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Self-Leadership and Self-Regulated Learning: An Investigation of Theoretical Relationships

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SELF-LEADERSHIP AND SELF-REGULATED LEARNING: AN INVESTIGATION OF THEORETICAL RELATIONSHIPS

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The purpose of this study was to investigate the relationships between the behavior, motivation, and cognitive dimensions of self-leadership and self-regulated learning. This quantitative study used the Revised Self-Leadership Questionnaire measuring self-leadership, and the Learning and Study Strategies Inventory, Second Edition measuring self-regulated learning, to collect data. The sample was drawn from the undergraduate college student population of one small private university. The Pearson product moment correlation results indicated several weak-to-moderate relationships between self-leadership and self-regulated learning behavior, motivation, and cognitive strategy dimensions. This was a first attempt to compare the two self-regulation theories; the results indicate that SL and SRL are related. Future research should further investigate the relationships for possible cross application of the theories. Specifically, recommended research includes exploring SL as a method to teach SRL and SRL as an approach to promote professional and organizational learning.

INTRODUCTION

The workplace of the 21st century is highly technical, fast-paced, and unpredictable, requiring flexible, autonomous, team-oriented employees capable of making decisions and controlling their own work (Neck & Houghton, 2006). The same autonomous, independent self-regulation processes can improve the academic success of college students (Schloemer & Brenan, 2006). Self-regulation processes have grown in importance in the workplace, as well as in learning and study. The need for employees and students to engage in self-regulating strategies has gained interest in practice and in the literature as a means to improve performance and organizational effectiveness (Boekaerts & Cascallar, 2006; Neck & Houghton, 2006).

Self-regulation, a concept of social cognitive theory, is a natural human process of monitoring and adjusting behavior to meet standards (Bandura, 1986). The dimensions of self-regulation derive from the reciprocal triadic scheme of determination. The individual's behavior, cognition, and other personal factors are interrelated. Each factor works as a determinant of the others (Bandura, 1986). Self-leadership (SL) and self-regulated learning (SRL) share this integrated triadic model in the dimensions of behavior, motivation, and cognition (Manz, 1986; Schunk & Zimmerman, 1998).

SL and SRL share the common tenets of self-regulation theory, in that the individual naturally self-regulates behavior, motivation, and cognition. Furthermore, the individual has the ability to set individual standards, set goals to meet those standards, and use behavior, motivation, and cognitive strategies to adjust action in accomplishing goals (Bandura, 1986).

Researchers have examined SL and SRL from different perspectives and SL has evolved as a normative theory to improve performance with application in the workplace (Carmeli, Meitar, & Weisberg, 2006; Neck, 1996; Neck & Manz, 1996; Prussia, Anderson, & Manz, 1998). Normative theories are prescriptive; stating what should or ought to be (Neck & Houghton, 2006). The prescribed SL strategies are effective at enhancing performance, as supported in the research from other fields such as psychology and sports psychology (Manz & Neck, 2004; Neck, Stewart, & Manz, 1995). SL theory prescribes a set of behavioral, motivational, and cognitive strategies working together to enhance self-awareness, intrinsic motivation, and positive thought patterns of individuals (Neck & Houghton, 2006).

The descriptive theory of SRL describes the study and learning strategies students engage in during the learning process. The empirical research described the student's use of SRL strategies and outcomes from using those strategies. SRL deals with information processing, which includes cognitive, motivational, affective, and contextual factors (Heikkilä & Lonka, 2006). As with the triadic model of social cognitive theory, SRL has three components, which are (a) behavior, (b) motivation, and (c) cognition (Pintrich, 2004; Zimmerman, 2002).

There is continued interest in advancing the knowledge of SL in relation to other self-regulation theories (Neck & Houghton, 2006). SL extends the descriptive theories of self-regulation, social cognitive, self-control, and intrinsic motivation, enabling the individual to achieve higher levels of performance (Neck & Houghton, 2006). SRL is a descriptive self-regulation theory with the same origins in social cognitive theory as SL (Bandura, 1986; Zimmerman & Schunk, 2001). The purpose of this study is to investigate the associations between the behavior, motivation, and cognitive dimensions of SL and SRL. If associations are indicated, SL may be used to teach SRL to students and professionals.

