2012

Self-Regulated Learning: Metacognition, Motivation and Academic Achievement in Middle School Students

Merrill Brady

Trinity College
HARTFORD CONNECTICUT

Self-Regulated Learning: Metacognition, Motivation and Academic Achievement in Middle School Students
Merrill Brady '12
Faculty Advisors: Dina Anselmi and David Reuman; Community Partner: Debra Avery, HMTCA

Abstract

Self-regulation is a highly effective way of learning, where students are active participants in their own learning processes. The connection between self-regulated learning and academic success has led researchers to ask the question of whether we can teach students to become self-regulated learners (Schraw, Crippen, & Hartley, 2006). Self-regulation has been identified to have two underlying sub-components, metacognition and motivation. Research has found that most students are not explicitly taught the necessary metacognitive skills that are needed to develop self-regulated learning habits (Ambrose et al., 2010). Therefore, I conducted a self-regulated learning intervention in an eighth grade social studies classroom, which focused on teaching metacognition. The purpose of the intervention was to investigate its utility in enhancing not only students' metacognitive skills, but also their motivation and grades. I predicted that the intervention would be successful at increasing all three; my results did not support my predictions. Future interventions of greater length and scope may result in more significant results.

Introduction

A Model of Self-Regulated Learning
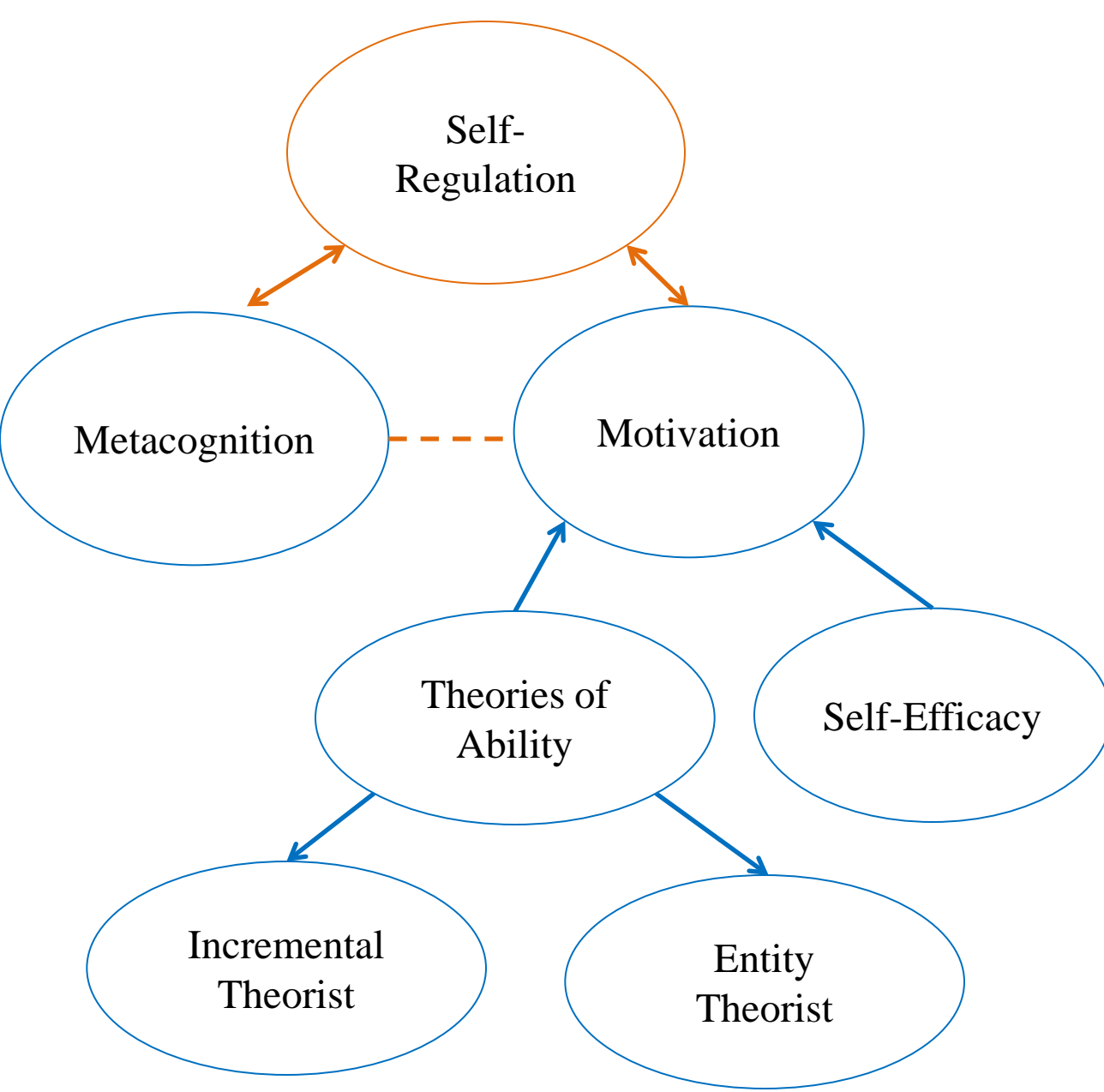
Self-Regulated Learning Definitions:

