Achievement goal orientations, cognitive learning strategy use, and continued professional learning plans of first-year occupational therapy assistant students

A. Lynne Umbarger
University of Toledo

Follow this and additional works at: http://utdr.utoledo.edu/theses-dissertations

Recommended Citation
Umbarger, A. Lynne, 'Achievement goal orientations, cognitive learning strategy use, and continued professional learning plans of first-year occupational therapy assistant students' (2015). Theses and Dissertations. 1930.
http://utdr.utoledo.edu/theses-dissertations/1930

This Dissertation is brought to you for free and open access by The University of Toledo Digital Repository. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of The University of Toledo Digital Repository. For more information, please see the repository’s About page.
A Dissertation

entitled

Achievement Goal Orientations, Cognitive Learning Strategy Use, and Continued Professional Learning Plans of First-Year Occupational Therapy Assistant Students

By

A. Lynne Umbarger

Submitted to the Graduate Faculty as partial fulfillment of the requirements for the Doctor of Philosophy Degree in Educational Psychology

________________________________________________________________________

Dr. Revathy Kumar, Committee Chair

________________________________________________________________________

Dr. Mary Ellen Edwards, Committee Member

________________________________________________________________________

Dr. Beth Ann Hatkevich, Committee Member

________________________________________________________________________

Dr. William Knight, Committee Member

________________________________________________________________________

Dr. Patricia R. Komuniecki, Dean

College of Graduate Studies

The University of Toledo

August 2015
An Abstract of

Achievement Goal Orientations, Cognitive Learning Strategy Use, and Continued
Professional Learning Plans of First-Year Occupational Therapy Assistant Students

By

A. Lynne Umbarger

Submitted to the Graduate Faculty as partial fulfillment of the requirements for
the Doctor of Philosophy Degree in Educational Psychology

The University of Toledo
August 2015

Occupational therapy (OT) is an allied health profession that helps people with
disabilities, cognitive or physical, participate in their lives as independently as possible.
An associate degree college education is required for the occupational therapy assistant
(OTA) professionals who implement the plans outlined by an occupational therapist and
provide skilled treatment activities with patients.

The purpose of this study was to explore the mastery and performance goal
orientations of new occupational therapy assistant (OTA) students after participation in a
highly competitive enrollment process and the relationships between any changes in their
personal goal orientations and related cognitive learning strategies (CLS), and plans for
continued professional learning (CPL) over time. In addition, the study sought to evaluate
any relationship between mastery and performance instructional practices on the
students’ personal goal orientations, use of deep processing and surface CLS, and plans
for CPL. Instructional practices in the classroom can be mastery and/or performance focused and are known to influence students’ goal orientations and use of CLS. The implications of mastery and performance goal orientations on the pursuit of learning has been documented in limited fashion with students who have completed a competitive admissions process and participate in the cohort educational format characterized by OTA students. In addition, instructors in professional educational programs are drawn from the clinic and may have limited instruction in motivational instruction that focuses on student self-improvement and less on achievement of grades which conflicts with a goal of occupational therapy education to develop lifelong learners.

This longitudinal investigatory study incorporated data from surveys of instructors and OTA students at the beginning and end of a class in the first semester and again in the next semester. The data from these surveys were analyzed with descriptive statistics, paired-sample t-tests, and growth curve modeling procedures. The findings showed that OTA students entered their educational program with both mastery and performance goal orientations, used both deep processing and surface CLS, planned for CPL even from the onset of their education, and had increased use of deep processing and surface CLS and CPL plans as they increased in mastery goal orientations.
I wish to thank my work colleagues, church friends, and other friends who have helped me get through the tough times and long days in class and at the computer. You listened patiently to my complaints, and you were happy when I had good news to report to you. You gave me support even when I had to run away from work to make it to class on time!

I wish to thank my church families for their support. Without you and your prayers, I don’t know how I could have done this program. Without music and the choirs, I would have never had any stress release! God bless you all.

Most importantly, I wish to thank my family. My parents supported me through the early college years and provided an example of perseverance to see the doctoral degree through to the end. Dad and Mom were great examples of getting by in the lean years and accomplishing the doctorate despite all odds. My daughter supported her mom in stressful times and in time away from home for class and writing. My husband was there for every step, twist, turn, disappointment, and joy. Without him, I could have never undertaken and completed the doctoral program!
Acknowledgments

I wish to thank Dr. Revathy Kumar and my dissertation committee members for their unflagging support of this dissertation. You read when you probably didn’t have time for reading. You kept me mastery-focused in my motivation. You were fine examples of scholarship in higher education.

I wish to thank all the occupational therapy assistant students and their educational programs for participating in this longitudinal study. You have helped the world to know more about the profession of occupational therapy and your importance to the profession.
Table of Contents

Abstract .......................................................................................................................... iii

Acknowledgments ........................................................................................................ vi

Table of Contents ........................................................................................................ vii

List of Tables ................................................................................................................ xiii

List of Figures ............................................................................................................... xv

List of Abbreviations .................................................................................................... xvi

I. Introduction ................................................................................................................ 1

A. Theoretical Framework of the Study ................................................................. 4

B. Statement of the Problem ...................................................................................... 8

C. Purpose of the Study ............................................................................................. 11

D. Significance of the Study ..................................................................................... 11

E. Research Questions ............................................................................................... 12

F. Research Hypotheses ........................................................................................... 13

F. Study Design ........................................................................................................ 15

G. Definition of Key Terms ...................................................................................... 16

H. Delimitations and Limitations ............................................................................. 18

a. Delimitations ...................................................................................................... 18

b. Limitations .......................................................................................................... 19
I. Overview of Upcoming Chapters .................................................................20

J. Summary ........................................................................................................21

II. Review of Literature ..........................................................................................23

A. Achievement Goal Theory ..................................................................................24

   a. Performance Goal Orientation ......................................................................25

   b. Mastery Goal Orientation .............................................................................27

   c. Cognitive Learning Strategies Associated with Performance and
      Mastery Goal Orientations ............................................................................29

   d. Instructional Practices and Students’ Achievement Goal
      Orientations ....................................................................................................32

   e. Summary .........................................................................................................36

B. Occupational Therapy Education .........................................................................37

   a. Admission ........................................................................................................38

   b. OTA Educational and Practice History ..........................................................39

   c. Instruction in OT Educational Programs .........................................................41

   d. Summary .........................................................................................................43

C. Continued Professional Learning .........................................................................44

D. Summary .............................................................................................................46

III. Methodology .......................................................................................................48
A. Research Questions .................................................................48

B. Research Hypotheses ..............................................................49

C. Population and Sample ............................................................51

D. Variables ..................................................................................53
   a. Dependent Variables ...............................................................53
   b. Independent Variables ............................................................53

E. Instrumentation ........................................................................54
   a. Instruments to Assess Student Goal Orientations, Cognitive Learning
      Strategies, and Plans for Continued Professional Learning ........55
   b. Instruments to Assess Mastery and Performance Instructional
      Practices ................................................................................58

F. Data Collection Procedures .......................................................59

G. Planned Data Analyses ..............................................................61
   a. Paired-Sample t-test Analyses ..................................................61
   b. Analysis of Variance (ANOVA) ..................................................62
   c. Growth Curve Modeling Analysis ..............................................62
   d. Instructional Practices (Research Question 1) ..............................70
   e. Students’ Personal Goal Orientations and Use of Cognitive Learning
      Strategies at Time 1 (Research Questions 2 and 3) .....................70

ix
f. Changes in Students’ Mastery and Performance Goal Orientations
   from Time 1 to Time 2 to Time 3 (Research Question 4) ............71

g. Changes in Use of Deep Processing and Surface Cognitive
   Learning Strategies With Mastery and Performance
   Goal Orientations as Predictors (Research Questions 5 and 7) .....71

h. Changes in Number of Plans for Continued Professional Learning
   With Mastery and Performance Goal Orientations as Predictors
   (Research Questions 6 and 8) ..........................................71

i. Relationship Between Instructional Practices and Changes in
   Students’ Personal Goal Orientations (Research Question 9) ......72

H. Summary .......................................................................................72

IV. Results ..........................................................................................74

A. Analyses and Results .......................................................................74

B. Descriptives: OTA Program, Instructor and Student Data ............75
   a. Descriptives: OTA Programs and Instructors .......................75
   b. Descriptives: Student Response ...........................................78

C. Results of Analyses for Research Questions ....................................................85

a. Instructional Practices (Research Question 1) ..................85

b. Students’ Personal Goal Orientations and Use of Cognitive Learning Strategies at Time 1 (Research Questions 2 and 3) ........86

c. Changes in Students’ Mastery and Performance Goal Orientations from Time 1 to Time 2 to Time 3 (Research Question 4).........89

d. Changes in Use of Deep Processing and Surface Cognitive Learning Strategies With Mastery and Performance Goal Orientations as Predictors (Research Questions 5 and 7) ...........91

e. Changes in Number of Plans for Continued Professional Learning With Mastery and Performance Goal Orientations as Predictors (Research Questions 6 and 8)..........................97

f. Relationship Between Instructional Practices and Changes in Students’ Personal Goal Orientations (Research Question 9) .....100

D. Summary .............................................................................................................101
V. Discussion ................................................................. 105
  A. Major Findings ................................................................. 108
  B. Discussion of Results ......................................................... 111
    a. Instructional Practices ....................................................... 111
    b. Goal Orientations and Use of Cognitive Learning Strategies .......... 112
    c. Plans for Continued Professional Learning (CPL) ....................... 115
    e. Relationship Between Instructional Practices and Students’ Goal Orientations ................................................................. 119
  C. Conclusions .................................................................. 120
  D. Recommendations ............................................................. 123
  E. Summary ...................................................................... 125

References ...................................................................... 127

Appendices

A. Student Goal Orientations, Cognitive Learning Strategies, and Plans for Continued Professional Learning Scales and Items ................................................................. 171
B. Instructional Practices Scale Items ................................................................. 177
List of Tables

Table 1. Typical Yearly Numbers of Applications Received and Students Accepted .....76

Table 2. Program Instructors’ Scores for Mastery and Performance Instructional Practices at Time 1 and Time 2 .................................77

Table 3. Accepted and Excluded Respondents at Each Assessment Time ....................78

Table 4. Response Rates for Each OTA Program by Assessment Time ......................79

Table 5. Average Psychometric Properties for Goal Orientations, Cognitive Learning Strategies, and Plans for Continued Professional Learning Scales across Time 1, Time 2, and Time 3 ................................................................................82

Table 6. Descriptives: Mastery and Performance Goal Orientations, Use of Deep Processing and Surface Cognitive Learning Strategies, and Plans for Continued Professional Learning (CPL) at Time 1, Time 2, and Time 3 ..........83

Table 7. Results of Paired-Sample t-test Analyses for Differences in Means for Goal Orientations, Use of Cognitive Learning Strategies, and Number of Plans for Continued Professional Learning..........................................................87

Table 8. Changes in Mastery and Performance Goal Orientations Over Time ............91

Table 9. Changes in Use of Deep Processing Cognitive Learning Strategies Over Time With Mastery and Performance Goal Orientations as Between-Student Predictors .................................................................................................................94
Table 10. Changes in Use of Surface Cognitive Learning Strategies Over Time

With Mastery and Performance Goal Orientations as Between-Student Predictors

Table 11. Changes in Number of Plans for Continued Professional Learning (CPL) Over Time With Mastery and Performance Goal Orientations as Between-Student Predictors
List of Figures

Figure 1. Means of students’ performance and goal orientations in each program at Time 1..........................................................88

Figure 2. Means of students’ use of surface and deep processing cognitive learning strategies in each program at Time 1............................89
List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACOTE</td>
<td>Accreditation Council for Occupational Therapy Education</td>
</tr>
<tr>
<td>AJOT</td>
<td>American Journal of Occupational Therapy</td>
</tr>
<tr>
<td>AOTA</td>
<td>American Occupational Therapy Association</td>
</tr>
<tr>
<td>CPL</td>
<td>Continued Professional Learning</td>
</tr>
<tr>
<td>GCM</td>
<td>Growth Curve Modeling</td>
</tr>
<tr>
<td>NBCOT</td>
<td>National Board for Certification of Occupational Therapy</td>
</tr>
<tr>
<td>OT</td>
<td>Occupational Therapist; Occupational Therapy</td>
</tr>
<tr>
<td>OTA</td>
<td>Occupational Therapist Assistant</td>
</tr>
</tbody>
</table>
Chapter One

Introduction

Occupational therapy (OT) is an allied health profession that helps people with disabilities, cognitive or physical, participate in their lives as independently as possible. An associate degree college education is required for the occupational therapy assistant (OTA) professionals who implement the plans outlined by an occupational therapist and provide skilled treatment activities with patients, and the educational programs are typically situated in community colleges or in a satellite campus of a university. The standards for OT educational programs are established by Accreditation Council for Occupational Therapy Education (ACOTE), which also evaluates these programs for compliance with those standards. As with most professional education programs, students are likely to be focused on getting through the program and getting a job in the OT field.