SELF-LEADERSHIP STRATEGIES

SL is an expanded view of earlier self-regulatory processes derived from social learning theory (Bandura, 1977), self-control (Carver & Scheier, 1981), and self-

management (Hackman, 1998). SL is an individual self-influence process wherein the individual practices strategies in order to enhance individual self-awareness and intrinsic motivation, and the individual develops habitual positive thought patterns (Manz, 1986). SL influence strategies are broken into three distinct components: (a) behavior focused strategies, (b) natural rewards, and (c) cognitive thought patterns (Manz, 1986, 1992).

Behavior strategies increase self-awareness through a looping process of evaluation, regulation, and feedback (Manz, 1986). Five behavioral strategies are identified: (a) self-observation, (b) self-goal setting, (c) self-reward, (d) self-punishment, and (e) self-cueing (Manz & Neck, 2004). Self-observation is a monitoring strategy. The objective of self-observation is to identify behavior patterns and assess which behaviors are constructive and should be continued, as well as which behaviors are destructive and should be eliminated (Manz, 1986). The individual seeks to find meaning in behavior and determine when to use a specific behavior. Self-observation provides a feedback evaluation system that allows the individual to monitor his or her own performance (Manz & Neck, 2004).

Self-goal setting strategies examine long-term, intermediate, and short-term goals for both personal and professional aspects of life (Manz, 1992). The assessment includes determining the congruence between goals and evaluating whether the goals are realistic. Research indicated that setting challenging and specific goals improves performance (Locke & Lathem, 1990).

Self-reward refers to creating both mental and physical incentives that motivate the individual to achieve goals. For example, self-reward incentives could include self-praise for goal completion or physical incentives, such as a special dinner or vacation (Manz, 1992). The other side of self-reward is self-punishment. Self-punishment is self-criticism or a negative reaction to failure. People use self-punishment as a form of self-regulation in much the same way as self-reward, but as negative reinforcement, rather than positive reinforcement. An individual should not overuse the self-punishment as a strategy (Manz & Neck, 2004). Both self-reward and self-punishment represent reactions to goal attainment or failure (Sims & Manz, 1996).

Self-cueing. The objective of the cueing strategy is to set up a system of reminders to keep the individual moving toward his or her goal. The cueing system should be one that works with the individual's personal style. The cues include visual, model, and environmental reminders of desired behavior (Manz & Neck, 2004).

Natural rewards comprise the motivation component of SL that refers to the inherently satisfying portions of the task. The goal of natural rewards is to enhance the individual's intrinsic motivation in performing the task (Manz & Neck, 2004). Natural rewards include identifying and enhancing the parts of a task that the individual enjoys and focusing thoughts on the enjoyable aspects of the task (Manz, 1992).

Constructive thought patterns make up the cognitive component of SL that focuses on strategies that develop opportunity thinking (Neck, Neck, Manz, & Godwin, 1999). Dysfunctional thought patterns inhibit performance; therefore, the objective of thought self-leadership is to develop habitual positive thought patterns (Manz, 1986). These constructive thought patterns promote positive thinking, which improves individual performance and general well-being (Manz, 1992). Manz (1992) outlined three cognitive strategies: (a) evaluating beliefs, (b) using imagination, and (c) using self-talk.

Evaluating beliefs allows the individual to improve his or her belief system by identifying beliefs, values, and assumptions (Neck & Manz, 1996), challenging the assumptions, and then eliminating dysfunctional beliefs. Examples of dysfunctional thinking include believing that situations are black or white, focusing on one negative aspect of a situation, distorting the situation, and limiting possibilities (Neck, Smith, & Godwin, 1997).

Using imagination to visualize performance is not unique to SL. Mental imagery has been researched and used across several fields and has been found to enhance performance (Finke, 1989). Research in sport psychology, clinical psychology, and counseling education has addressed the relationship between mental imagery and performance. The findings have shown that mental imagery enhances cognitive processing and suggests a positive relationship with successful performance (Neck & Manz, 1992).

