It is not uncommon to hear a student blame a teacher for a low grade in a course, but the implications of such comments are not always addressed. Incidentally, these occurrences provide insight into where the student believes the control of reinforcement over an outcome exists. Within the framework of social learning theory, Rotter (1966) introduced generalized expectancies for internal versus external control of reinforcement, which refers to the belief or expectation that control of reinforcement for future outcomes exists primarily within oneself or in external sources. For example, individuals with a prototypical internal locus of control perceive a direct link between their actions and the rewards and punishments they incur in day-to-day life. Individuals with a prototypical external locus of control believe that rewards and punishments vary with external sources, such as luck, fate, or powerful others. The construct of locus of control has enjoyed widespread attention in the scientific literature, which logs a compelling record of its usefulness.

An internal locus of control is often tied to greater academic performance (Carden, Bryant, & Moss, 2004). One explanation for this pattern of data is that students with an internal locus of control perceive a link between their behavior and control over the reinforcement, which makes them more likely to put forth the effort to do well. Logically, their external counterparts are less consistent in their academic efforts because the reward for the behavior is expected to come from external sources. For example, Trice and Hackburt (1989) examined the relationship between academic locus of control and college absenteeism. The researchers measured students’ locus of control, and then asked students to keep diaries for 6 weeks, in which they recorded absences and noted whether those absences were illness-related. There was a significant correlation between an external locus of control score and absences unrelated to illness. Furthermore, Gump (2004) established a strong negative relationship between absences and course grade. These data lay credence to the claim that an internal locus of control is characteristic of effortful students who are more likely to perform better academically. When students believe the reward will become from internal sources (as opposed to external ones), they are more likely to do what is necessary to perform well (e.g., attend class). Thus, an internal locus of control

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Underpinnings of Academic Success: Effective Study Skills Use as a Function of Academic Locus of Control and Self-Efficacy

Research indicates an internal locus of control (LOC) and high self-efficacy (SE) are related to greater academic performance. However, how LOC and SE relate to self-reported study skills use, a known precursor to academic performance, is not entirely clear. Participants’ scores on the LOC and SE scales were split down the median to produce a 2 x 2 matrix, wherein an internal LOC and high SE would hypothetically correspond to the greatest self-reported use of study skills. The results revealed that participants with a moderate LOC and moderate SE reported significantly less study skills use than the other 3 groups. The authors discuss how greater academic performance is implied through LOC, SE, and their attendant pattern of study skills use.

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is linked to academic effort, which in turn affects academic performance.

In another instance where effort (or lack thereof) can impede student success, Janssen and Carton (1999) studied how procrastination would be influenced by locus of control and task difficulty. In this study, procrastination was defined as “the act of needlessly delaying a behavior until the point of some discomfort” (Janssen & Carton, p. 436). Students completed an academic locus of control scale, and then received one of two homework assignments of varying difficulty. No significant effects of task difficulty on procrastination were observed, but students with an internal locus of control tended to begin the assignment earlier than their external counterparts, and took significantly fewer days to complete and return the assignment. Carden, Bryant, and Moss (2004) reported similar findings; when students were categorized into internal and external groups by splitting locus of control scores down the median, students with an internal locus of control emerged with less procrastination and greater academic performance (as measured by self-reported cumulative GPA).

Onwuegbuzie and Daley (1998) found a positive correlation between locus of control and the study habits of students. In this study, undergraduate participants completed an inventory of questionnaires to ascertain the characteristics of successful students. The profile of a successful student emerged as one that has an internal locus of control, more individualistic tendencies, and higher perceived scholastic competence, self-worth, and intellectual ability. Locus of control was the strongest predictor of study habits for the sample. Onwuegbuzie and Daley showed that an internal locus of control was predictive of what students do while studying for an upcoming examination (study habits).

The premise behind locus of control is that students with internal scores are more willing to put forth the effort to do well in academic pursuits, because they believe the outcome can be influenced by effort. If the student is to put forth the effort to do well, it is assumed that he or she must be confident the exertion will produce the intended result. This degree of confidence in the ability to complete a task is known as self-efficacy (Bandura, 1977, 1986). Self-efficacy is also an important variable underlying student effort, leading to academic success.

Self-efficacy has been linked to academic performance (Chemers, Hu, & Garcia, 2001). Chemers et al. measured the self-efficacy, adjustment, and stress of freshmen one quarter of the way into the academic year, and then had them complete the same measures toward the end of the academic year. High academic self-efficacy was positively related to academic performance and adjustment in college students. In a study of Australian nursing majors, Andrew (1998) found that self-efficacy in science predicted academic performance in both physical science and bioscience courses.

There is a positive relationship between self-efficacy, academic performance, and persistence, as demonstrated by a meta-analytic study by Multon, Brown, and Lent (1991). In two meta-analyses, the authors found a relatively strong relationship with self-efficacy for performance and persistence (effect size estimates of .38 and .34, respectively). Interestingly, age appeared to moderate the relationship between self-efficacy and performance. For students who fell within the normal achievement range, the relationship between self-efficacy and performance increased with age. Multon, Brown, and Lent (1991) offered the explanation that older students simply have more experience by which to gauge their academic strengths and weaknesses, which results in a stronger relationship between efficacy beliefs and performance. In any event, the effect sizes reported in these meta-analyses are a strong indicator that self-efficacy influences performance in academe.