Metacognition: One's ability to reflect and control their cognitions
- Metacognitive skills: assessing, evaluating, planning, application of strategies and monitoring performance, reflection and adjustment

Motivation: Composed of two subcomponents:
1. **Theories of Ability**: one's belief about intelligence
   - **A. Incremental Theorist**: Belief that intelligence is changeable and can be improved with practice
   - **B. Entity Theorist**: Belief that intelligence is fixed and not able to be changed
2. **Self-Efficacy**: One's confidence about their learning and academic ability

In order to become self-regulated learners, students must both develop and use metacognitive skills. Motivation is also necessary for self-regulation, but researchers have found metacognition to play a more essential role in the regulation process.

The process by which students acquire self-regulation is not fully known, but research has found that:
- A student's motivation and metacognition impacts their academic and self-regulation abilities
- Metacognitive interventions are more effective than motivation interventions

What does the self-regulated student look like?
- Incremental theorist
- High self-efficacy
- High levels of metacognition
- Academically successful

Current Study

The purpose of the current study was to design a self-regulated intervention that was:
- Focused on teaching students about metacognition and metacognitive skills
- Indirectly encouraged students to be motivated about their school work, academic abilities, and academic possibilities (through metacognitive instruction)

Aim of the current study: To investigate the effectiveness of the intervention in increasing students' metacognition, motivation and social studies grades

Hypotheses

H_1: Students who received the intervention would become more incremental in their beliefs about ability and intelligence.

H_2: Students who received the intervention would have an increase in their self-efficacy.

H_3: Students who received the intervention would become more metacognitively aware and increase their use of metacognitive strategies.

H_4: If hypotheses H_1 through H_3 were met, students who received the intervention would have an increase in their course grades.

Methods

Participants

42 eighth grade students from two classes from a middle school in the Harford Public School District participated in this study. Below is a summary of who these students are:

Gender:	42 Students: 52% Female, 48% Male
Race and Ethnicity:	2% Asian; 50% Hispanic; 19% Black; 21% White; 7% Multiple Ethnicity
Hometown:	45% from Hartford; 55% from surrounding suburbs near the Hartford District

Measures

Measure 1: Ability Beliefs
Students answered questions such as: *"You have a certain amount of intelligence, and you really can't do much to change it."*
- *Those who agreed: Entity Theorist*
- *Those who disagreed: Incremental Theorist*

Measure 2: Self-Efficacy
Students responded to questions such as: *"I am sure I can do an excellent job on the problems and tasks assigned for this class."*
- *Answers ranged from "not at all true" to "very true of me"*

Measure 3: Metacognitive Awareness
Students responded to questions such as: *"I try to use ways of studying that have worked for me before."*
- *Answers ranged from "never" to "always"*

Measure 4: Performance
The students' teacher reported both pre-and post-treatment grades

Procedure
- Participants completed pre-and post tests consisting of the measures mentioned above
- One class = experimental treatment, the second class = control treatment
- Both groups participated in 6 treatment sessions. Table 1 illustrates what each group did over the 6 sessions.