Constructive self-talk reinforces the positive thoughts and motivations the individual has learned. Research indicated that self-talk enhances performance (Manz & Neck, 2004). The objective of the self-talk strategy is to develop and maintain constructive self-talk patterns and then continue the constructive self-talk through practice (Godwin, Neck, & Houghton, 1999). The same behavior, motivation, and cognitive strategy dimensions are found in SRL.

SELF-REGULATED LEARNING STRATEGIES

SRL is a self-regulation theory that describes a complete view of the behavior, motivation, and cognitive process (Zimmerman, 1990). This section reviews the research and current literature of SRL strategies. The SRL strategies reviewed here cover the three SRL dimensions of behavior, motivation, and cognition.

SRL behavior strategies consist of planning of effort and time, planning for self-observation, monitoring awareness, managing time, using help, adjusting effort, and choosing behavior appropriate to accomplishing the task (Pintrich, 2004).

Effort and time refers to the student's use of his or her understanding of the effort it takes to complete a task and the time for completion. The student utilizes time management along with goal setting and planning activities to allow enough time to complete study and learning tasks. The student uses monitoring and self-observation to evaluate

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learning progress (Zimmerman, Greenberg, & Weinstein, 1994).

Monitoring and self-observation allows the student to be aware of progress and judge whether a strategy is working. If a strategy is not working, SRL theory suggests that the student can adjust strategy (Zimmerman et al., 1994). Related to the notion of the ability to change strategies is the use of study aids and self-testing (Weinstein et al., 2002).

To change strategies, the student must be aware of various strategies. The use of study aids is a strategy wherein the student creates study aids to enhance the learning process. Self-testing is a behavior related to monitoring and evaluation of learning. The student practices the learning tasks and tests his or her learning progress as a form of monitoring learning progress (Weinstein et al., 2002). Successful studying and learning also require student concentration.

Concentration, the ability to regulate behavior to stay focused on the studying and learning, relates to time management, time monitoring, and self-observation (Weinstein et al., 2002). The distracted student wastes time on non-learning tasks. Through careful monitoring and self-observation, the student can identify distracting activities and remain focused on the learning tasks (Zimmerman et al., 1994). The behavior strategies are linked in the self-regulated triadic model (Bandura, 1986), in that self-efficacy of the learning task plays a role in the cognitive perception of whether the student believes he or she can accomplish the task, thereby allowing enough time and effort to accomplish the task and the motivation associated with the effort (Schunk, 2001). The next section reviews motivation strategies and the role of motivation in the SRL process.

According to McCombs and Marzano (1990), motivation is a primary component of SRL; the motivation derives from the student's recognition that he or she is a creative agent and is responsible for learning self-determination and self-development. Motivation refers to making efficacy judgments, adopting a goal orientation, activating task value and interest, perceiving the difficulty of the task, selecting appropriate strategies for managing motivation, and displaying affective reaction (Pintrich, 2004).

Motivation in self-regulation relates to the SRL volition perspective (Shunk & Zimmerman, 1998). Volition is the decision to take action that assumes the motivation to act in a certain way is present. The student makes judgments as to the value-expectancy of academic performance and acts to accomplish the task (Corno, 2001). The student compares academic goals and motivation with other life goals and places value on the learning activity (Weinstein et al., 2002).

Some researchers have explored the student's ability to regulate motivation (Corno, 2001; Wolters, 1998). The volition literature identified motivation strategies of interest enhancement and environmental structure (Corno, 2001; Wolters, 2003a). Other strategies identified were self-consequenting and goal self-talk (Wolters, 1998).

Using interest enhancement strategies makes boring or routine tasks more enjoyable and leads to task completion (Wolters, 2003a). The use of environmental structure strategy mentally and physically prepares the student for the learning task. The student may choose a quiet place to study or find a place to avoid distractions. The environmental structure strategy could include time management activities such as keeping a calendar of times and dates of deadlines and due dates. These strategies work specifically to remove obstacles from the physical and mental environment that may impede motivation (Wolters, 2003a). Environmental strategies could compare to the natural reward and cueing strategies of SL (Manz & Neck, 2004).

Self-consequenting strategies regulate motivation. In using this strategy, the student would self-set external rewards or punishments for completing tasks. Wolters (2003a) indicated that these strategies have worked to affect persistence behavior in completing the task. From a volition perspective, the contingent reward or punishment serves as an incentive to complete the task. This relates to the self-reward and self-punishment of SL (Houghton & Neck, 2002).