Performance can be impeded in a number of ways, such as when students procrastinate prior to an upcoming exam. However, the impediment may not be deliberate procrastination; students may simply avoid help in the classroom when needed. In this situation, self-efficacy has surfaced as an important variable. Ryan, Gheen, and Midgley (1998) found that higher levels of help seeking were associated with high self-efficacy. It appears that students with high self-efficacy are more inclined to seek help when they need it, and may, therefore, do better in school.

Thus, locus of control and self-efficacy are independently predictive of a host of important academic criteria, but how these constructs independently and interdependently lead to academic success remains open to further inquiry. This study more directly investigated study skills (a known precursor to academic success) as a key factor, rather than just a correlate, between locus of control and self-efficacy. The authors hypothesized that students with an internal locus of control and high self-efficacy would report the greatest use of effective study skills.

Method

Participants

The participants were 127 undergraduate students (46 men and 81 women) from a small public master’s level university in the Midwest. The participants were recruited from introductory psychology classes and
received course credit for participation. Mean ages for men and women were 19.85 and 21.83 years, respectively. Participants were treated according to the ethical guidelines of the American Psychological Association (APA, 2002).

Materials
Participants completed an inventory of three questionnaires. Participants completed the 28-item dichotomous Academic Locus of Control Scale (Trice, 1985). This scale was validated for use with a college population and measures student beliefs of control over academic results. Trice reported acceptable test-retest reliability for a five week interval at .92. Participants also completed the 32-item Study Skills Self-Efficacy Scale (Silver, Smith, & Greene, 2001), which has students rate how accurately each statement describes their behavior along a 6-point Likert scale (1 = strongly agree, 6 = strongly disagree). This scale measures student self-efficacy, or confidence, in study strategies. Reliability data were not reported along with the published scale. In addition, to measure the extent to which participants used effective study strategies, a 20-item questionnaire was developed for this study from a list of effective study habits described by Ellis (1994, p. 100-104). This questionnaire addressed how often students used context, visualization, types of elaborative rehearsal, as well as favorable study conditions (i.e., reduced distractions and proper lighting when studying). For example, one item stated, “I use a mix of memory strategies in order to retain information (e.g., acronyms to remember lists of words, interactive imagery to remember places and events, etc.).” This questionnaire asked participants to answer along a 6-point Likert scale (1 = always, 6 = never) the extent to which they used each particular study technique.

Procedure
The investigators informed participants that the purpose of the study was to survey attitudes of college students about their academic behavior. The three questionnaires were administered in counterbalanced order so that the possibility of order effects was minimized. Participants were allowed 30 min to complete the questionnaires, although no participants approached this time limit. The actual purpose of the study, including an explanation of the concepts measured by the surveys, was revealed after the questionnaires had been collected.

Results
Researchers split participants’ scores on the LOC and SE scales down the median to assign participants to groups. Few participants’ scores reflected an external locus of control or low self-efficacy. Therefore, participants were selected and categorized according to an internal (M = 8.01, SD = 2.45) or moderate (M = 14.88, SD = 2.13) locus of control score and a high (M = 66.69, SD = 11.37) or moderate (M = 99.60, SD = 13.00) self-efficacy score to yield four groups of participants. The scores from participants on the study skills scale (the dependent variable) had a possible range of 20–120. Scores were transformed so that higher scores denote greater self-reported use of study skills. The mean scores and standard deviations on the study skills scale for each group are presented in Table 1.

A 2 (LOC) x 2 (SE) between-group analysis of variance (ANOVA) along with partial eta-squared effect size estimates revealed that both locus of control, F(1, 123) = 12.15, p < .01, η² = .09; and self-efficacy, F(1, 123) = 23.17, p < .01, η² = .16, had main effects for study skills. Participants who were categorized as having an internal locus of control reported significantly greater use of study skills than participants with moderate locus of control. In addition, participants who were categorized as having high self-efficacy reported significantly greater use of study skills than participants with moderate self-efficacy. No significant interaction between locus of control and self-efficacy was observed, F(1, 123) = .01, p > .93.

Although the interaction between locus of control and self-efficacy was not significant, the authors elected to further investigate the combined effects with Bonferroni post-hoc tests, p < .05. The tests revealed that participants who were categorized as having both an internal locus of control and high self-efficacy reported significantly greater use of study skills (M = 95.19, SD = 6.87) than participants in the moderate locus of control and moderate self-efficacy

| TABLE 1 | Study Skills Scores as a Function of Locus of Control (LOC) and Self-Efficacy (SE) |
|---------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
|         | Locus of control               | Moderate                       |                             |                             |
|         | Internal                       | High SE | Mod SE | High SE | Mod SE |
| N       | 31.00                         | 26.00   | 31.00 | 39.00 |
| M       | 95.19*                        | 91.69*  | 92.74* | 86.41b |
| SD      | 6.87                          | 6.48    | 6.41  | 6.46  |

Note. Means that do not share subscripts differ at p < .05.
LOCUS OF CONTROL, SELF-EFFICACY, AND STUDY SKILLS □ Landis, Altman, and Cavin

group \((M = 86.41, SD = 6.46)\). However, the group with an internal locus of control and high self-efficacy did not report significantly different study skills use than the groups with an internal locus of control and moderate self-efficacy \((M = 91.69, SD = 6.48)\), or a moderate locus of control and high self-efficacy \((M = 92.74, SD = 6.41)\). Note that the participants who were categorized as having a moderate locus of control and moderate self-efficacy reported significantly less study skills than their counterparts in each of the other three groups.

