPA was the only significant predictor of a negative academic action in subsequent semesters  $\chi^2(1, N = 157) = 5.46, p < .05$ , although the difference between the SRL course group and the comparison group was in the predicted direction and approached statistical significance  $\chi^2(1, N = 157) = 3.26, p = .07$ .

SRL course enrollment  $\chi^2(1, N = 157) = 10.05, p < .001$ , prior cumulative GPA  $\chi^2(1, N = 157) = 13.09, p < .001$ , gender  $\chi^2(1, N = 157) = 6.22, p < .05$ , and the interaction of gender with prior cumulative GPA  $\chi^2(1, N = 157) = 5.92, p < .05$  were all significant predictors of whether a student had any subsequent semesters with at least one F grade. The odds ratio estimate for the SRL course enrollment effect was 0.30, with 95% confidence limits of 0.14 and 0.69. Thus, the odds of students enrolled in the SRL course receiving an F grade in any semester subsequent to course enrollment were only 30% of the odds of comparable students from the same academic support program receiving an F. The significant

interaction effect between gender and prior cumulative GPA was such that, independent of SRL course enrollment, the odds of females with prior GPAs under 2.0 receiving an F grade in any subsequent semester were much lower than for males with similar prior GPAs. A subsequent analysis revealed fairly high predictive accuracy for this logistic regression model; specifically, 71 % of the students in both groups would have been correctly classified.

Prior cumulative GPA  $\chi^2(1, N = 157) = 12.07, p < .001$ , gender  $\chi^2(1, N = 157) = 6.55, p < .05$ , and their interaction  $\chi^2(1, N = 157) = 6.41, p < .05$  all were significant predictors of whether the students would have any subsequent semester with a GPA lower than 2.0. The difference between the SRL course and comparison groups, though in the predicted direction, failed to reach statistical significance  $\chi^2(1, N = 157) = 2.03, p = .15$ . As with the previous analysis, the significant interaction of gender and prior cumulative GPA meant that, independent of SRL course enrollment, the odds of females with low prior cumulative GPAs having a subsequent semester with a GPA less than 2.0 were lower than those for their male counterparts.

There were no significant predictors of whether the students had been accepted into a graduate program, though the difference in the course enrollment groups was in the predicted direction and close to statistical significance  $\chi^2(1, N = 157) = 2.73, p = .10$ .

Finally, there were no significant predictors of whether the students attained graduate degrees.

## **Discussion**

Taken as a whole, this study provides evidence that a single SRL course can have a significant impact on the long-term academic performance of underprepared college students, including whether or not they graduate from college. Relative to comparable students who had not enrolled in the SRL course, students who had taken the SRL course showed significant gains in their cumulative GPAs four semesters after enrollment and showed a significantly higher rate of graduation. SRL course enrollment was an even more powerful predictor of graduation than prior cumulative GPA. Previous studies have shown that such courses can have a significant positive impact on students' self-report of SRL, and a few have shown that they can positively impact GPA several semesters later. However, no published study that we are aware of has shown significant long-term gains in GPA relative to a carefully selected comparison group of students. And none has shown that a single SRL course can have a significant and positive effect on the graduation rate of a specific group of underprepared students.

Other measures of long-term academic performance showed similar effects. Students taking the SRL course were less likely to be put on academic probation, suspended, or dismissed than the comparison students, and students in the SRL course were less likely to have received an F grade or obtained a semester GPA lower than 2.0 in any subsequent semester. Even two rough measures of subsequent graduate degree work show differences favoring the students who had taken the SRL course. Though the measures of acceptance into a graduate program and obtaining a graduate degree were limited to programs within the university system and to a 7-year period, it is interesting to note that at least 20% of the students taking the SRL class had already been accepted into a graduate program.

Independent of SRL course enrollment, there was some indication that females with lower GPAs may have a better long-term academic prognosis than males with lower GPAs. This interaction was significant for cumulative GPA four semesters after the course. Likewise, relative to males, females with lower cumulative GPAs were less likely to have a subsequent semester in which they received an F or a subsequent semester in which they received a GPA lower than 2.0. Though in this study enrolling in the SRL course bestowed no significant advantage to either gender entering with lower GPAs, other studies have suggested that females may report higher levels of SRL usage. The question of how an SRL course may differentially affect males and females remains an interesting topic for further study.

Extensive efforts were made in the present study to create as viable a comparison group as possible. Students in the comparison group had voluntarily enrolled in the same academic support program, had the same opportunity to enroll in the course, and had very similar academic backgrounds in terms of prior cumulative GPA, prior credits, and number of transfer credits. Nevertheless, there may have been differences in academic motivation between those who took the course and the comparison group. Although beyond the scope of the present study, it would be very interesting to administer a series of motivational measures to all the students in a specific academic support program and later determine whether there are differences in motivational profile between those students who subsequently choose to enroll in an SRL course and those who do not.

Though SRL course enrollment was a significant predictor of cumulative GPA four semesters later, it is not surprising that it was not nearly as powerful a predictor as cumulative GPA prior to the course. As powerful an effect as an SRL course may have, it is important not to see it as a single, simple solution to address the needs of underprepared

college students. Rather, it is best seen as a significant component in the context of an integrated system of continuing support for students who might otherwise not persevere. In this vein, it is interesting to note that the comparison group students had a 74% graduation rate. These were also underprepared students, but they had joined the academic support service and presumably had availed themselves of some of the opportunities such services provide. In an indirect way, then, this study also reinforces the importance of such programs.