Goal oriented self-talk consists of statements of reinforcement that remind the student of the reason for completing the task. This strategy is associated with mastery goal orientation. Research indicated that mastery goal orientation self-talk is linked to intrinsic motivation regulation, which is related to critical thinking and other cognitive strategies (Wolters, 2003a).

The cognitive component of SRL refers to setting goals, using prior knowledge, activating metacognitive knowledge, monitoring cognition and metacognitive awareness, making cognitive judgments, and selecting appropriate strategies (Pintrich, 2004). The use of prior knowledge deals with information processing. Information processing is the ability to organize and utilize prior knowledge in a current learning task (Winne, 2001).

Goal setting strategies of self-regulation are supported by goal setting literature. Goals should be realistic, challenging, and attainable. Short-term goals are easier to manage and measure than are long-term goals (Locke & Lathem, 1990). Training students in realistic goal setting improves the students' goal strategies. Setting goals and actively monitoring progress increases self-efficacy. Once a student achieves a goal, then a new, more challenging goal could be set, increasing the learner's confidence in his or her academic ability (Schunk, 1990).

The literature suggested that emotion regulation is a motivational strategy. Emotion regulation relates to test anxiety. The strategies focus on maintaining positive emotions, which help academic functioning. Self-affirmation strategies are cognitive strategies wherein the student finds positive evaluation of self to stay motivated to complete the task and avoid negative emotion that can lead to dysfunctional academic performance (Wolters, 2003a).

Paulsen and Feldman (2005) examined the effects of a student's epistemology beliefs, or knowledge of knowing, as a variable of cognitive and metacognitive self-regulation. Students with sophisticated epistemology beliefs believe knowledge can increase through effort and regulation. These students engage in regulation that increases knowledge (Paulsen & Feldman, 2005). When a student believes that knowledge is constructed, as opposed to fixed, the student engages in deeper level information processing learning strategies, such as elaboration and integration of information. These strategies lead to improved academic performance (Muis, 2007).

The literature indicated that SL and SRL are self-regulation strategies with behavior, motivation, and cognitive dimensions. The application of SL has focused on workplace applications, whereas SRL has focused specifically on the self-regulated learning strategies of students (Neck & Houghton, 2006; Zimmerman, 1990). This study investigated the theoretical relationships between the strategies of SL and SRL.

In addition to the mutual foundation in self-regulation theory, some concepts of SL compare to SRL; several similarities appear in the strategies and outcomes of SL and SRL. In the bounds of the self-regulation model of behavior, motivation, and cognitive strategies, the prescribed strategies of SL are in the descriptive models of SRL strategies. For example, both theories propose forms of self-observation, self-set goals, cueing, self-reward, self-punishment, rehearsal, environmental control, self-talk, visualizing success, and cognitive and behavioral awareness strategies (Manz & Neck, 2004; Wolters, 2003b).

Research indicated that SL increases self-efficacy (Prussia et al., 1998), intrinsic motivation, high order cognitive skills, and cognitive awareness (Neck & Houghton, 2006). Likewise, research indicated SRL increases self-efficacy (Hsieh, Sullivan, & Guerra, 2007), intrinsic motivation and metacognition (Pintrich, 2004), and mastery goal orientation (McCombs & Marzano, 1990). A difference between SL and SRL is context. SL is a set of strategies an individual would use to achieve higher levels of performance, applied to a broad range of goals (Neck, & Houghton, 2006). SRL is focused specifically in the context of learning, examining the strategies that students use to regulate learning (Boekaerts & Cascallar, 2006).

Considering the similarities between these self-regulation constructs, it seems reasonable to propose that a relation exits between SL and SRL. Prior to this study, no mention has been made of the possible connection between SL and SRL in the literature. There is support for the hypotheses that there are similarities between the two theories. Additionally, there are valid instruments to measure SL and SRL (Houghton & Neck, 2002; Weinstein et al., 2002).