Table 1. Treatment Groups

| Session	Experimental Treatment		Control Treatment	
	Lesson	Activity	Lesson	Activity
1	Learning Strategies for College*	Worksheet: What am I good at? What can I work on?	College Graduates versus Non-Graduates*	Worksheet: Why do you want to attend college?
2	How to Write an AMAZING Paper*	Handout: T-R-I-N-T-Y writing cards; Outline of paper on index cards	Application Process	Worksheet: Application crossword puzzle
3	Study Skills*	Demonstration: How to write a good flashcard; How to make a graphic organizer; Handout: Blank map of the 13 Colonies	Extracurricular Activities	Worksheet: M*A*S*H
4	Study Skills and Study-Guide*	Worksheet: Study Guide for upcoming test	College Interviewing Process*	Demonstration: Mock interview- what was good vs. bad?
5	Discussion about Exam Wrappers and Upcoming Mid-Term	Worksheet: Practice Mid-term exam	Resume	Discussion: What makes a good vs. bad resume?
6	College Tour	Information session; Walking Tour	College Tour	Information session; Walking Tour

Results

For each of the four measures above:
- I looked to see if there were significant differences in the measures for the experimental versus the control group.
- I looked to see if there were significant changes in the measures for pre versus post tests.
- I looked to see if time related change was the same for the experimental versus control group.

Results

Measure 1: Ability Beliefs

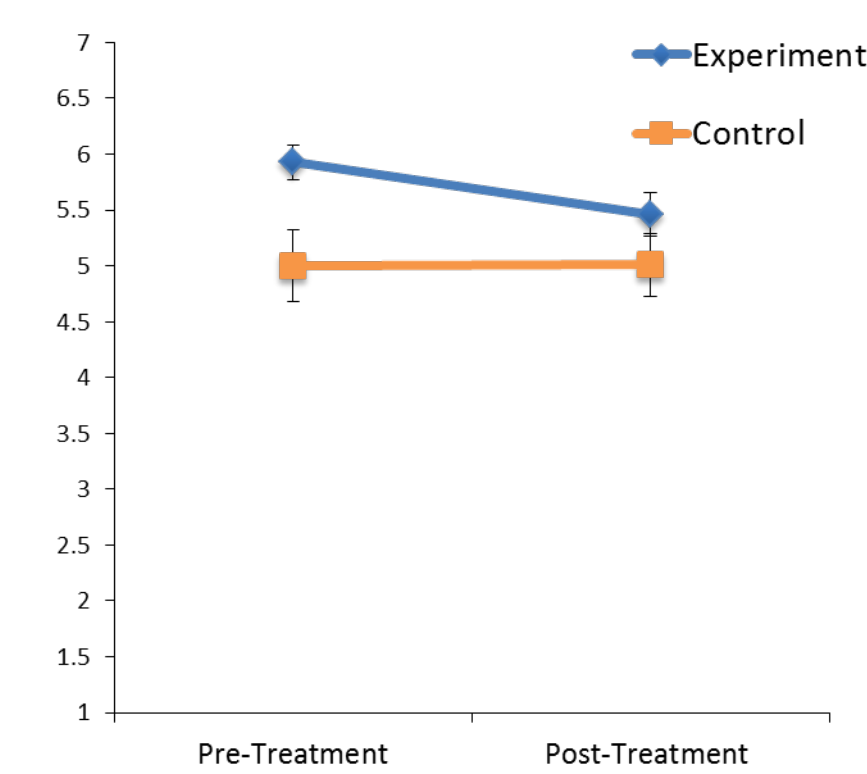*Figure 1.* Change in Ability Beliefs
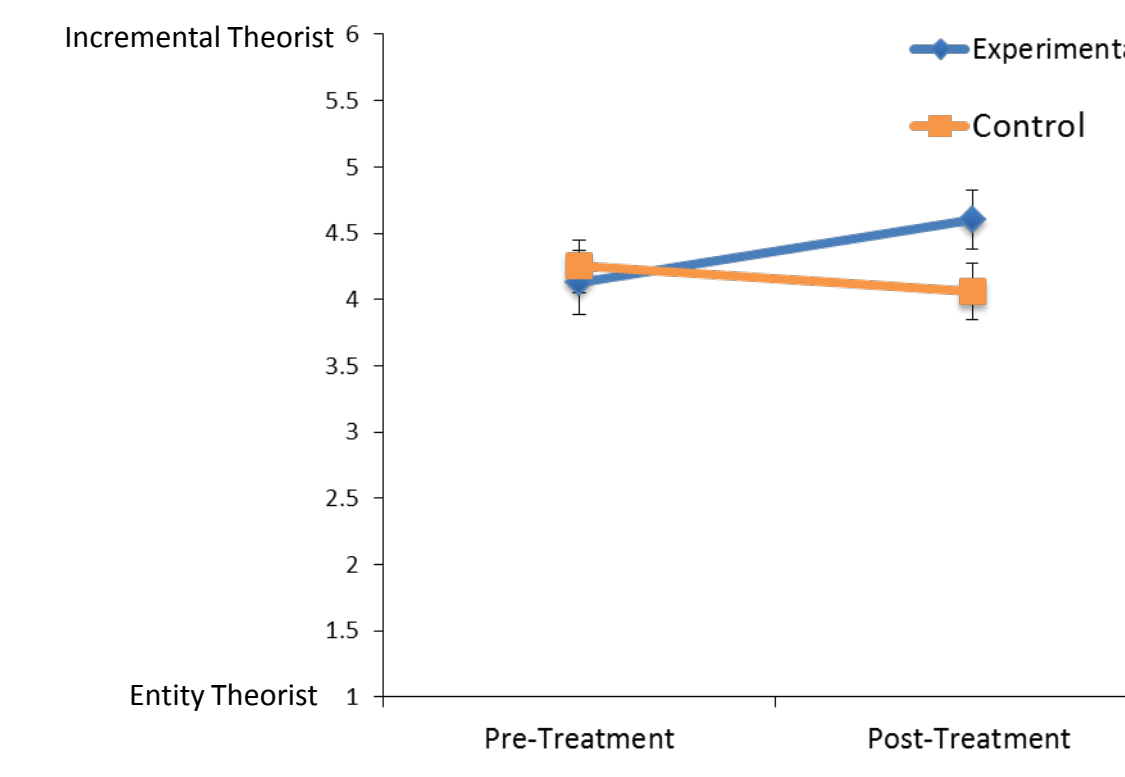
Result: Both groups showed no significant changes in beliefs about ability.
- Reject H_1