Occupational therapy practice continues to grow as the discipline addresses disability and wellness issues in society, and OT practitioners are encouraged to respond to client needs “quickly, creatively, and proactively” (AOTA, 2009, p.804). One statement in the preamble of the ACOTE standards is for educational programs to help a student “be prepared to be a lifelong learner and keep current with the best practice” (ACOTE, 2011, p. 2), which is associated with a self-referenced view of learning and competence (Nicholls, 1984). Students with a self-evaluative mindset are likely to engage in learning for the opportunity to connect current educational processes with past and subsequent learning (Pintrich, Marx, & Boyle, 1993).

At the same time, there is an ACOTE standard for the OT educational program to maintain accreditation by having an 80% first-attempt pass rate by its students on the
certification exam administered by the National Board for Certification in Occupational Therapy (NBCOT). The exam uses test items that describe actual practice scenarios that require integrated and comprehensive knowledge to answer correctly. Students who are focused on incorporating past learning and new knowledge are more likely to be successful in passing the exam. Other students may be concerned only about getting high grades in class and learning enough facts to pass the exam for entry to practice (Elliot, McGregor, & Gable, 1999). These students are less likely to focus on learning that can be generalized to many settings and new paradigms (Ames & Archer, 1988; Thomas & Qiu, 2011).

Research has shown that the instructional practices in the classroom affect students’ learning goals and practices (Ames, 1992; Retelsdorf & Günther, 2011) and possibly could influence their use of effective cognitive learning strategies and plans for continued learning after graduation (Senko & Harackiewicz, 2005a; Torraco, 2008). The instructional practices inform students about the teacher’s definition of academic success in the classroom (Kumar & Maehr, 2007). Students who are encouraged to focus on intrapersonal learning are more likely to use strategies that integrate prior knowledge with current and new learning and use more self-guided plans to continue learning (Meece, Anderman & Anderman, 2006). Instructional activities that publicly acknowledge the positive or negative performances of students have been shown to facilitate memorization strategy use and interpersonal comparisons for students (Kumar & Maehr, 2007).

An interpersonal orientation that helps students achieve high grades can be valuable in the competitive process for admission to the OTA program. Auriemma (2002,
2007) noted that admissions committees for OT programs, and likely the same for OTA programs, would typically consider several factors when reviewing applications of potential students including prior academic achievement, the ability to articulate goals for admission to and completion of the program, and experiential awareness of OT practice. However, if educational programs receive many applications for limited admission spaces (e.g., in 2011 to 2012 an OTA program in Michigan received an average of 200 to 250 applicants for 35 yearly admission spots (P. Clements, personal communication, November 12, 2012)), admission committees often begin the evaluation process by prioritizing the applications with the highest reported grade point average (Harackiewicz, Barron, Tauer, & Elliot, 2002; Schmalz, Rahr, & Allen, 1990). After the start of classes an admitted student who fails or drops out of the program would not be replaced by a new student since the OTA program curriculum is designed for each cohort group to follow a preset curriculum in which each semester provides a base for the following semesters. Further, the higher grade point average on an application might not be an indication of a student’s motivation to learn for self-fulfillment, for the benefit of the profession, or for integration of new knowledge with prior learning, all of which are expected from OTA applicants and important for effective practice and continued learning after graduation.

An OTA instructor may introduce an ethos of acquiring knowledge for the benefit of self, the profession, and one’s clients in an introduction to OT class often offered in the first semester after admission. In that course, students are acquainted with continuing competency documents by the American Occupational Therapy Association (AOTA), one of which outlines standards for practitioners to develop knowledge for the best
practice of OT (AOTA, 2010). Education after graduation or continued professional learning (CPL) has become an important and necessary aspect for good practice in many professions, including OT (Daley, 2001; Jones & Kirkland, 1984). According to Webster-Wright (2009), through CPL “professionals learn, in a way that shapes their practice, from a diverse range of activities, from formal PD [professional development] programs, through interaction with work colleagues, to experiences outside work, in differing combinations and permutations of experiences” (p. 705). After introduction to the AOTA document of continuing competence standards, OTA students who are focused on increasing their knowledge for self-benefit and the benefit of effective practice may increase their plans for using multiple options for CPL even beyond what is required for licensed practice, while students who are focused on doing what is minimally required to pass may plan only for a minimal amount of CPL after graduation.

The competitive nature of the OTA program admission process, with its focus initially on grade point average, conflicts with the program standards to develop lifelong learners who challenge themselves to learn for the benefit of self and clients in school and after graduation. The motivational goals for learning in the moment and in the future can be influenced by the instructional practices in a classroom situation, and achievement goal theory is a motivational lens that can be used to examine students’ goals and the cognitive learning strategies they use for learning. The theoretical framework of the study is examined in the next section.

Theoretical Framework of the Study

Achievement goal theorists examine the social-cognitive reasons or underlying motivations for students’ achievement oriented behaviors in the classroom (Ames &
John Nicholls (1984), one of the first achievement goal theorists, defined achievement behavior “as behavior directed at developing or demonstrating high rather than low ability” (p. 328). Nicholls also noted that students exhibited learning behaviors and motives to reach some goal or reward, generally described as mastery and performance goal orientations. Briefly, people who want to learn to increase their own knowledge or wish to challenge themselves in a learning task are described as having mastery goal orientations (Ames & Archer, 1988; Elliot & McGregor, 2001). Students who wish to show ability by comparison to others, through achieving good grades or by not appearing less able than others in the classroom, are described as having performance goal orientations (Barron & Harackiewicz, 2000; Elliot & McGregor, 2001). This study uses the two general mastery and performance goal orientations, though these goal orientations have been further divided into approach and avoid subsets in some studies (Elliot & McGregor, 2001; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). A brief description of these dimensions and the accompanying behaviors exhibited by students with these goal orientations follows in the next paragraphs.

Mastery goal orientations are described as intrapersonal and self-referenced assessments of achievement, with successful and competent accomplishment of a learning task as an end to itself (Elliot & McGregor, 2001; Nicholls, 1984). Students with mastery goal orientations have been found to have higher levels of interest in a subject, increased perseverance, cognitive engagement, and pursuit of additional study in a discipline (Elliot & McGregor, 2001; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997; Harackiewicz, Barron, Tauer, et al., 2002a; Pintrich & DeGroot, 1990). A mastery-
approach goal orientation is associated with learning for “skill development and self-improvement” (Van Yperen, 2006, p. 1433), along with effortful engagement in the classroom and deeper processing of the material to be learned (Elliot & McGregor, 2001). Reports of increased use of deep processing cognitive learning strategies such as integration of new material with prior learning and comprehension monitoring have been associated with a mastery goal orientation (Pintrich, McKeachie, & Lin, 1987). However, unlike students with other goal orientations, students with mastery-avoid goal orientations showed decreased performance on tasks, fear of failure in one’s self, and greater emotionality (Elliot & McGregor, 2001; Van Yperen, Elliot, & Anseel, 2009).

Performance goal orientations are associated with learning to show one’s ability by getting high grades in comparison to others and with demonstrating competence to avoid the appearance of inability or low ability (Ames, 1992; Nicholls, 1984). Students with performance goal orientations are focused on grades and comparisons with others, relying on public recognition of their accomplishments or pleasing the teacher (Meece et al., 1988). These students tend to engage in more surface cognitive learning strategies such as asking instructors how many facts they need to memorize to pass a test (Meece et al., 1988). Performance-approach goal orientations are associated with demonstrating knowledge through higher grades than others, and this can lead to strained relationships with peers in the classroom and actual loss of interest in a task (Van Yperen, 2006; Wolters, 1998). Students with performance-avoid goal orientations want to not appear less knowledgeable than others, and these students have shown greater anxiety and decreased concentration on a task (Ames & Archer, 1988; Elliot & McGregor, 2001; Van Yperen, 2006).
Both mastery and performance goal theorists have demonstrated how the instructional practices used in the classroom have some influence on students’ achievement goal adoption (Meece et al., 2006). Research indicates that students are more likely to assume mastery goal orientations for learning when teachers promoted classroom activities such as individual thinking assignments, small group activities, content mastery, a focus on criterion grading, and student self-improvement (Ames, 1992; Ames & Archer, 1988; Kumar & Maehr, 2007; Pintrich et al., 1993). In classrooms with performance instructional practices, teachers used normative grading and social comparison for evaluation, offered no choices to students for learning activities, and grouped students according to ability while limiting student interactions at the same time (Maehr & Midgley, 1991; Meece et al., 2006). While elementary teachers have more flexibility to provide a mastery goal focused environment, junior high and high school classrooms have been found to be more performance goal oriented (Maehr & Midgley, 1991). University classrooms have been found to be “predominantly performance oriented” (Harackiewicz, Barron, Tauer, et al., 2002, p. 571), particularly in larger lecture format classes. Students with a mastery goal orientation and interest in an introductory college class have been found to continue their choices for learning in the discipline of psychology seven semesters later (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008) and in engineering two semesters afterward (Lent et al., 2003). Given that professional educational programs in college such as those in OT and nursing have fewer large lecture-style classes, the smaller classes may permit use of more mastery instructional practices and influence their students’ achievement goals over time toward a stronger mastery goal orientation for learning.
Studies of students’ goal orientations and learning strategies have included students in some competitive-admission professional educational programs such as nursing and medicine, but these students were evaluated at a single point in time in large lecture and online class environments (Carroll & Garavalia, 2004; Lent et al., 2003; Salamonson, Everett, Koch, Wilson, & Davidson, 2009). OTA professional educational programs have smaller cohort classes which may allow the greater use of mastery instructional practices to encourage students with anticipated performance goal orientations and use of surface cognitive learning strategies at admission to adopt stronger personal mastery goal orientations and more deep processing cognitive learning strategies. The plans that students have for continued professional learning (CPL) after graduation may be related to personal goal orientations. Any increase in mastery goal orientations, deep processing cognitive learning strategies, and plans for CPL over time could be an indicator of meeting the ACOTE standard for educational programs to develop lifelong learners.

Statement of the Problem

While goal orientations and associated motivational and learning outcomes have been examined for elementary, middle, high school, and some college students, the goal orientations and consequent learning strategies of students after competitive admission to a professional educational program have not been examined. The highly competitive nature of the OTA program admission process may contribute to newly admitted students having more performance goal orientations for learning and using more surface cognitive learning strategies. Students with these goal orientations and learning strategies are less likely to be engaged and self-directed learners (Harackiewicz et al., 1997). This is in
conflict with ACOTE standards for OTA educational programs to develop lifelong learners who are more likely to have mastery goal orientations and a greater use of deep processing cognitive learning strategies.

Instructors who used mastery instructional practices in the classroom encouraged students to engage in challenging learning activities that facilitated self-reflection and intellectual growth (Kumar & Maehr, 2007). Barron and Harackiewicz (2000) found that the goals of students in smaller advanced psychology seminar classes were similar to the students in larger introductory classes, but the students in OTA programs engage in small discipline focused classes about occupational therapy immediately upon admission. However, instructors in professional educational programs may have limited training in student motivational goals for learning and the use of mastery instructional practices (Bondoc, 2005; Dempsey, 2007). Prior research about instructional practices in occupational therapy has generally described processes such as problem-based learning without identification of these as mastery or performance instructional practices (Bondoc, 2005; Hammel et al., 1999; Lawson, 2014; McNulty, Crowe, & VanLeit, 2004).