**Discussion**

Independently, locus of control and self-efficacy had their predicted effects on study skills. Students with an internal locus of control reported greater use of study skills than students with a moderate locus of control. Similarly, high self-efficacious students reported greater use of study skills than their counterparts with moderate self-efficacy. These effects were observed despite the range restriction; few students scored toward the external end of the locus of control scale and the low end of the self-efficacy scale.

The hypothesis, that an internal locus of control with high self-efficacy would correspond to the greatest self-reported use of study skills, was partially supported. When locus of control and self-efficacy were combined, students with an internal locus of control and high self-efficacy had the highest mean study skills scores of all groups; scores were not significantly higher than for students with either an internal locus of control and moderate self-efficacy, or a moderate locus of control and high self-efficacy. However, having either an internal locus of control or high self-efficacy \((or both)\) resulted in students reporting significantly greater self-reported use of study skills than their counterparts with both a moderate locus of control and moderate self-efficacy.

These results suggest that when students perceive control over reinforcement in their academic behavior, and/or they have confidence that their behavior will produce the intended result, they use more effective study skills. This is consistent with the scientific literature. Students with an internal locus of control tend to attend more classes when they are not ill (Trice & Hackburt, 1989); begin assignments earlier and take fewer days to complete assignments (Janssen & Carton, 1999); use study behaviors that involve greater depth of processing (Onwuegbuzie & Daley, 1998); and perform better academically (Carden, Bryant & Moss, 2004). It seems that students with an internal locus of control are more effortful than their external counterparts due to expectations of control over reinforcement for academic behavior.

High self-efficacy is related to adjustment (Chemers, Hu, & Garcia, 2001), greater academic performance and persistence (Multon, Brown, & Lent, 1991), success in science courses (Andrew, 1998), and higher levels of help seeking (Ryan, Gheen, & Midgely, 1998). When students are confident their behavior will produce the intended effect, they are more likely to put forth the effort to do well. Even though the equation of academic performance is complex and multivariate, self-efficacy appears to be an underpinning of academic success; high self-efficacy is characteristic of an effortful and successful student.

These data suggest that as students adopt more external beliefs of reinforcement and have less self-efficacy, they use effective study skills at a less frequent rate. It may be that identifying students with both external beliefs of reinforcement and low self-efficacy would be a worthwhile starting point for educators aiming to improve how their students study, especially when students’ responses to questions about their study habits are influenced by social desirability. Thus, one of the ways that teachers can identify students who may not be studying effectively is through conversation. How students expect to be rewarded (locus of control) and how much confidence they express in whether their study habits actually work (self-efficacy) may be a subjective indicator of which students are at the greatest risk for not using established study techniques. In conversation, educators may be in a prime position to learn more about the potential causal link between locus of control, self-efficacy, and the use of effective study skills.

Moreover, it is possible that the relationship between locus of control, self-efficacy, and study skills is multi-directional. Educators could train high school students to use more effective study skills, thereby improving students’ self-efficacy and shifting their expectations of control from external to internal sources. Accordingly, increased use of effective study skills may then correspond with more internal expectations of control over rewards and greater confidence. Instead of locus of control and self-efficacy affecting study skills use, one may possibly reverse the relationship and manipulate study skills to affect locus of control and self-efficacy.

Few participants scored toward the external end of the academic locus of control scale or toward the low end of the self-efficacy scale. The range restriction notwithstanding, locus of control and self-efficacy form an attendant pattern of study skills use. If more scores toward the extreme ends of both scales were better represented in this study’s sample, this pattern would possibly be more pronounced. Extreme scores were not necessarily expected in a postsecondary edu-
cation sample, and this may be due to individuals with an external locus of control and/or low self-efficacy not pursuing postsecondary education. When students expect control of reinforcement to come from external sources and have low self-efficacy in their study habits, they may, therefore, be less likely to pursue education beyond high school. It is also possible that endorsing a high number of items on the low end of these scales may not be socially desirable. Future research could explore these possibilities by testing a high school sample and controlling for social desirability.

Although locus of control and self-efficacy were already strong predictors of academic performance, this study implies that locus of control and self-efficacy are related to academic performance through the effortful use of effective study skills. A more direct test of this hypothesis would be to examine study skills as a mediator in the relationship between locus of control, self-efficacy, and academic performance. Baron and Kenny (1986, p. 1,176) explained that “a given variable may be said to function as a mediator to the extent that it accounts for the relation between the predictor and the criterion.” It is perhaps through study skills that locus of control and self-efficacy have their effect on academic performance.

References