New Working Hypothesis: If the intervention was combined with explicit messages about the modifiability of intelligence I would expect the current trend to be significant.

Measure 2: Self-Efficacy

Figure 2. Changes in Self-Efficacy

Result: There was no significant effect of change, but the experimental group had significantly higher self-efficacy in comparison to the control group.
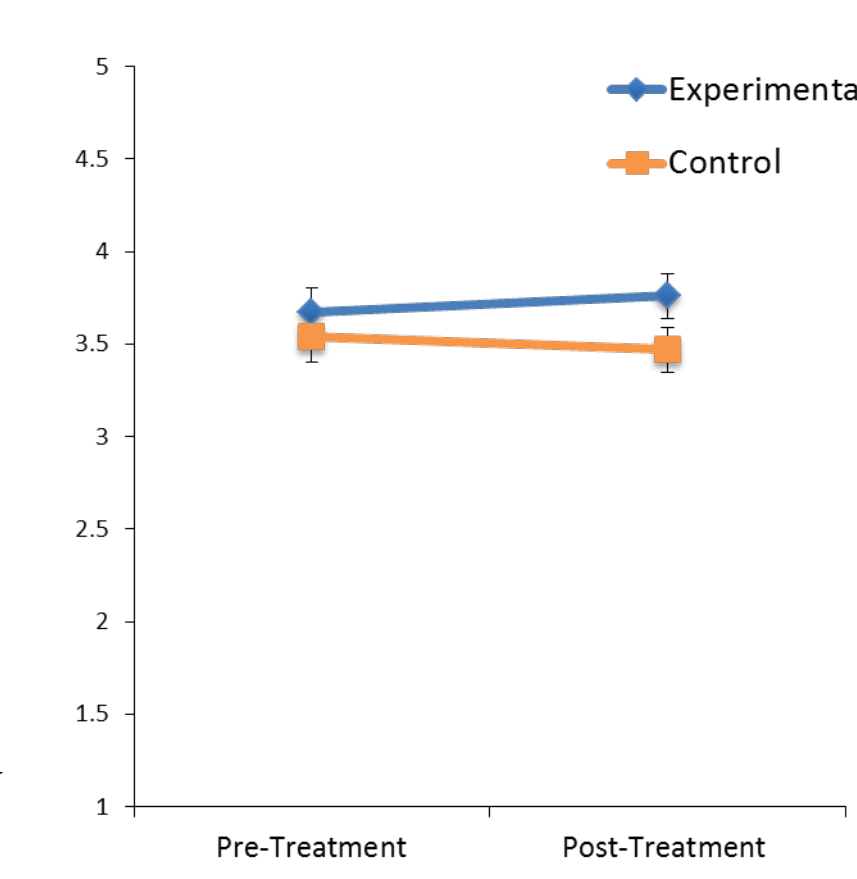- Reject H_2

New Working Hypothesis: If the intervention was combined with explicit messages focusing on increasing self-efficacy I would expect the experimental group's post-treatment self-efficacy to increase.