Though the OTA students complete their professional education programs with a generalist knowledge base for practice in physical rehabilitation and mental health areas (ACOTE, 2011; Coppard & Dickerson, 2007), the skilled practice of occupational therapy requires ongoing competence assessment and development (AOTA, 2010; Garrahy, Thibodaux, Hickman, & Caldwell, 1992; Jones & Kirkland, 1984). To acquaint students with a concept of learning after graduation, an introductory OT course is offered early in the curriculum to present the profession’s documents, including those about continued education, and acquaint students with the ever-broadening scope of OT
practice. However, Torraco (2008) found that few midlevel healthcare professionals, those with more than a high school degree but less than a bachelor’s degree for their discipline, could recall more than brief and general reminders from their instructors to keep up with advances in their profession and complete continuing education hours. The association of plans for continued professional learning and one’s personal goal orientation has been examined in prior studies only within the context of participation in advanced courses in a discipline during college enrollment (Harackiewicz, Barron, Tauer, et al., 2002; Lent et al., 2003). OTA students with performance goal orientations may be more likely to consider participating in minimum requirements of the workplace and that which is needed to maintain their state professional licenses. Students with a mastery goal orientation may be more likely to seek multiple and more self-guided activities for learning such as reading journals or learning from coworkers. Research could show a link between students’ plans for continued professional learning after graduation and personal goal – mastery and performance – orientations.

In summary, OTA instructors may have little education in pedagogy and therefore have not had the opportunity to reflect on or consider the effect of their instructional practices on students’ motivations in the classroom. The competitive nature of the admissions process for OTA applicants, with the heavy emphasis on grade point average for review of applications, indicates that students may enter the educational program with a performance goal orientation, but no studies to date have examined OTA students’ mastery and performance goal orientations and the cognitive learning strategies they use at the start of the OTA educational program nor any changes that may occur in the first year of the program. Though continued professional learning is important for effective
practice as an OTA and may be associated with a personal mastery goal orientation, no study has examined the relationship between personal goal – performance and mastery – orientation and the number of plans a student has for CPL after graduation.

**Purpose of the Study**

One purpose of this study was to explore the personal mastery and performance goal orientations and the surface and deep processing cognitive learning strategies used by OTA students subsequent to gaining admittance after participating in a highly competitive admission process. A second purpose was to examine the mastery and performance instructional practices of instructors in an introductory OT class and any relationship of those practices to changes in students’ mastery and performance goal orientations at the end of this class and in the following semester. The study also examined the number of plans students have for continued professional learning (CPL) at the end of the introductory class and in the next semester. A final purpose was to examine any changes in the students’ personal goal – mastery and performance – orientations, use of surface and deep processing cognitive learning strategies, and plans for CPL after participation in the introductory OT class and in the next semester.

**Significance of the Study**

This study contributes to evidence about the impact of instructional practices on students’ personal goal – mastery and performance – orientations and cognitive learning strategy use after those students have participated in a highly competitive admission to OTA programs. The study provides an assessment of the relationship of professional program students’ mastery and performance goal orientations and plans for continued professional learning after graduation. The study also contributes to the knowledge base
for OTA education program developers regarding the positive value of engaging in mastery instructional practices and the problems associated with performance instructional practices on their students’ learning and motivation.

**Research Questions**

The following research questions (RQ) guided the data collection:

RQ1. Do introductory OT class instructors use more mastery or more performance instructional practices in the class?

RQ2. Do students have more performance and less mastery goal orientations at the beginning of the introductory OT class?

RQ3. Do OTA students use more surface and less deep processing cognitive learning strategies at the beginning of the class?

RQ4. Are there changes in personal goal – mastery and performance – orientations of students after participating in the introductory class?

4a. Are any changes sustained or increased in the next semester?

RQ5. Are there changes in the use of surface and deep processing cognitive learning strategies after participating in the introductory class?

5a. Are any changes sustained or increased in the next semester?

RQ6. What is the number of plans for continued professional learning (CPL) at the beginning of OTA educational program?

6a. Does the number of CPL plans increase after participation in an introductory OT class?
6b. Does the number of CPL plans remain sustained or increased in the next semester?

RQ7. Are any changes in students’ reported use of cognitive – surface and deep processing – learning strategies from Time 1 to Time 2 to Time 3 associated with changes in their mastery and performance goal orientations?

RQ8. Are any changes in students’ mastery and performance goal orientations associated with changes in the number of plans for CPL from Time 1 to Time 2 to Time 3?

RQ9. Is the use of mastery and performance instructional practices in the introductory OT class associated with changes in students’ personal goal – mastery and performance - orientations from Time 1 to Time 2 to Time 3?

Research Hypotheses

This study evaluated data gathered from instructors and first-year OTA students to assess the instructional practices in an introductory class and students’ personal mastery and performance goal orientations, reported surface and deep learning strategy use, and CPL plans. The study also evaluated changes in students’ personal goal orientations, cognitive learning strategies used, and plans for CPL. The following research hypotheses (RH) guided the study:

RH1. Instructors are likely to use more performance and less mastery instructional practices in the introductory OT class because instructors tend to emphasize grades (Crist, 1999; Dempsey, 2007).
RH2. OTA students are likely to have more performance and less mastery goal orientations at the beginning of the introductory OT class because of having participated in a highly competitive admission process.

RH3. Students are likely to use more surface and less deep processing cognitive learning strategies at the beginning of the class.

RH4. Students are likely to have more performance and less mastery personal goal orientations after participation in the class than at the beginning of the class.

4a. Students are likely to have sustained or increased performance goal orientations and decreased mastery goal orientations in the next semester.

RH5. Students are likely to use more surface and less deep processing cognitive learning strategies after participation in the class than at the beginning of the class.

5a. Students are likely to have sustained or increased surface cognitive learning strategies and decreased deep processing cognitive learning strategies in the next semester.

RH6. Students are likely to have a low number of plans for continued professional learning at the start of the OTA program due to unfamiliarity with the CPL requirements and ethos of the profession.

6a. Students will have a greater number of plans for continued professional learning (CPL) after participation in an introductory OT class which introduces professional requirements and ethos for CPL.

6b. Students are likely to have a sustained or increased number of CPL plans in the next semester.
RH7. Increased deep processing and decreased surface cognitive learning strategy use will be associated with an increase in personal mastery goal orientation over time. Increased surface and decreased deep processing cognitive learning strategy use will be associated with an increase in personal performance goal orientation over time.

RH8. Increased mastery goal orientations over time will be associated with an increased number of CPL plans over time. Increased performance goal orientations over time will be associated with a decreased number of CPL plans over time.

RH9. The use of more mastery and less performance instructional practices will be associated with students’ increased mastery and decreased performance goal orientations over time. The use of more performance and less mastery instructional practices will be associated with students’ increased performance and decreased mastery goal orientations over time.

Study Design

Given the nature of the research questions and hypotheses, a longitudinal research design was used for this study. Surveys were used to gather information from first-year OTA students at three time points – near the beginning of the introductory OT class and near the last week of the class, and near the beginning of the next semester. The student survey included items to assess mastery and performance goal orientations for learning, use of surface and deep processing cognitive learning strategies, and plans for CPL. The instructors for the introductory OT class were surveyed two times, near the beginning and end of the course. The instructor surveys included items to assess the mastery and performance instructional practices. The directors of the participating OTA programs were asked about typical student application and admission numbers to validate the
competitive nature of admission to the program. Analysis of the data is described in Chapter Three.

**Definition of Key Terms**

For the purpose of this research, the following definitions were used:

*OTA educational program*

An ACOTE–accredited educational program for occupational therapy assistants in the United States. For this study, the program must offer students an introductory Occupational Therapy class in the first semester after admission to the OTA program.

*First-year OTA student*

A student who is enrolled and participating in occupational therapy assistant (OTA) classes in the first two semesters after admission to the OTA program.

*Personal mastery goal orientation*

A concept used to describe the motivation a student employs to pursue a learning goal such as to increase personal knowledge or be challenged to learn something new. The focus of learning with a mastery goal orientation is to intrapersonally improve one’s knowledge.

*Personal performance goal orientation*

A concept used to describe the motivation a student employs to pursue learning, for example to get a higher grade than peers or be acknowledged for one’s ability. The focus of learning with a performance goal orientation is to demonstrate ability interpersonally or in comparison to others.
Deep processing cognitive learning strategies

Learning strategies to maintain attention, facilitate learning, monitor learning, and integrate new learning with prior learning (Dunn, Lo, Mulvenon, & Sutcliffe, 2012). Some examples include elaboration, concept mapping, and critical thinking about a reading assignment.

Surface cognitive learning strategies

Learning strategies that are used for learning new material such as rote memorization of definitions and seeking a quick answer from a peer or teacher.

Continued professional learning (CPL)

Educational activities that are undertaken after graduation and certification as a professional to maintain best practices in the field of study. Such activities may include participation in work inservices, professional conferences, learning from colleagues, and reading professional journals (NBCOT, 2013; Webster-Wright, 2009).

Mastery instructional practices

A constellation of activities in the classroom used to engage students in effortful learning, self-improvement, and engagement in challenging activities (Kumar & Maehr, 2007). Mastery activities may include small group discussions, critical thinking written assignments, and group problem solving.

Performance instructional practices

A constellation of activities in the classroom used to impart knowledge to students and to emphasize student performance relative to others (Kumar & Maehr, 2007). Such
activities may include posting a student’s work as an example and using lectures to convey knowledge.

**Delimitations and Limitations**

**Delimitations**

This study included only OTA students who have been admitted to and enrolled in an introductory occupational therapy class in their first academic period in an ACOTE-accredited occupational therapy assistant educational program. The OTA programs were recruited from Michigan, Ohio, and Pennsylvania. These students were fairly representative of the OTA student population at the time of the study.

The study included longitudinal assessment of the OTA students’ achievement goal orientations, cognitive learning strategy use, and CPL plans at three points during the first two academic periods after admission. The study did not include assessments of those students prior to admission or after graduation. The study relied on students who were in attendance in the introductory class and willing to participate when the assessment instruments were distributed; students who dropped out after the study was initiated were not included in all assessment points. The study relied on the contact person at each institution to encourage students to participate, distribute the surveys, and collect responses from the students in a timely manner.

Further, the study involved only the instructors in OTA educational programs who were teaching the introductory class. Some of these instructors may be full-time faculty for the OTA program, and some instructors may be adjunct faculty. There were no
requirements for the instructors in terms of their own prior educational training or
teaching experience.

**Limitations**

The regional nature of the OTA educational programs included in the study may
limit generalization of findings to the entire population of OTA programs. In some areas,
former graduates may become instructors in the same OTA program, which may further
limit innovations in instructional practices. The instructional practices used in the classes
were limited to what the instructors chose to use, and the methods may not be consistent
across OTA programs. Some instructors may have years of teaching experience with the
introductory class and may be resistive to changing instructional methodology, even if
the evidence of the study demonstrated that some practices are more effective in
developing students with a more mastery goal orientation.

Another limitation in assessment of students’ goal orientations, cognitive learning
strategies, and plans for continued professional learning was the exclusion of a number of
OTA students. Many OTA students may have been excluded from the study because they
took an introductory OT class before admission to an OTA program or after the first
academic period of the OTA curriculum. Not all students who take an introductory class
that is offered before application to an OTA program complete the admission process.
Those students who do complete the admission process and take the introductory class
after the first semester have a unique experience of having more classes together than
students that begin OT classes only in their first semester in a program. The cohort
experience of students admitted to an educational program and who took several courses
together has been shown to affect the goal orientations of students (Eren, 2009). In
addition, the exclusion of students taking the introductory class in the first semester who were absent when the study surveys were distributed or who chose to not participate in the study may skew the results.

Further, the study included only two academic periods after admission to the OTA program and does not follow the students after that time period. There were no guarantees that any changes in achievement goal orientation, learning strategy use, or CPL plans would remain the same after the period of the study. There may have been unobserved changes in personal goal orientations, cognitive learning strategies, and CPL plans occurring outside the scope of this study through participation in classes other than the introductory class, in the time after the first two academic periods of OTA classes, or through events or classes prior to admission. In addition, changes may not occur until after students have graduated from the OTA program and begun clinical practice.

While this study assessed the achievement goal orientations, cognitive learning strategy use, and CPL plans of associate degree students in several OTA educational programs, the findings may not be generalizable to other competitive-admission associate degree programs such as those for physical therapy assistants or medical assistants. In addition, the findings with the associate-degree OTA students may not be comparable to those of OT students in graduate degree professional programs. All of these programs have requirements for admission, academic activities, and clinical skills that differ from those for OTA students.

**Overview of Upcoming Chapters**

Chapter Two provides an overview of the existing research about achievement goal theory, mastery goal orientations, and performance goal orientations. These learning
goal orientations are associated with the use of deep and surface cognitive learning strategies. A review of continued professional learning research is also included, along with an overview of OT education.

Chapter Three includes the research methodology for the study. There are descriptions of the specific information collected in surveys of the directors, instructors, and students in the OTA programs. Planned data analyses are described for the research data.