HYPOTHESES

The behavior, motivation, and cognitive dimensions of SL and SRL were the focus of this investigation. Table 1 presents a matrix framework of the dimensions and strategies tested in the following the following hypotheses of this study:

H1$_A$: The SL behavior dimension is related to the SRL behavior, motivation, and cognitive dimensions.

H2$_A$: The SL motivation dimension is related to the SRL behavior, motivation, and cognitive dimensions.

H3$_A$: The SL cognitive dimension is related to SRL behavior, motivation, and cognitive dimensions.

METHODS

The population of interest was undergraduate students from small private universities in the Southwestern United States. Data were collected from first- and second-year, and third- and fourth-year student participants across two colleges. Participation in the study was voluntary. The sample consisted of 43 males and 72 females; 64 from college one and 51 from college two; and 39 first- and second-year students and 76 third- and forth-year students, for a total of 115 participants. A minimum of 30 responses was collected from each group, to ensure a normal distribution among the four subgroups according to the central limit theorem (Cooper & Schindler, 2006).

Measurement

This study examined the SL strategies measured by the Revised Self-leadership Questionnaire (RSLQ) and the SRL strategies identified in the Learning and Study Strategies Inventory, Second Edition (LASSI). The RSLQ is currently the only valid instrument used to measure self-leadership. The behavior, motivation, and cognitive strategies measured are the same as those outlined previously (Houghton & Neck, 2002).

The literature indicated several instruments measure SRL (Entwistle & McCune, 2004). However, the LASSI was selected for this study because the LASSI has been used to predict college success, and it has been used in several studies as a pre-test and post-test to measure learning success. The LASSI addresses SRL and it is not constrained to a particular learning situation. The LASSI is a diagnostic tool used in colleges to assess the need for learning intervention in poorly performing students. The continued use and validation of the LASSI builds confidence in its use (Weinstein et al., 2002).

The Revised Self-leadership Questionnaire (RSLQ) is a 35-item survey measuring SL behavior, motivation, and cognitive dimensions on nine subscales (see Table 1). The measurement is a Likert-type scale from 1-5. The responses

range from 1 = not at all accurate to 5 = completely accurate (Houghton & Neck, 2002). The LASSI is an 80-item survey with 10 subscales measuring SRL (see Table 1). The measurement scale is a Likert-type scale from a-e. The responses range from a = not at all typical of me to e = very much typical of me. Each item is scored from a total of all items in each scale from 8 to 40. To strengthen the results of the inventory, some items within each scale are reverse scored (Weinstein et al., 2002).

The preliminary data preparation consisted of descriptive statistics, box plots to detect outliers, and histograms to observe normal distribution. The overall SL and SRL scores by gender and college, and by gender and student status were used to detect outliers. These groupings were chosen because sufficient data were present for the analysis to establish normal distribution. It was assumed that samples with over 30 cases had a normal distribution (Norušis, 2005). After examination of the data for outliers, histograms of the SL and SRL total scores were used to depict the distribution of the data. The histogram depicted normal distribution of the data. The SL and SRL scale scores were assumed normally distributed for the total sample.

After establishing normal distribution, a one-sample t test was used to establish validity of the RSLQ and LASSI for the study sample. The one-sample t test was used to test the null hypothesis that the sample means came from the RSLQ validation population. The two assumptions of the one-sample t test are that the observations are independent and that the distributions are normal (Norušis, 2005). Independence was assumed because each case or observation represented the response of one person.

The RSLQ has been validated with college student populations (Houghton & Neck, 2002) and found to be valid among adult populations (Carmeli et al., 2006). Therefore, the RSLQ was assumed valid for this study. The RSLQ scale has five items for the natural reward scale. The validation process revealed three factor items (Houghton & Neck, 2002). At a confidence level of 99%, the null hypothesis was rejected for the self-reward scale and natural reward. The study compared SL and SRL within a limited population, so the results could not be generalized. The result was not considered detrimental to the sample analysis.

The LASSI has been validated over time and has published national averages (Weinstein et al., 2002). At a confidence level of 99%, the result of the one-sample t test indicated the attitude, concentration, and time management scales null hypotheses were rejected. Even though the means did not match the national norms, this did not preclude the LASSI from being used in this examination of relationships between SL and SRL. The results were limited to the sample population and the sample has a normal population (Norušis, 2005).