With the aim of increasing dialogue among those who plan and teach SRL courses, this discussion ends with speculation about three issues that may have made the effects of this particular SRL course more powerful. These have to do with the class environment experienced by the students, ways in which to focus extensive practice and reflection, and the experience of an increased sense of agency.

It is arguably more threatening for low-achieving students to focus on their academic behaviors if they see themselves as outsiders in an academic environment. In that sense, this particular course may be more comfortable for them insofar as there are many students they perceive as similar to themselves. The perceived similarity may be in terms of ethnicity, being a first-generation college student, or simply being unsure of their academic abilities. As instructors of the SRL course, we are fortunate to be able to partially determine the mix of students enrolled. The course is not required by any program, so enrollment is voluntary. And, although our focus is on enrolling students who are underprepared for college success, we also admit students at various stages of their college careers (e.g., before or after selecting a major). And we admit several students who are performing adequately in school, but who want to do so with more confidence or who want to excel. This mix of students is important so that the students don't feel stigmatized, as they might in a class where enrollment depends upon poor prior academic performance. We are also fortunate that, at our institution, there are many different ethnicities on campus; none is in the majority, and many students have mixed ethnic backgrounds.

Smaller class size also can help create a more psychologically safe classroom environment. Students more easily establish relationships with peers and with instructors, seem to be less inhibited about initiating new behaviors, and often are motivated by their peers' successes. Though this may not be possible in other settings, on our campus we can limit class size to 20 by having the course designated as "writing intensive." Though this means that we have to emphasize writing assignments, we use this to our advantage by focusing the student's written reflections on attempts to apply various learning strategies to other courses and by

having the major paper reflect a semester-long attempt to initiate and maintain more effective strategies in three areas of the student's choosing. Even in a larger class, however, students can be placed in small, stable interactive groups with much the same effect.

Creating a positive and comfortable classroom environment makes the structured and focused practice built into the course even more effective. Though the various strategies are demonstrated within the course, students practice those strategies almost exclusively in their other concurrent courses. Strategies demonstrated in the course are explained in the context of easily understood cognitive and motivational processes. Following discussion of how a suggested strategy might be used or adapted to various different courses, students modify the set of integrated specific behaviors that will constitute the strategy for them in one or more of their other courses. Then they monitor their application of the strategy two or more times in a particular class context, evaluate and modify it, then reflect on their experience in a computer-mediated conference dedicated to that strategy. Students are also required to respond to the reflections of the other three members of their own peer response groups and encouraged to read and respond to others as well. Both while planning their use of the strategy and after they reflect on their attempts to apply it, they get constructive feedback from their small group and from the instructor rotating among the groups. Beyond this initial experience with several strategies, near the beginning of the course, each student identifies two strategies (e.g., comprehension of history texts, managing stress while taking science tests, taking and reviewing notes for psychology classes using a split-sheet system) that he or she will work with the entire semester and that will be the focus of the main course paper. A third strategy, short-term goal setting, is common to all students in the class and is carried out and discussed regularly in class. Because monitoring their careful application of strategies has proven so difficult for them to do consistently, students are given large index cards with the specific behaviors of each of their three strategies printed out in order to make their monitoring more consistent. Thus, compared to many SRL courses, there is even more extensive practice on a small number of strategies each student deems most useful. This has been quite helpful in the difficult task of establishing and maintaining effective new habits, especially when one's first few attempts are often awkward and less efficient.

The final issue is as important as it is elusive—increasing a student's sense of agency in his or her college career and beyond. Whether from habits established over long years of schooling or lack of knowledge about how to approach tasks differently, many college students act as



if their success depends upon how well they react to the demands of instructors and courses and do not experience the huge effect their own proactive control of learning situations can have on their learning and on their motivation. Often a few small changes in how a student goes about a recurring academic task can lead to very concrete changes in task success. When most students experience this, they become much more motivated to try other changes and, optimally, to increase their expectations for academic success. We have seen our role in this to be the creation of settings in which such epiphanies are more likely to occur. There are at least two general strategies that we use in this course that are available to instructors: providing meaningful choices and engineering small, yet concrete, successes. By not making enrollment in the course required for any student and by having students obtain permission to enroll, we hope to have students begin to think about their academic success even before the course begins. More directly, choice in the selection and modification of strategies that will be their main focus throughout the semester and choices in where and how they will attempt other strategies has served to make students more focused and committed to positive change. In this sense many students experience the new cognitive and motivational principles, their peers, their instructor, and even their assignments in other classes as potential resources directly relevant to their success, whose use is at least partially under their control. For many these have been powerful and freeing realizations. In conjunction with that, in every large task we work with the students to break tasks down into small and concrete parts that they have a realistic chance of accomplishing within a very short time frame to make sure they understand *what* they need to do and *how* to do it. Creating meaningful choices and engineering concrete, short-term successes have been important guiding general principles in the development of our SRL course.

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