Chapter Four is a presentation of the analyses of the data from the participants and the results. Chapter Five includes the findings, conclusions, and implications of the study.

**Summary**

Achievement goal theorists have found that students engage in learning using mastery and performance goal orientations. Students with a mastery goal orientation choose to learn for the sake of learning, enjoy the process of learning, and often tend to use more deep processing cognitive learning strategies. Students with a performance goal orientation focus on learning to get a grade or complete a required activity and use more surface cognitive learning strategies. These goal orientations and cognitive learning strategies affect how students approach and integrate new knowledge with prior experience and education. While students with mastery goal orientations have been shown to continue in advanced courses in a discipline during college, a relationship between plans for continued professional learning and a mastery goal orientation has not been evaluated to date.
Occupational therapy assistant (OTA) educational programs have a highly competitive admissions process, and admission committees with a large number of applicants often focus on prior educational grade point average which may benefit students with a performance goal orientation. However, a stated accreditation standard for OT educational programs is the development of lifelong learners who will continue their education after graduation which is aligned more closely with students with a mastery goal orientation. OTA educators may not have training in pedagogy and motivational theories to guide their use of the instructional practices which impact students’ adoption of goal orientations, cognitive learning strategies, and potentially their plans for continued professional learning.

In summary, the impact of the highly competitive OTA program admission process on students’ goal orientations and cognitive learning strategies use has not been examined to date. A longitudinal study may identify a relationship between the instructional practices used in an introductory OT class and post-admission changes in OTA students’ achievement goal orientations and use of cognitive learning strategies. In addition, increases in students’ plans for continued professional learning and mastery goal orientations over time may be identifiers of meeting a standard to develop lifelong learners. Thus, these findings would contribute to the knowledge base for achievement goal theorists about the impact of a competitive admission process on students’ goal orientations and to the knowledge of OTA program developers as they consider instructional practices and students’ achievement goal orientations, cognitive learning strategy use, and plans for continued professional learning.
Chapter Two

Review of Literature

Participation in formal educational activities was once completely adult-imposed and primarily only within the scope of economic privilege. Children of the wealthy were schooled by parents and teachers in early Greek and Roman societies, using rote instruction for young children and more philosophical thinking for older children who showed a propensity for learning. Rote learning was still prevalent as a middle class developed and allowed more children to participate in educational classrooms. The intellectual pursuit of personal choice continued to be restricted to higher education for the wealthy and privileged few. As more children and young adults were incorporated in the classroom, teachers sought to understand the motivation of students for learning (Dewey, 1902).

In the early twentieth century, some educators began to focus on the concept that even young children could make choices and have their own motivations for learning. Dewey (1902) proposed that children could develop an interest in subjects and learn more fully by being active learners. Vygotsky (1978) wrote about the influence of language on learning and about social influences on the development of higher thought processes. The cultural influence for learning tasks such as in professional apprenticeship has also been linked to motivation for learning (Brown, Collins, & Duguid, 1989). Early theorists believed that motivation was almost solely the result of the personality traits or innate ability of the child such as noted by Moulton (1965). Later socio-cognitive theorists investigated how the cultural and situational aspects of the learning task could influence the child’s adaptive and maladaptive motivation (Dweck, 1986; Maehr, 1974; Nicholls,
Achievement goal theorists have shown how the social influences of the classroom such as the teacher’s instructional practices and evalulative methods impact the child’s cognitive motivation to achieve a goal (Dweck & Leggett, 1988; Urdan & Maehr, 1995). A named goal of many high school students, the acquisition of a well-paying job or career, often includes completion of a college degree. The pursuit of a career in a specific discipline such as occupational therapy, and for advanced learning within that discipline after graduation, may be explained through the lens of the achievement goal theory of motivation.

**Achievement Goal Theory**

Achievement goal theory uses a social-cognitive framework to explain the motivations for learning and associated behaviors. Maehr (1974) noted that earlier motivation theory was focused on “learned inner drives and culturally derived personality patterns” (p. 887) that could be changed only within the individual child, with little understanding on how the situation affected achievement. He further advocated that the individual’s personality and situation interact, within a cultural environment, to affect motivation. Briefly, the two primary goals for learning were mastery and performance, with the process of learning being most important to those with mastery goals and the products or status of learning being most important to persons with performance goals. After establishing the two general goals for learning, investigators determined that certain learning strategies were associated with those goals. The situation for learning was emphasized as a crucial catalyst for encouraging adoption of goal orientations, and researchers began investigating the effects of situation on motivation. While the performance and mastery goal of approach and avoid valences are described in the
literature, this study used generic mastery and performance goal orientation identifiers.
The next sections more fully describe the goal orientations, associated learning strategies, and the instructional methods that support the use of mastery and performance goals.

Performance Goal Orientation

Students were described as performance-focused when their goals were to show that they performed better than their classmates, demonstrated competence or superior ability, or avoided appearing unable relative to peers (Ames & Archer, 1988; Barron & Harackiewicz, 2003; Dweck, 1986; Elliot, 1999; Elliott & Dweck, 1988; Elliot & McGregor, 2001; Harackiewicz, Barron, Pintrich, et al., 2002; McWhaw & Abrami, 2001; Wolters, Yu, & Pintrich, 1996). The visibility of the products of learning, for example grades and rewards, is more important than the process of learning (Ames, 1992). Performance goals have been further delineated as performance-approach, achievement to demonstrate competency in relation to that of others, and performance-avoid, achievement to avoid any perception of failure when compared to others.

Performance-approach goals predicted engagement in the classroom and higher final grades in some college classes (Barron & Harackiewicz, 2003; Dinger, Dickhäuser, Spinath, & Steinmayr, 2013; Dishon-Berkovits, 2014; Harackiewicz, Barron, Tauer, et al., 2002; Lau & Nie, 2008; Senko & Hulleman, 2013). The engagement of students and persistence toward an accomplishment, especially when the task is perceived to be difficult, has been noted when students had performance-approach goals (Agbuga, 2011; Lau & Nie, 2008; Phan, 2011; Senko & Hulleman, 2013; Sultan & Hussain, 2012). Significant relationships between the initial use of performance-approach goals and a
later adoption of mastery goals have been noted, with an implication that engagement and success in a task contributed to a further interest and increased effort to pursue learning in the subject (Phan, 2011; Senko & Hulleman, 2013).

Students with a performance-avoid goal demonstrated disorganization, decreased interest in the actual material to be learned, decreased effort expended, and lower grades throughout college careers (Barron & Harackiewicz, 2001; Dinger et al., 2013; Harackiewicz et al., 2002; Kolić-Vehovec, Rončević, & Bajšanski, 2008; Senko & Harackiewicz, 2005a; Sultan & Hussain, 2012). They were “focused on performing tasks as soon as possible with minimal effort” (Kolić-Vehovec et al., 2008, p. 109). This goal orientation is also associated with decreased persistence on a task and weakly with poor classroom attention (Lau, Liem, & Nie, 2008; Sideridis & Kaplan, 2011).

When students with performance goals felt that their academic ability was lower than that of peers, they associated any academic failure as directly attributed to their lack of mental ability and not to a lack of effort on their part (Akin, 2010; Ames & Archer, 1988; Dweck, 1986). Further, students who perceived themselves as having less capability than others were shown to have improved outcomes in performance-oriented situations when told that they had a greater capability than the students themselves believed (Nicholls, 1984). In another study, students who believed they had less mental capability also believed that learning required great effort, sometimes more than was actually needed for the task (Dweck & Leggett, 1988). Other students attributed a poor academic performance to factors outside themselves such as a belief that the circumstance of the classroom was not appropriate for their learning needs or that the teacher did not like certain students like themselves (Akin, 2010; Elliott & Dweck, 1988).
While many studies differentiated the behaviors and attitudes of students with performance-approach and performance-avoid goals, Linnenbrink-Garcia et al. (2012) evaluated more than 50 studies conducted in academic settings and found moderate to strong correlations between performance-approach and performance-avoid goals. The authors noted that “the mastery-performance distinction may be more relevant than the approach-avoidance distinction, especially in understanding how classroom contexts shape goal orientations” (Linnenbrink-Garcia et al., 2012, pp. 297-298).

**Mastery Goal Orientation**

Students who used learning as a means for self-improvement, who challenged themselves for the sake of learning, or who enjoyed the learning process were described as being mastery- or learning-focused (Dinger et al., 2013; Dweck & Leggett, 1988; Harackiewicz, Barron, Pintrich, et al., 2002; Meece et al., 1988). Mastery goals have been treated in the research literature mostly as a single concept, though the goal has also been bifurcated into mastery approach and mastery avoid goals (Elliot, 1999; Elliot & McGregor, 2001; Van Yperen, 2006; Van Yperen et al., 2009).

Students with a mastery approach goal orientation thrive on the process of learning, the challenge of problem-solving, and learning something new, even if the students knew or felt like they might not be fully successful on a task (Ames, 1984; Barron & Harackiewicz, 2000; Dweck, 1986; Dweck & Leggett, 1988; Ertmer et al., 1996; Jacobson & Harris, 2008; Justice & Dornan, 2001; McWhaw & Abrami, 2001; Sultan & Hussain, 2012). These students were found to be willing to take risks and made an effort to learn, and they demonstrated stronger interest by the pursuit of additional
learning within a discipline (Agbuga, 2011; Dweck & Legget, 1988; Harackiewicz et al., 1997; Harackiewicz et al., 2008; Lau & Nie, 2008; Meece et al., 1988; Pintrich, 2000; Sideridis & Kaplan, 2011). Students with mastery goals looked within themselves to determine whether they were improving in knowledge and had the necessary ability to pursue more knowledge (Agbuga, 2011; Akin, 2010; Barron & Harackiewicz, 2000; Jacobson & Harris, 2008; Senko & Harackiewicz, 2005b). Students who valued a task were more likely to have a mastery approach goal (Lau et al., 2008).

A mastery avoid goal is described as trying to do better than one has in the past, and this goal was linked to trying to learn so much material that the learning becomes disorganized and necessary concepts are lost in the shuffle (Elliot & McGregor, 2001; Kadioglu & Uzuntiryaki-Kondakci, 2014; Van Yperen et al., 2009). Students with this goal were noted to have decreased classroom attentiveness and group participation (Lau et al., 2008). Mastery avoid goals have been demonstrated to be less effective than all the other learning goal approaches (Van Yperen et al., 2009), and Elliot and McGregor (2001) found that students with mastery avoid goals adopted one of the other learning goals as a result of prior poor classroom performance. However, there is a controversy regarding mastery-avoid goals as some scholars (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010) argued that the negative valence associated with a mastery-avoid goal is not compatible with mastery goal orientations, which are approach oriented by definition. All of these goal orientations for learning are associated with cognitive learning strategies, and the strategies typically used by students with mastery and performance goal orientations are described in the next section.
Cognitive Learning Strategies Associated with Performance and Mastery Goal Orientations

Cognitive learning strategies are the thoughtful activities used by students to manage their cognitive, behavioral, contextual, and motivational resources for learning (Pintrich, 2004; Sitzmann & Ely, 2011; Zimmerman, 2002). They help students input knowledge about a subject, retrieve the information, and integrate the new knowledge with prior and future learning (Pintrich et al., 1987). The use of cognitive learning strategies has been delineated in self-regulated learning theory. There are four assumptions in self-regulated learning theory that apply to learning goals and strategies: (a) learning is an active and constructive process; (b) the learner has an ability to assume control of personal behaviors, learning, and some aspects of the environment; (c) students can set or accept a goal or criterion for learning achievement; and (d) “individuals’ self-regulation of their cognition, motivation, and behavior … mediate[s] the relations between the person, context, and eventual achievements” (Pintrich, 2004, p. 388).

Cognitive learning strategies include surface and deep processing strategies (Elliot et al., 1999).

Surface cognitive learning strategies include memorization and rote repetition of facts and figures, often called rehearsal, versus relating the meaning of the material to past learning to recall the material (Elliot & McGregor, 2001; Elliot et al., 1999; Kadioglu & Uzuntiryaki-Kondakci, 2014; McWhaw & Abrami, 2011; Meece et al., 1988; Wolters et al., 1996). Elliot, McGregor, and Gable (1999) also identified repetitive reading of texts and notes as a surface cognitive learning strategy. These strategies
encode the information but do not connect the current learning with past learning or future use potential (Kadioglu & Uzuntiryaki-Kondakci, 2014).