ANALYSIS

To examine the relationships between SL and SRL as measured by the RSLQ and LASSI, the Pearson product-moment correlation was used to test the hypothesized relationships. The Pearson correlation assumes linearity between variable and a bivariate normal distribution (Cooper & Schindler, 2006). The assumptions for the Pearson product-moment correlation were established before testing the hypotheses. The correlation test was performed for each SL and SRL scale strategy combination indicated in the Table 1 matrix.

The Pearson product-moment correlation test was used to measure the strength of the relationships. The significant relationship at a confidence level where p < .001 are listed in Table 1. To interpret the association relevancy and strength, the following guide was used (Bryan, 2007):

Very strong association:	± .90 - ± 1.00
Strong association:	± .70 - ± .90
Moderate association:	± .50 - ± .70
Weak association:	± .30 - ± .50
Little if any association:	± .00 - ± .30

RESULTS

Table 1 lists the moderate and weak associations discussed in this section. The most dominant SL scales were self-goal setting, self-observation, and self-cueing. The dominant SRL scales were self-testing and information process. These scales indicated associations across the behavior, motivation, and cognitive dimensions, which may indicate these components are key self-regulation strategies that drive the reciprocal process (Bandura, 1986).

Hypothesis Analysis

Hypothesis 1. Goal setting is among the SL behavior strategies, but is a cognitive strategy of SRL information processing. The relationship found between SL self-goal setting and SRL self-testing and time management indicated goal setting is involved in the SRL behavior process. SRL self-testing and time management were related to SL self-cueing and self-observation, respectively. This may indicate a reciprocal relationship between the behavior strategies in support of goal accomplishment. The SL self-cueing relation to SRL support technique strategies may indicate that the development and use of study aids is a form of cueing (Weinstein et al., 2002). SRL self-testing includes monitoring and comprehension of learning. The SL self-cueing relation to SRL self-testing may indicate that cueing is part of the self-monitoring process.

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Table 1: SL and SRL Moderate and Weak Associations

	H1					H2	H3		
	SL Behavior strategies					SL Motivation	SL Cognitive		
	Self-goal Setting	Self-Reward	Self-Punishment	Self-Observation	Self-Cueing	Natural Rewards	Visualizing Successful Performance	Evaluating Beliefs and Assumptions	Self-Talk
SRL Behavior									
Concentration				.409*					
Self-testing	.506**			.428*	313*		.326*	.324*	
Support Techniques				.414*	.408*				
Time Management	.390*			.540**					
SRL Motivation									
Anxiety									
Attitude				.337*					
Motivation	.438*			.609*					
SRL Cognitive									
Information Processing	.470*	.389*		.410*	.376*	.403*		.412*	
Selecting Main Idea				.311*					
Test Strategies									

* Weak associations
** Moderate associations

SL self-observation in relation to SRL concentration would support the self-monitoring nature of self-regulation (Manz & Neck, 2004; Zimmerman, 2002). Concentration involves focusing on the learning task, while controlling feeling and thoughts (Weinstein et al. 2002). This would also support the double feedback in the monitoring and cueing. The findings support the hypothesis that SL behavior strategy and SRL behavior dimensions are related.

The association between SL self-observation and SRL motivation was the strongest relationship. This may indicate that self-observation is part of the motivation process. The student is motivated to complete school, accepts responsibility to achieve the goal, and uses self-observation to monitor progression (Zimmerman, 2002). The association found between SL goal setting and SRL motivation and SL self-observation and attitude, supports this assertion. The student sets a goal to achieve (SL self-goal setting), accepts responsibility for goal achievement (SRL motivation), understands how goals are related (SRL attitude), and monitors progress (SL self-observation). The reciprocal nature of the self-regulation process was shown in the SL cognitive and SRL behavior, and SL motivation and SRL cognitive dimensions.