Measure 3: Metacognitive Awareness

*Figure 3.* Change in Metacognitive Awareness

Result: Both groups showed no significant changes in metacognitive awareness.
- Reject H_3

New Working Hypothesis: Future interventions should include more opportunities for practice and run for a longer period of time to allow for significant changes in metacognition.

Measure 4: Performance

Figure 4. Changes in Performance
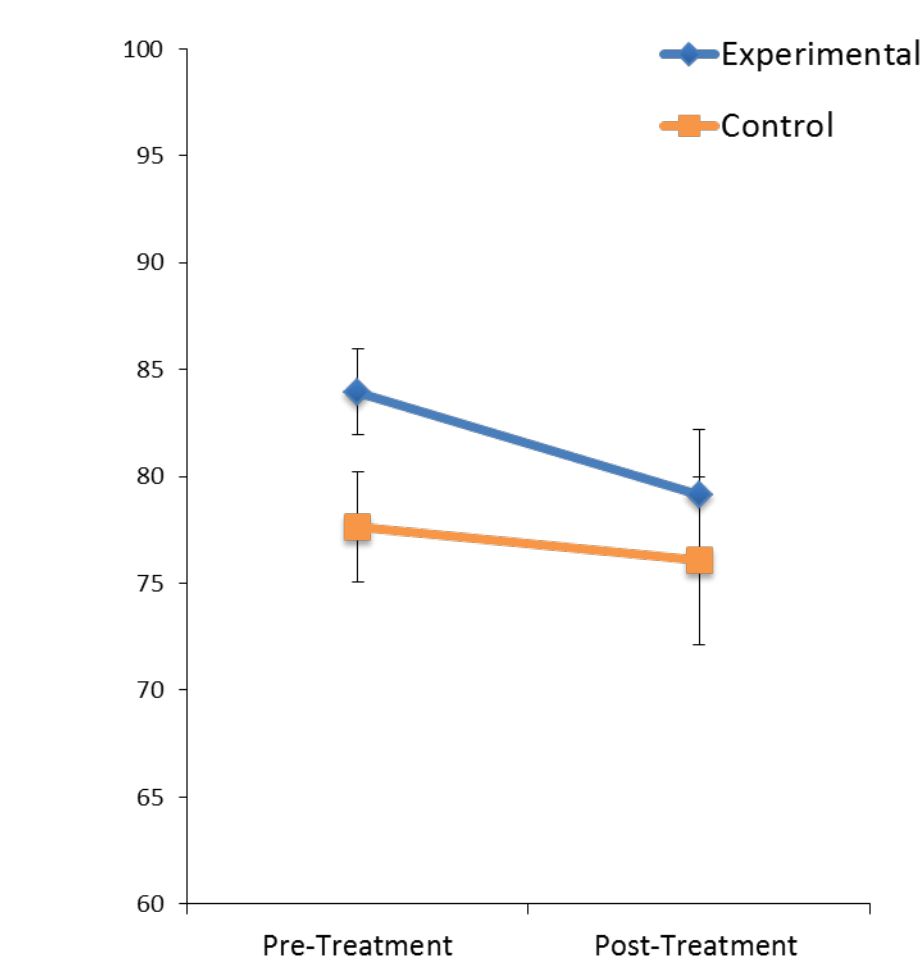
Result: There was no significant effect of change, but both groups' grades declined from pre-to post-treatment.
- Reject H_4

New Working Hypothesis: If all the other changes are made I would expect H_4 to be confirmed

Conclusion

Contrary to my hypotheses, I found no significant effects of the intervention on motivation (ability beliefs and self-efficacy), metacognition or performance (grades). Based on these initial results I have identified some limitations and generated some possible changes that future interventions should consider:

Limitations
- The amount of classroom time and number of sessions was too small for the intervention to have a significant effect
- Small sample size: need more classrooms
- Complexity of teaching metacognition and developing metacognitive strategies in students
- No explicit motivational components were included
- Students in both sections were exposed to a highly competent teacher who used various learning strategies

Future Directions
- Longer intervention
- Provide students with more opportunities to practice and integrate metacognition into schoolwork
- More focus on enhancing motivation specifically by focusing on activities that address beliefs in ability and self-efficacy
- Test the intervention out with more teachers and in more academic domains