Students with performance goal orientations have been found to use more surface cognitive learning strategies. These students were found to be less open to challenging situations, acted more habitually or impulsively, and relied on feedback that was oriented to their rank among other students on their academic work (Ertmer et al., 1996; Retelsdorf & Günther, 2011). Meece, Blumenfeld, and Hoyle (1988) noted that elementary students who exhibited a performance goal orientation for learning also used effort reducing activities such as guessing answers, copying peers’ work, and frequently asking others for help. McCombs (2001) noted that these surface cognitive learning strategies “may cause frustration and lead to premature withdrawal from the learning process” (p. 102), which could contribute to early withdrawal from a rigorous professional educational program.

While surface cognitive learning strategies can be helpful in the pursuit of a good grade or in getting the minimally required work accomplished, deep processing cognitive learning strategies have been found to be more effective in the college environment which is more independently directed than that in high school (Pintrich, 2004; Pintrich, Smith, Garcia, & McKeachie, 1993; VanderStoep, Pintrich, & Fagerlin, 1996; Wolters, 1999; Zimmerman, 2002). Deep processing cognitive learning strategies include reading to discern meaning from a text, note-taking for integrating concepts with past knowledge, planning and using an effective learning environment, and self-disciplinary processes to maintain an adequate mental attention for study (Elliot et al., 1999; Pintrich et al., 1987; Zimmerman, 2002). Time management, regulation of the study environment, and
monitoring of learning are strategies that help students align their learning with their goals (Pintrich, 1999). Deep processing cognitive learning strategies have been linked to better understanding of the subject material, greater competence in using the knowledge, and longer term retention of the material (Elliot & McGregor, 2001; Elliot et al., 1999). Mental and psychological efforts are needed by students to plan, use, review, and modify these strategies (Wolters, 1998, 2003; Zimmerman, 2002). In a meta-analysis of such learning strategies, Sitzmann and Ely (2011) found that “goal level, persistence, effort and self-efficacy…accounted for 17% of the variance in learning after controlling for cognitive ability and pretraining knowledge” (p. 438).

Students with mastery goal orientations showed increased knowledge about and use of deep processing cognitive learning strategies for their pursuit of learning in the classroom and in online computer learning environments (Barnard-Brak, Lan, & Paton, 2010; Boekaerts, 1997; Pintrich, 2004; Sultan & Hussain, 20012). Mastery goal learners used greater persistence on a task and metacognitive skills to go beyond learning what was on the page in the textbook and in the professor’s lecture words (Ames & Archer, 1988; Elliot & McGregor, 2001; Ertmer et al., 1996; Kadioglu & Uzuntiryaki-Kondakci, 2014; Pintrich et al., 1993; Sansone et al., 1999; Wolters, 1998; Wolters et al., 1996). Students with mastery goal orientations demonstrated “higher levels of efficacy, task value, interest, positive affect, effort and persistence, [and] the use of more cognitive and metacognitive strategies” (Pintrich, 2000, p. 544). They integrated new ideas into previous experiences and knowledge, were more open to new challenges, and sought to find creative connections with anticipated interactions between personal experience and new ideas (Duncan & McKeachie, 2005; Ertmer et al., 1996; Pintrich & DeGroot, 1990).
These students were willing to use effort to organize the learning material, to establish an effective study environment, and to review the outcomes and plan necessary changes to increase their own competence for learning (Wolters, 1998, 2003). Mastery goal oriented students, as described in a study by Wolters (2003), were also less likely to procrastinate.

While teachers may have felt that college students with mastery goal orientations were the most desirable and easy to teach in the classroom, because the students needed guidance but not a teacher-directed push toward learning, Barron and Harackiewicz (2000) noted that “no one goal proved optimal for all participants” (p. 251). However, students can be challenged and supported through instructional methods to develop effective learning skills and to maximize a successful educational outcome (Kistner et al., 2010; Pintrich, 2003; Pintrich & DeGroot, 1990; Pintrich et al., 1993; Royeen, 1995; Sansone, Sachau, & Weir, 1989), which is described in the next section.

**Instructional Practices and Students’ Achievement Goal Orientations**

Achievement goal theorists extended their studies to the instructional practices demonstrated by teachers in the classroom and school (Ames; 1984, 1992; Ames & Archer, 1988; Kaplan & Midgley, 1997; Maehr & Anderman, 1993; Maehr & Midgley, 1991). Early studies investigated the effects of assigning participants to a context to pursue specific goals in environments which were indicative of different conceptions of school success and reasons for engaging in academic activity (Ames, 1984; Elliot & Harackiewicz, 1996; Elliott & Dweck, 1988). Ames (1984) found that, based on the assigned motivational climate of the learning situation, students identified the following
attributes about themselves: (a) they focused on ability in competitive situations, and (b) effort was needed to learn in individualized settings.

While a student comes into the classroom with his or her own individual goal orientations based on prior experiences, more recent studies showed that the student’s perceptions of the current classroom environment interacted with and influenced the student’s goal orientation (Meece et al., 2006; Negru & Damian, 2010; Retelsdorf et al., 2010; Urdan & Schoenfelder, 2006). Students were attuned to what constituted academic success in the classroom or school, and classroom situations frequently have been found to be more performance-oriented as students left elementary school and moved into junior and senior high school (Maehr & Anderman, 1993). The college environment has been identified as particularly conducive to a performance goal orientation, with recognition and celebrated awards for high grade point averages and scholarship (Harackiewicz, Barron, Pintrich, et al., 2002; Meece et al., 1988; Schumacker & Sayler, 1995). The motivational climate in the classroom is swayed by the instructor’s instructional practices as described in this section.

Instructors have personal mastery and performance goal orientations, which influenced their instructional practices used (Butler & Shibaz, 2008; Hmelo-Silver, Duncan, & Chinn, 2007; Negru & Damian, 2010; Retelsdorf, Butler, Streblow, & Schiefele, 2010; Retelsdorf & Günther, 2011; Urdan & Schoenfelder, 2006; Wolters, Fan, & Daugherty, 2011). Shim, Cho, and Cassady (2013) found that teachers’ mastery goal orientations led to the use of mastery instructional methods and performance-approach goal orientations contributed to use of performance instructional methods, while performance-avoid goal orientations did not lead to distinguishable instructional practices.
in the study. Teachers in some subject areas such as language arts were more likely to use mastery instructional practices in the classroom than teachers in math or science classes (Wolters et al., 2011). Elementary and junior high teachers discovered in a collaborative research study that, as the teachers began to be more task-oriented and less ability-focused in the classroom, students in those same classrooms were more engaged in and demonstrated greater control of their own learning (Ames & Archer, 1988; Butler & Shibaz, 2008; Maehr & Anderman, 1993; Maehr & Midgley, 1991; Retelsdorf & Günther, 2011; Urdan & Midgley, 2003). However, Negru and Damian (2010) reported that performance goal orientations in students were also found in classrooms with a mastery instructional practices, an indication that the environment influences but does not absolutely control a student’s adoption of a goal orientation.

Several studies have found that the instructional practices in the classroom environment can enhance mastery and performance goals in students (Ames, 1992; Ames & Archer, 1988; Diaz, Neal, & Amaya-Williams, 1990; Kumar & Maehr, 2007; Ogawa, 2011; Schunk, 2001; Shim, Cho, & Cassady, 2013; Urdan & Schoenfelder, 2006). Competitive classroom situations such as those with grading on a normative curve contributed to students focusing on their perceived ability as the reason for success or failure on a task, which is associated with a performance goal orientation (Ames, 1984; Ames, 1992; Harackiewicz et al., 1997). Teachers who themselves were mastery goal oriented have been found to encourage questioning from students (Butler & Shibaz, 2008). Small group collaborative and cooperative learning activities were shown to be effective for mastery goal oriented learning, even when the students received guidance from the instructor, and especially when the process created a sense of autonomy in the
students (Ames, 1992; Deci, Eghrari, Patrick, & Leone, 1994; Garcia & Pintrich, 1996; Jang, 2008; Law, 2011; Meece et al., 1988; Neistadt, 1999; Nolinske & Millis, 1999; Seruya, 2007). In more individualized classroom situations such as in a seminar class with fewer students and an opportunity for group interaction to explore ideas, students were more focused on their personal efforts and had a stronger mastery goal orientation (Ames, 1984; Barron & Harackiewicz, 2003; Maehr & Anderman, 1993).

The cohort environment in college professional programs, when a group of students take many classes together over time, has been shown to influence goal orientation (Hmelo-Silver et al., 2007). Urdan (1997) reported similar findings among adolescent students. Richardson (2010) found that the student cohorts of occupational therapy students at seven Danish OT programs had significant differences in approaches to studying as compared to between students or between the programs. Eren (2009) determined that belonging to a group encouraged adoption of mastery and performance goal orientations, and the adoption is mediated by the student’s similarity to the total group, degree of acceptance in the group, and perceived effort of belonging.

The students’ perceived value of learning tasks in the classroom affected learning and achievement goal orientation (Ames, 1992; McWhaw & Abrami, 2001). Malka and Covington (2005) noted that students were more likely to have a greater interest in learning when they determined that the course work was of value to future goals, though the investigators had difficulty differentiating between mastery and performance goal orientations of the students in their study. Additional studies have indicated that students who found a course or activity useful to future plans were motivated to learn, use better
self-regulation for learning, and get better grades (Hulleman, Durik, Schweigert, & Harackiewicz, 2008; Miller & Brickman, 2004).

Feedback to students by teachers can be mastery goal oriented if it is criterion-based, focused on the learning process, and related to the students’ own personal progress in knowledge acquisition (Retelsdorf & Günther, 2011). When students were encouraged to perform “reflection and evaluation of one’s work… [and] to develop feelings of ownership and responsibility for learning” (Paris & Paris, 2001, p. 95), teachers facilitated mastery goal learning in those students. Essay and short answer exams allow students with mastery goal orientations to elaborate on their knowledge, and multiple choice exams tend to favor students with performance goal orientations (Elliot et al., 1999). When Senko and Harackiewicz (2005a) explored the resilience of achievement goals during tasks when students were given only mild competence feedback (i.e., the students were told their scores were above average or below average), they noted that the achievement goals of students were affected by that feedback: (a) students maintained mastery goals but had a lower measure of mastery goal orientation after the mild competence feedback, and (b) students with performance goals were unsatisfied with the feedback and generally maintained their pre-feedback levels of performance goal orientations.

**Summary**

The achievement goal orientations and cognitive learning strategies used by students can impact knowledge acquisition and comprehension. Students with performance goal orientations were more likely to memorize or learn the material for a
learning product, for example a test or speech, and get good grades in a class. However, those students were more likely to be less organized and have more difficulty with using that learned information in other classes. Students with mastery goal orientations were more likely to delve into the material and relate it to prior learning and experiences. They were more likely to use deep processing cognitive learning strategies to retain the information for use in future activities. College students with mastery goal orientations were more likely to continue learning beyond the required introductory classes of the desired degree. Mastery goal orientations and deep processing cognitive learning strategies appeared to be beneficial for the student in a professional educational program such as occupational therapy, and Pintrich (1999) advocated for research about students in such less traditional college classroom settings.

**Occupational Therapy Education**

Students have enrolled in occupational therapy education (OT) programs with a variety of interests and goals for their post-college practice, most often citing a desire to help persons with disabilities and the chance to practice in myriad settings (Cooperstein & Schwartz, 1992). While students expressed a desire to learn specific skills for employability, Roksa and Levey (2010) found that the development of more generalized skills, for example written communication and critical thinking, was more beneficial for growth and flexibility in one’s career after getting a job. A mastery goal orientation, and the accompanying positive self-efficacy and deep processing cognitive learning strategies, would be congruent with marketing one’s self for a job after graduation (Bush, Powell, & Herzberg, 1993). Most of the research in the OT education field has been done with and about OT students in bachelor and graduate degree programs, so the information
may be inferred as applicable to OTA students in associate-degree professional programs, though further investigation in all OT education is warranted according to Bondoc (2005).

**Admission**

Admission to an occupational therapy educational program is usually very competitive. Most programs report two to three applications for each open seat in the starting class yearly. Admission committees typically consider several factors when reviewing these applications including the applicant’s ability to articulate goals for admission and completion of the program, prior academic achievement, and practical awareness of the job through observation of OT practice (Auriemma, 2002, 2007). Many committees review academic transcripts and grade point average, essays written by the applicant, and reference letters from OT practitioners; in 2007, Auriemma reported that there were 41 methods used by United States’ OT programs. There is an Occupational Therapy Centralized Application Service (OTCAS) that is provided by the American Occupational Therapy Association, which allows an applicant to enter materials electronically one time and have that application submitted to any or all of the participating OT educational programs. Only OT and OT doctorate programs are currently included in the OTCAS system at this time, so an applicant for an OTA program must apply directly to the school(s) of choice and may choose only to apply to local program (AOTA, 2014; King, 2012).