The relationships between SL behavior and SRL cognitive dimensions may be an indicator of the general nature of information processing, while selecting the main idea and test strategies are learning-specific processes. Information processing includes elaboration, mental imagery, organization strategies, and reasoning skills (Weinstein, et al. 2002). These strategies are not specific to learning. Therefore, these attributes may support information processing as a general self-regulating strategy that may be used by individuals in self-regulation. Though this study did not address that particular issue, future research could further explore the impact of information processing strategy on self-regulation. SL self-observation was also associated with SRL information process and selecting main ideas. These strategies both include monitoring progress. This would indicate that self-observation is also a cognitive process, which further supports the reciprocal nature of self-regulation and the key part self-observation plays in the overall process.

Hypothesis 2. The examination of the motivation scales revealed no significant associations. This may indicate that the scales of the RSLQ and LASSI measure motivation in different ways. Even though SL and SRL claim to focus on intrinsic motivation (Manz, 1986; Zimmerman, 2002), the findings here did not support that the RSLQ and LASSI measure intrinsic motivation in the same way. The result assumes the motivation scales of the RSLQ and LASSI were designed to measure intrinsic motivation. The natural rewards and information processing association may indicate

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a cognitive component of intrinsic motivation. However, it may also indicate that the natural reward strategy is more of a cognitive than a motivational strategy.

Hypothesis 3. The SL evaluating beliefs and assumptions and SRL information processing relationship would indicate the deep processing nature of both strategies (Manz & Neck, 2004; Zimmerman, 2002) or that the scales are measuring the same cognitive functions. The individual engages in deeper cognitive processes with these techniques, rather than merely surface processes, as supported in the SRL literature (McCollum & Kajs, 2007). It is interesting to note that there was not a relationship with SL visualizing successful performance and SRL information processing. Information processing deals with using mental imagery (Weinstein et al. 2002), which is the same cognitive process as visualizing successful performance (Manz & Neck, 2004; Zimmerman, 2002).

The relationship between the SL cognitive visualizing success and evaluating beliefs and assumptions, and SRL behavior self-testing may indicate that the cognitive process acts in a reciprocal manner with the behavioral monitoring process. This could also indicate that evaluating beliefs and assumptions are part of the monitoring process. The student would routinely reevaluate beliefs and assumptions about his or her learning process as part of the monitoring process. Visualizing successful performance is a constant part of the cognitive process (Manz & Neck, 2004). This would support the notion that the visualizing successful performance component would be a constant part of the learning monitoring and comprehension process.

DISCUSSION

The purpose of this study was to examine the relationships between SL and SRL behavior, motivation, and cognitive dimensions. The associations resulting from this study indicate a relationship between SL and SRL. This study was a first step in relating SL and SRL self-regulation theories.

The most prevalent strategy is SL self-observation. This strategy is associated with SRL behavior, motivation, and cognitive dimensions. Self-observation is a key aspect in the double feedback loop described in the SL literature (Manz, 1986) and in the metacognitive process described in the SRL literature (Pintrich, 2004). Self-goal setting also cuts across the SRL dimensions. This result would support the SL and SRL literature in that goal setting, whether a cognitive or behavior action, is a foundation of self-regulation.

The objective of self-regulation is to achieve self-set goals (Bandura, 1986). SRL identifies goal-setting as a cognitive strategy (Pintrich, 2004). SL identifies goal-setting as a behavior. The findings of this study indicate that self-goal setting as measured with the RSLQ is associated across the SRL behavior, motivation, and cognitive dimensions, therefore indicating that goal setting is involved in the reciprocal process of self-regulation. SL self-cueing and

SRL self-testing strategies may also play a role in the goal achievement process.

SRL self-testing is a similar strategy that involves monitoring which in essence is a cue. Self-cueing and self-testing show an association as well as self-testing and self-observation. The mental reminders or self-observation may be similar to visualizing successful performance and evaluating beliefs. This shows an association between SL and SRL

CONCLUSIONS

The implication of this research is to provide a step in reconciling SL and SRL as self-regulation theories. The findings here support the notion that SL and SRL theories examine the same self-regulation processes. Houghton and Neck (2002) suggested further research to compare SL with other self-regulation theories. This study is one step toward closing this gap. The relationships found here could assist in understanding and expanding the constructs of SL and SRL theories. Future research should explore cross application of the theories, measurement, and the reciprocal interaction of the strategies. Specifically, recommended research includes exploring SL as a method to teach SRL and SRL as an approach to promote professional and organizational learning.

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