Predicting a student’s persistence to remain in and successfully complete an OT college program is challenging for admission committees (Auriemma, 2002; Katz &
Mosey, 1980; Kirchner & Holm, 1997; Lucci & Brockway, 1980; Lysaght, Donnelly, & Villeneuve, 2009; Posthuma & Sommerfreund, 1985; Schmalz et al., 1990). Occupational therapy and occupational therapy assistant educational programs typically operate with cohorts of students, as a class of admitted students will attend classes together throughout the entirety of their academic program. A student who fails or drops out of a cohort group is not usually replaced by another student, so successful and motivated learners are crucial to a program’s success (Belfield, 2012; Cohen & Ibrahim, 2008; Cooperstein & Schwartz, 1992). Kahn and Nauta (2001) noted that social-cognitive assessments and the grade point averages of students in their first and second semesters of college were more likely to predict persistence to remain in college for another year, more than preadmission high school rank or standardized test scores. Choosing students who will successfully enroll in and complete an occupational therapy education is important to the educational program and to the profession (Katz & Mosey, 1980; Schmalz et al., 1990; Swinehart & Feinberg, 1990).

**OTA Educational and Practice History**

The first occupational therapy assistant (OTA) students in 1960 completed a 12-week training program for OT practice only in treatment clinics in psychiatry (Cottrell, 2000). Their limited practice was purely in craft activities as directed by an occupational therapist, and the OTA had no recognition to practice beyond the hospital that provided the training. Cottrell outlined the changes in OTA education from the first programs in 1960 educating aides to become OT assistants to the present two-year degree programs with extensive accreditation regulations and monitoring by ACOTE. Accreditation of an educational program permits students to enroll in an OTA program that has participated...
in a rigorous and ongoing process for a quality educational experience. In December 2013, there were 194 accredited OTA educational programs in the United States, including Puerto Rico and the District of Columbia, and over eight thousand students enrolled (AOTA, 2012).

The curriculum for OTA educational programs has changed since those initial 12-week training programs. The current standards for the OTA curriculum framework state:

The curriculum must include preparation for practice as a generalist with a broad exposure to current practice settings (e.g., school, hospital, community, long-term care) and emerging practice areas (as defined by the program). The curriculum must prepare students to work with a variety of populations including, but not limited to, children, adolescents, adults, and elderly persons in areas of physical and mental health. (ACOTE, 2011, p. 16)

During classes, the OTA students learn about OT tenets, ethics, theories, and practice techniques. After successful completion of classroom education and observation in various clinical settings, the student must satisfactorily complete 16 weeks of fieldwork practice under the supervision of a professional OTA or occupational therapist. During that time, the student is responsible for treating patients, documenting services, and performing professional activities. After successful completion of classroom courses and fieldwork practice, the student is then eligible to take the certification exam as administered by the National Board for Certification in Occupational Therapy (NBCOT) to become an accredited professional.
There are over 34,500 OTA practitioners in the US (AOTA, 2010) who provide treatment to patients under the guidance of a treatment plan developed by the occupational therapist (OT), and few OTA professionals work within line of sight of or daily supervision by an OT. While their treatment activities are guided by the OT, the OTA professional needs good discernment skills to determine when to act independently to modify a treatment activity and when to call upon the expertise of the supervising OT. The instructional practices used in the OTA educational process can facilitate that greater self-regulation of thinking and practice activities.

**Instruction in OT Educational Programs**

Instructional practices can deepen understanding of a subject area and promote the synthesis of past and current knowledge. The OTA program has goals to help the student with development of good treatment skills and lifelong learning skills (AOTA, 2007). However, a search in the American Journal of Occupational Therapy (AJOT; the premier research journal for the profession) from 1980 to 2008 indicated one article about an instructional practice for the OTA level of education which reported the use of a humanistic learning theory (Bloss-Brown & Schoening, 1983). All other instructional articles in AJOT found since 1980 address educational research for the baccalaureate and graduate OT levels of education, descriptions of educational programs for the OTA who wishes to become an OT, and the publication of AOTA documents about OT education. While Bondoc (2005) noted limited research about educational practices in OT from 1996 to 2005, there has been an emphasis since then on building scholarship about the OT educational process within the profession, particularly during annual professional conferences (Gupta & Rice, 2008; Thomas & Javaherian, 2007).
Early studies of instructional practices examined the learning styles of OT and other allied health students, reporting a preference for a more informal and active classroom style over pure lecture settings (Barris, Kielhofner, & Bauer, 1985; Llorens & Adams, 1978; Rezler & French, 1975). Leonardelli and Gratz (1986) advocated for a change in OT education from a technical treatment skill focus to a concentration on the development of thinking and problem-solving skills. Educators incorporated additional teaching methods in OT programs, including lecture/lab experiences, and group and individual research and presentations during class (Dal Bello-Haas, Bazyk, Ekelman, & Mildonis, 1999; Neistadt, 1999; Nolinske & Millis, 1999; Seruya, 2007). Current studies show that OT faculty are using the following instructional techniques: (a) active learning (Gardner, Baglieri, & Andujar, 2012; Smallfield & Anderson, 2012), (b) clinical evaluation in the classroom of simulated and videotaped patients (Liu, Schneider, & Miyazaki, 1997; Neistadt, 1992), (c) student reflection (Carlson, 2013), (d) team teaching (Billock, 2006), (e) community service projects (Scott, 1999), (f) case-based learning (Seruya, 2007), and (g) inquiry-based learning (Madill et al., 2001). Problem-based learning has been used as the basis for many OT programs’ curricula and classes (Hammel et al., 1999; Liotta-Kleinfeld & McPhee, 2001; McCarron & D’Amico, 2002; McNulty et al., 2004; Neistadt, Wight, & Mulligan, 1998; Reeves et al., 2004; Royeen, 1995; Salvatori, 2000; Scaffa & Wooster, 2004; Stern, 1997).

Medical and allied health programs have used the problem-based learning (PBL) approach effectively for integrating material from different classes and applying learned material to real-life clinical practice (McNulty et al., 2004; Royeen, 1995; Scaffa & Wooster, 2004; Stern, 1997). Critical thinking and reflective thinking skills have been
documented outcomes of the PBL approach in some studies (Hammel et al., 1999; Hmelo-Silver et al., 2007; McCarron & D’Amico, 2002; Reeves et al., 2004; Royeen, 1995; Seruya, 2007; Stern, 1997; Sungur & Takkaya, 2006). The current national OT certification exam has situation-based test items which mirror the PBL approach, and students from PBL programs have passed the exams at very acceptable rates (Liotta-Kleinfeld & McPhee, 2001; Rosing, 1997; Salvatori, 2000).

With so many options today for instructional practices, OT faculty members have much to consider when developing their courses. Leonardelli and Gratz (1986) found that the match between stating educational goals and selecting appropriate teaching methods was overshadowed by the limited knowledge of teaching models expressed by at least half of the OT faculty members who participated in the study at that time. OT faculty members are often recruited from clinical practice and may have limited educational training about the instructional process (Crist, 1999; Leonardelli & Gratz, 1986; Mitcham & Gillette, 1999). Some academic institutions provide some training in curriculum and lecture preparation (Dempsey, 2007), and AOTA has provided or supported faculty workshops annually since 1993 (Crist, 1999; Mitcham & Gillette, 1999). AOTA (2009) adopted a paper outlining five attributes, with accompanying skills and specialized knowledge, for OT educators as they develop from novice to advanced educators.

**Summary**

The process for admission to an OTA educational program frequently begins with consideration of a student’s prior GPA which can be associated with a performance goal orientation for learning (Ames, 1992). The educational programs have an accreditation
standard to develop lifelong learners, which is associated with mastery goal for learning (ACOTE, 2011; Pintrich, 2003). Many instructional practices have been investigated with OT students but not OTA students (Hammel et al., 1999; Salvatori, 2000). The OTA professional educational programs cannot teach everything the students may need in their future practice, and students need to understand that completion of a community college degree should not be the final educational pursuit for OTA practitioners (Torraco, 2008). Educators must help students acknowledge limitations in current knowledge and consider plans for future knowledge acquisition (Gupta & Rice, 2008; Leonardelli & Gratz, 1986; McKenna, Scholtes, Fleming, & Gilbert, 2001; Royeen, 1995; Thomas & Javaherian, 2008). Continued learning after completion of a scholarly program is reviewed in the next section.

**Continued Professional Learning**

Webster-Wright (2009) advocated for the terminology of “continuing professional learning” (p. 704) to describe the enhancement of professional skills and knowledge, instead of using the terms professional development or continuing education which imply that the professional is not fully prepared to work upon completion of an accredited educational program. In the United States, the requirements for continued professional education after initial licensure as an OTA vary by state and are mandatory in all but eight states as of 2012 (AOTA, 2012). In addition to attending professional workshop and independent learning, the OTA’s presentation at a conference, professional service to the community, and publication of scholarly articles are acceptable methods for meeting nationally recognized professional recertification (NBCOT, 2014). Occupational therapists have been reported to follow the rules of states that mandated continued
professional learning, and the two primary motivators for participation in these activities were personal motivation and professional responsibility (Lysaght, Altschuld, Grant, & Henderson, 2001). Meeting the needs of the consumer using the unique services of one’s discipline was valued by OTs (Bush et al., 1993; Jones & Kirkland, 1984; Lysaght et al., 2001) and has been cited by practicing nurses as a motivation for integrating education from a workshop into their daily practice (Daley, 2001). Monitoring of one’s practice skills, job evaluation, and encouragement by supervisors provided impetus for health practitioners to engage in CPL (Bush et al., 1993; Lysaght et al., 2001; Støren, 2013; Thomas & Qui, 2011). Simply attending professional educational conferences to meet the educational requirements for maintenance of one’s professional license does not imply motivated, genuine learning to further one’s knowledge base (Torraco, 2008).

Planning for participation in continued professional learning (CPL) should not wait until after graduation from a professional educational program. Bush, Powell, and Herzberg (1993) advocated for the development of the student’s self-efficacy during the OT educational program to develop learning management skills, and to increase persistence during stressful and difficult fieldwork and practice situations. When he asked how community college instructors encouraged continued learning after graduation, Torraco (2008) found that recent graduates of healthcare programs similar to an OTA program could not recall more than brief counsel to “earn continuing education units” (p. 224). Lysaght et al. (2001) further stated that a culture that encouraged the OT student and professional to seek lifelong learning “may need to derive from our professional education programs” (p. 34) and warranted further research.
Summary

Achievement goal theory acknowledges that students have motivational goal orientations for learning (Ames & Archer, 1988). Students with performance goal orientations strive for the products of learning such as good grades and pleasing a teacher (Ames, 1992). Students with performance goals have been found to frequently use surface cognitive learning strategies such as memorization of facts and had less organized study skills (Pintrich, 2004). Students with mastery goal orientations have been found to value the process of learning, trying to increase their own knowledge, and enjoyment of the effort to master a task (Nicholls, 1984). These students use deep processing cognitive learning strategies for learning such as linking new material to past knowledge and evaluating their progress with new learning with comparisons to their own prior knowledge (Pintrich, 2000).

Achievement goal theorists have acknowledged that classroom instructional practices influence the learning goal orientations of students (Ames & Archer, 1988; Kumar & Maehr, 2007). Performance goal orientations were increased when the teacher compared students to one another or had a focus on normative grading (Retelsdorf & Günther, 2011). Mastery goal orientations were encouraged when the teacher emphasized personal knowledge growth, small group collaborative learning, and opportunities for students to share ideas without comparison to peers (Barron & Harackiewicz, 2003).

A stated goal of OT education is to develop lifelong learners (ACOTE, 2011). Educational strategies and philosophies have been examined in the baccalaureate and graduate levels of OT professional preparation but not at the OTA community college.
level (Neistadt et al., 1998; Reeves, 2004; Royeen, 1995). For all OT student applicants, the competitive admission process, with an emphasis on prior GPA, may attract students with a performance goal orientation (Auriemma, 2007; Pintrich, 2004). Instructional practices during the educational process should facilitate a mastery goal orientation for critical thinking and best practice of occupational therapy (Pintrich et al., 1987). Students’ myriad plans for continued professional learning (CPL) may be related to a mastery goal orientation which could help students focus on assessing their own knowledge and increasing that knowledge for effective professional practice (Thomas & Javaherian, 2008).
Chapter Three

Methodology

This chapter presents the research methodology to assess the relationship between instructional practices in an introductory occupational therapy (OT) course and the personal goal – mastery and performance – orientations of first-year occupational therapy assistant (OTA) students. The methods used to explore the assessment of OTA students’ mastery and performance goal orientations, use of cognitive learning strategies, and plans for continued professional learning (CPL) after a competitive admission process and any changes at the end of the first semester and into the next semester are included in this chapter. Research questions and hypotheses are revisited, followed by descriptions of the population and sample, variables, data collection procedures and management, and instrumentation. The planned data analyses are explained for the research questions of the study.

Research Questions

The following research questions (RQ) guided the data collection:

RQ1. Do introductory OT class instructors use more mastery or more performance instructional practices in the class?

RQ2. Do students have more performance and less mastery goal orientations at the beginning of the introductory OT class?

RQ3. Do OTA students use more surface and less deep processing cognitive learning strategies at the beginning of the class?
RQ4. Are there changes in personal goal – mastery and performance – orientations of students after participating in the introductory class?

4a. Are any changes sustained or increased in the next semester?

RQ5. Are there changes in the use of surface and deep processing cognitive learning strategies after participating in the introductory class?

5a. Are any changes sustained or increased in the next semester?

RQ6. What is the number of plans for continued professional learning (CPL) at the beginning of OTA educational program?

6a. Does the number of CPL plans increase after participation in an introductory OT class?

6b. Does the number of CPL plans remain sustained or increased in the next semester?

RQ7. Are any changes in students’ reported use of cognitive – surface and deep processing – learning strategies from Time 1 to Time 2 to Time 3 associated with changes in their mastery and performance goal orientations?

RQ8. Are any changes in students’ mastery and performance goal orientations associated with changes in the number of plans for CPL from Time 1 to Time 2 to Time 3?

RQ9. Is the use of mastery and performance instructional practices in the introductory OT class associated with changes in students’ personal goal – mastery and performance - orientations from Time 1 to Time 2 to Time 3?
Research Hypotheses

The following research hypotheses (RH) guided the study:

RH1. Instructors are likely to use more performance and less mastery instructional practices in the introductory OT class because instructors tend to emphasize grades (Crist, 1999; Dempsey, 2007).

RH2. OTA students are likely to have more performance and less mastery goal orientations at the beginning of the introductory OT class because of having participated in a highly competitive admission process.

RH3. Students are likely to use more surface and less deep processing cognitive learning strategies at the beginning of the class.

RH4. Students are likely to have more performance and less mastery personal goal orientations after participation in the class than at the beginning of the class.

4a. Students are likely to have sustained or increased performance goal orientations and decreased mastery goal orientations in the next semester.

RH5. Students are likely to use more surface and less deep processing cognitive learning strategies after participation in the class than at the beginning of the class.

5a. Students are likely to have sustained or increased surface cognitive learning strategies and decreased deep processing cognitive learning strategies in the next semester.

RH6. Students are likely to have a low number of plans for continued professional learning at the start of the OTA program due to unfamiliarity with the CPL requirements and ethos of the profession.
6a. Students will have a greater number of plans for continued professional learning (CPL) after participation in an introductory OT class which introduces professional requirements and ethos for CPL.

6b. Students are likely to have a sustained or increased number of CPL plans in the next semester.

RH7. Increased deep processing and decreased surface cognitive learning strategy use will be associated with an increase in personal mastery goal orientation over time. Increased surface and decreased deep processing cognitive learning strategy use will be associated with an increase in personal performance goal orientation over time.

RH8. Increased mastery goal orientations over time will be associated with an increased number of CPL plans over time. Increased performance goal orientations over time will be associated with a decreased number of CPL plans over time.

RH9. The use of more mastery and less performance instructional practices will be associated with students’ increased mastery and decreased performance goal orientations over time. The use of more performance and less mastery instructional practices will be associated with students’ increased performance and decreased mastery goal orientations over time.

Population and Sample

The target population for this study included first-year OTA students at accredited OTA educational programs in three Midwest states of the United States that offer students an introduction to OT course in the first semester after admission to the program. First-year OTA students who are newly enrolled in OTA educational programs have not
had their learning goal orientations affected by the cohort experience or the instructional practices in the OTA classroom, allowing for a more accurate assessment of their personal goal—mastery and performance—orientations upon admission. Some OTA programs offer an introductory OT class to students before they are admitted to the OTA program, and the study criterion will assure that students are already accepted in the program and not merely exploring an interest in becoming an OTA. The introductory course will be used as a course that is common to all first-year OTA students to increase consistency in the instructional content of the class.

There were 32 accredited OTA programs in Michigan, Ohio, and Pennsylvania. Several programs did not meet the criterion of providing the introductory OT class after admission of the student. Fifteen OTA programs offered classes in a semester format which provided a potential sample of 15 instructor subjects. All the program directors were contacted by phone and/or e-mail to solicit participation in the longitudinal study.

Student participants for the study were recruited during the introductory class in occupational therapy. Each program typically enrolled 20 to 30 students, and all students in the class were invited to participate in the study. There was a potential for up to 360 student participants.

Participating program directors identified a contact person who provided the surveys and data collection materials to the instructor and student participants. A complete description of the data collection is included in a subsequent section.
Variables

Dependent and independent variables for this study included instructional practices, personal goal orientations, cognitive learning strategies, and plans for continued professional learning. The variables are outlined in the next sections.

Dependent Variables

Mastery instructional practices. Mastery instructional practices include a constellation of activities that encourage students to increase intellectual development through effort, improvement of knowledge and skill, and engagement in challenging activities (Kumar & Maehr, 2007).

Performance instructional practices. Performance instructional practices include a constellation of instructional activities that emphasize students’ performance in relation to others (Kumar & Maehr).

Points of assessment. The baseline point was near the beginning of the first semester after student enrollment in the OTA educational program. The second assessment point was in the week before exams at the end of the first semester. The third assessment point was four weeks after the start of the second semester.

Independent Variables

Mastery goal orientation. This motivational construct is an aspiration or reason for learning that is characterized by a desire to learn for the sake of learning, to enjoy the challenge of a learning task, and a willingness to exert effort for learning. The focus for evaluating progress in learning is through comparison of one’s own current and past knowledge or ability.
Performance goal orientation. This motivational construct is an ambition for learning that is characterized by demonstration of ability by getting a high grade or recognition of one’s learning product or by showing that one is not less able than others. The evaluation of progress in learning is through interpersonal comparison with peers.

Deep processing cognitive learning strategies. These strategies are associated with self-directed study skills that may include persistence on a learning task, critical thinking, elaboration of ideas, and concept mapping.

Surface cognitive learning strategies. These strategies are often identified as repetitious reading of text, rote memorization of facts and definitions, and procrastination of study efforts.

Continued professional learning (CPL) plans. These intentions are what a student proposes to do after graduation for maintenance of a license and to maintain or improve practice skills.

Instrumentation

Paper surveys were used to collect data from instructors and students in OTA educational programs. A survey is designed to collect high-quality and valid information from a population with as much accuracy as possible (Fowler, 1993; Teo, 2013). Face-to-face interview and telephone surveys can be fraught with social bias if the interviewer represents a threatening persona or one to be pleased in the eyes of the respondent (Lalwani, Shrum, & Chiu, 2009). Responses and response rates for mail surveys have been stronger than those for e-mail surveys. Lefever, Dal, and Matthiasdóttir (2007) found response rates for e-mail surveys as low as 24% among students, and they
speculated that fatigue for e-mail survey requests and concerns about privacy could be factors in decreased e-mail responses. When college students in a nationwide survey were given the opportunity to respond to the survey by paper or web-based survey, only 22% of students chose to make web-based responses, and students overall had nearly equal response rates by paper or web (Carini, Hayek, Kuh, Kennedy & Ouimet, 2003). Though e-mailed surveys can be less costly to distribute, the accuracy of e-mail addresses is critical and would require permission of the participants for acquisition by a researcher. Bachmann, Elfrink, and Vazzana (1996; 1999) found decreased return rates, only 19%, and increased non-deliverable rates for e-mail surveys in their 2000 study when compared to their 1996 study. Bachman et al. also reported that mailed paper survey response rates dropped from 65.6% in the first study to 46% in the second study. Teo (2013) found no significant variance in responses for online versus paper surveys, though he noted that paper surveys allowed for a participant to review and change an answer if a question was initially misread by the participant. The survey instruments used in this study had a large number of items that seemed suited to a paper survey format to encourage higher response rates from participants.

**Instruments to Assess Student Goal Orientations, Cognitive Learning Strategies, and Plans for Continued Professional Learning (CPL)**

**Mastery and performance goal orientations.** Measures to assess the personal goal orientations were taken from the Motivated Scales for Learning Questionnaire (MSLQ; Pintrich et al., 1991). Mastery and performance goal orientations were evaluated with four items for each goal orientation. The items included mastery statements such as “The most satisfying thing for me in this course is trying to understand the content as
thoroughly as possible” and performance statements such as “Getting a good grade in this class is the most satisfying thing for me right now” (see Appendix A for all items). The items on the MSLQ were written with instructions for the students to consider the class in which the survey was distributed when making responses.

The items were self-rated by students from 1 (Not at all true of me) to 7 (Very true of me). The rating scale was used as provided in the MSLQ manual and did not include a center point identifier of “Somewhat like me”, which may be a limitation to the rating scale. The scores for the mastery items were totaled and averaged; an average of more than 4.0 indicated that the student had a stronger than average mastery goal orientation. The same scoring procedure was used for the performance goal orientation.

The MSLQ has been used with thousands of college students since it was published in 1991 (Credé & Phillips, 2011; Jacobson & Harris, 2008; McClendon, 1996). The MSLQ manual reported Cronbach’s alpha of .62 for the mastery goal orientation items and .74 for the performance goal orientation items (Pintrich et al., 1991). A meta-analytic review by Credé and Phillips reported reliabilities of .69 for mastery goal items and .66 for performance goal items (2011).

**Cognitive learning strategies.** The MSLQ was used to assess students’ use of cognitive learning strategies. As noted previously, the 34 items were rated from 1 (Not at all true of me) to 7 (Very true of me) without a center point identifier of “Somewhat like me”, which may be a limitation to the rating scale. The same procedures for scoring as noted with goal orientation scales were used for the surface and deep processing cognitive learning strategies scales.
The MSLQ has nine separate scales for learning strategies, with the manual reporting goodness-of-fit indices (GFI) of .77 to .78 (Pintrich et al., 1991). Dunn, Lo, Mulvenon, and Sutcliffe (2012) conducted factor analyses with the metacognitive self-regulation and effort regulation scales and determined that excluding four items supported a GFI of .96 for each of two new scales called general strategies for learning and clarification strategies for learning.

The scales for the use of surface and deep processing cognitive learning strategies included six scales from the original MSLQ (Pintrich et al., 1991) and the two modified scales identified by Dunn et al. (2012) (see Appendix A for the list of all items used in these scales). Help seeking and rehearsal scales included eight items which were used for the use of surface cognitive learning strategies scale. The 26 items for the use of deep processing cognitive learning strategies scale included the elaboration, general strategies for learning, organization, critical thinking, clarification strategies for learning, and peer learning scale items. For the scales constituting the use of deep processing cognitive learning strategies scale, the MSLQ manual reported Cronbach’s alpha reliabilities ranging from .64 to .80 while Credé and Phillips (2011) reported averaged reliabilities of .59 to .77 for those same scales in their meta-analysis of the MSLQ. For the two scales of help seeking and rehearsal used in this study to constitute a scale for the use of surface cognitive learning strategies, the MSLQ manual (1991) reported Cronbach’s alpha of .69 and .52, and Credé and Phillips (2011) reported averaged reliabilities of .59 and .68 for those scales.

**Plans for continued professional learning (CPL).** The 14 items for this scale were written by the investigator based on professional experience and continued
professional learning suggestions from NBCOT (2013) (see Appendix A for a list of the CPL items). The instructions were written for the student to check off the plans that applied to him or her in the future (“Plans for continued professional learning after OTA school: I will (check all that apply”). The CPL statements included items such as “do what my state licensing board requires for my OTA license” and “go to national AOTA conference for continuing education only if work pays for it”. No time frame except for post-graduation was indicated for implementation of the plans. Each item was counted as one plan for CPL, and the items checked were totaled; possible scores ranged from 0 to 14 plans.

Instrument to Assess Mastery and Performance Instructional Practices

Nine items from the Patterns of Adaptive Learning Scales (PALS, Midgley et al., 2000) were used to assess mastery and performance instructional practices (see Appendix B for scale items). The PALS manual reported that each scale had an alpha of .69 (Midgley et al., 2000). The mastery and performance approaches to instruction have been used extensively and effectively with elementary through high school teachers (Kumar, 2006; Meece et al., 2006; Negru & Damian, 2010; Wolters et al., 2011).

Four mastery items included statements such as “I consider how much students have improved when I give them grades”, and five performance items included statements such as “I display the work of the highest achieving students as an example”. The items were self-rated by instructors from 1 (Not at all like me) to 5 (Very much like me); the scale anchors were modified from the original 1 (Strongly disagree) to 3 (Somewhat agree) to 5 (Strongly agree) which may be a limitation. The scores for the mastery instructional practice items were totaled and averaged; an average score of more
than 3.0 indicated that the instructor used more than average mastery instructional practices. The same scoring procedure was used for the performance instructional practices items.

**Data Collection Procedures**

Program directors at each OTA program were asked to provide the name of a contact person at each program who would receive the survey materials from the investigator and thus facilitate anonymity of the students and instructor. The contact person served by distributing, collecting, and returning paper surveys to the first-year OTA students. The contact person also distributed the surveys and return envelopes to the instructor of the introductory OT class.

**Instructor surveys.** The instructor survey was distributed at the beginning of the introductory OT class with a pre-addressed and stamped business envelope for anonymous return by the instructor. The instructors received a second survey and return envelope at Time 2 which was in or near the week before exam week of the class. The surveys were coded by the investigator only with a program code number.

**Student surveys.** Paper surveys were distributed to students during the introductory OT class early in the semester and during the week prior to exam week of the same semester. The third survey distribution was approximately four weeks after the start of the second semester in a class designated by the investigator. While OTA course sequences vary from school to school, the investigator chose a class that was similar in disciplinary context for all programs. As suggested by the instrument used for student surveys, the surveys were distributed during the classes to associate the survey with the class used for distribution. A pre-addressed and stamped large envelope was provided by
the investigator for collection of student surveys and return without cost to the OTA program.

Anonymity of respondents was assured to students by the scripted instructions provided by the investigator which were to be read aloud during distribution of the student surveys and in letters given to the students with each survey. The investigator provided a program number and assessment time code on the student survey forms. The surveys were further self-coded by individual students with investigator-provided instructions to use the first five letters of his or her mother’s last name and personal birth date of the month, e.g., 24 for a birthday on the 24th of the month.

The investigator provided surveys to each program based on the enrollment numbers provided by the program directors. A letter to students about the survey outlined a $25 gift card incentive for one student from each program who responded three times when the program had at least a 75% or better response rate at all three time points. Students were provided with a business envelope for survey return to the single large collection envelope; the business envelope could be sealed to permit the student to return a blank or completed survey.

Students were asked to complete the surveys outside of class to enhance response anonymity and avoid collectivism which is the influence of peers in one’s responses (Lalwani et al., 2009). In addition, because each survey took about 20 to 30 minutes for completion, students’ completion outside of the class was designed to avoid interference with classroom instructional time.

Program director survey. Each program director received a written request for the typical yearly numbers of received applications and admitted students to indicate the
competitive nature of OTA program admission. A stamped and pre-addressed envelope was provided for return of this survey.

**Planned Data Analyses**

Descriptive analyses were planned to portray the OTA programs and the OTA student participants. Descriptive tables portrayed the OTA programs’ application and admission data. Response rates for the students at Times 1, 2, and 3 were determined using the enrollment reported by the OTA program directors. Analyses of respondents’ data included descriptive measures (mean, standard deviation, range of minimum and maximum values), paired-sample *t*-test, analysis of variance (ANOVA) and growth curve modeling (GCM) techniques as described in this section.

**Paired-Sample *t*-test Analyses**

The use of a *t* statistic is useful when the population variance is unknown and the population is smaller than 30 (Gravetter & Wallnau, 2002). The student sample size may vary from Time 1 to Time 2 to Time 3, depending on the voluntary participation of students in the introductory class and potential student dropouts during and after the first semester. In addition, the students selected after participation in the competitive admission to the OTA program are likely to create a population with less variability in scores than might be expected with college students enrolled in a large university’s introductory psychology class, a population frequently cited in achievement goal orientation studies. These assumptions lead to the use of a *t* statistic for this sample.

A paired-sample *t*-test is used when comparing the means of a matched sample before and after a treatment, for example students in this study whose means for mastery
and performance goal orientations can be compared at the beginning and end of an introductory OT class. While there might have been increased mastery goal orientation means after participation in the class, the difference was not likely to be large from the start of the semester to the end of the same semester. As McDonald (2009) noted, “Using a paired t-test has much more statistical power when the difference between groups is small relative to the variation within groups”.

**Analysis of Variance (ANOVA)**

An analysis of variance permitted evaluation of the total variance that occurs because of variances between and within treatments (Gravetter & Wallnau, 2002) with the means of a group. The between treatment variances can be caused by the effects of the instructional practices, time, and chance in this study. The within treatment variances can be a result of chance. ANOVA accommodated for the cumulative effects of multiple testing with larger groups that may have different variances and sample sizes.

**Growth Curve Modeling Analysis**

Growth curve modeling (GCM) analysis permitted examination of the variances in developmental changes in individuals over time. Students in this study participated at three time points, at the beginning and end of the first semester and again four weeks into the second semester. Changes in behavior or mentation do not always follow an evenly straight, consistent path (McCoach & Kaniskan, 2010; Panik, 2014). GCM describes an “individual’s developmental trajectory, but [it] also captures individual differences in these trajectories over time” (Duncan & Duncan, 2004, p. 334). The slope of the behavior and the intercept of time on the slope are both captured with GCM such as, in this study, when examining the hypothesized growth in the use of deep processing cognitive
learning strategies assessed at three times during the first year of the OTA educational program experience. The model also permits one to “capture the vital group statistics in a way that allows the researcher to study development at the group level” (Duncan & Duncan, 2004, p. 335). Growth curve modeling “takes into account both factor means, which correspond to group level information, and variances, which correspond to individual differences” (Duncan & Duncan, 2004, p. 335). Thus, the individual’s growth or change in one variable can be evaluated individually, with its variances, and with a group of individuals such as all the students in one OTA educational program to determine the influence of the identified predictors on that change. “Consistency among students in changes across time is referred to as fixed effects, and variability among students in change across time is referred to as random effects” (R. Kumar, personal communication, April 28, 2015). Growth curve modeling accommodates for missing data, allowing for comparison of the trends of the students within and between programs.

The HLM 7 hierarchical linear and nonlinear modeling program (Raudenbush, Bryk, & Congdon, 2010) for GCM was used for analysis of data in this study. The model predicted score is \( \hat{\pi}_{0i} + \hat{\pi}_{li} \times \text{TIME}_i \) where \( \hat{\pi} \) is the predicted value. McCoach and Kaniskan (2010) noted that deviance is a “measure of the badness of fit of a given model” (p. 10) to a perfect model and is also a “function of sample size” (p. 11). The HLM program used deviances derived from restricted maximum likelihood estimation (REML) which may be used with “hierarchically nested models that differ only in terms of their random effects” (McCoach & Kaniskan, 2010, p. 11). Reliability estimates are an indication of the parameter variance to the total variance for the intercepts and slopes (Bryk & Raudenbush, 1987). Time is coded as 0 for the initial point of the study; in this
study Time 1 corresponds to 0, Time 2 corresponds to 1, and Time 3 corresponds to 2. Thus at level one a student’s score at Time 1 is coded as 0, a recoding which gives no slope value when inserted in the equation because the score is baseline.

Growth curve modeling was used to examine any changes in the students’ mastery and performance goal orientations, use of deep processing and surface cognitive learning strategies, and plans for continued professional learning. Additionally, GCM was used to examine the relationship of changes in the mastery and performance goal orientations to the use of cognitive learning strategies and the plans for CPL. Using predictors of the introductory class as more mastery and less performance focused in the use of instructional practices and vice versa, a third level of GCM allowed for examining the relationship between mastery or performance instructional practices at the classroom level and students’ mastery and performance goal orientations at the individual level.

The study used two-level and three-level models. At level-1 is the within-student model which examined the growth trajectory as the student moved from the beginning of the first semester to the fourth week in the second semester of the program. The level-2 model was the between-student model. The level-3 model incorporated the instructor’s mastery or performance focused instructional practices as a predictor of students’ personal goal orientations. Descriptions of the models used for the personal goal orientations, use of cognitive learning strategies, and continued professional learning are elaborated in the next paragraphs.

**Personal mastery and performance goal orientations and the relationship of instructional practices to students’ personal goal orientation.** The personal goal orientations of students were examined with the unconditional level-1 within-student and
level-2 between-student models. Additionally, the level-three model examined the relationship of the classroom context as having more mastery or performance focused instructional practices as a predictor for students’ personal goal orientations.

**Level-1 model.** The within-student that is the unconditional model estimated the variability within a student for mastery and performance goal orientations at Time 1 (intercept) and change in these goal orientations from Time 1 to Time 3 (slope). The equation for the within-student unconditional model for student’s mastery goal orientation (Mastery) is provided:

\[ Y_{(Mastery)ij} = \pi_{0ij} + \pi_{1ij} (\text{Time})_{ij} + e_{ij} \]

where

- \( Y_{(Mastery)ij} \) = mastery goal orientation for student \( i \) in program \( j \) at time \( t \),
- \( \pi_{0ij} \) = mastery goal orientation for student \( i \) in program \( j \) at Time 1 (linear time variable = 0),
- \( \pi_{1ij} \) = linear change in mastery goal orientation for student \( i \) in program \( j \) from Time 1 to time 2 to Time 3, and
- \( e_{ij} \) = the estimate of variance in change in mastery goal orientation that is due to factors within-student \( i \) in program \( j \).

The equation for performance goal orientation is constructed in the same manner.

**Level-2 model.** The level-2 model is the between-student model. In the between-student model, the scores of individuals are assumed to vary between individuals based on background factors such as prior education and gender (Bryk & Raudenbush, 1987). The between-student residuals, \( r_{0ij} \) and \( r_{li} \), represent the deviation of the person’s
“intercept and slope at that time from the overall intercept and slope” (McCoach & Kaniskan, 2010, p. 1). Additionally, “the variance covariance matrix of $r_{0j}$ and $r_{ij}$ provides estimates of the between-person variability in the intercept, the slope, and the covariance between the slope and the intercept” (McCoach & Kaniskan, 2010, p. 1).

The following equations specify the between-student model (level 2):

$$\pi_{0j} = \beta_{00j} + r_{0ij},$$

$$\pi_{ij} = \beta_{0j} + r_{ij},$$

where

$\beta_{00j}$ = average mastery goal orientation for all students in program $j$,

$r_{0ij}$ = estimate of unexplained variance in mastery goal orientation for all students in program $j$,

$\beta_{0j}$ = change in mastery goal orientation from Time 1 to Time 2 to Time 3 for all students in program $j$, and

$r_{1ij}$ = estimate of unexplained variance in change in mastery goal orientation for all students in program $j$.

The final equation including the within and between student model is

$$Y_{(Mastery)ij} = \beta_{00j} + r_{0ij} + \beta_{0j} + r_{1ij} + e_{ij}.$$

**Level-3 model.** In this study, the level-3 model incorporates between class variables – mastery and performance focused instructional practices – as predictors for changes in students’ personal goal orientations. The following equations specify the final between-schools model (level 3):

$$\beta_{00j} = Y_{000} + Y_{001} + Y_{002} + u_{0j},$$
\[ \beta_{0j} = \gamma_{100} + \gamma_{101} + \gamma_{102} + u_{ij}, \] where

\[ \beta_{00j} = \text{mean mastery goal orientation at Time 1 for all students within a program } j, \]

\[ \gamma_{000} = \text{mean mastery goal orientation for all students,} \]

\[ \gamma_{001} = \text{effect of mastery-focused instructional practices on mastery goal orientation,} \]

\[ \gamma_{002} = \text{effect of performance-focused instructional practices on mastery goal orientation,} \]

\[ u_{0j} = \text{estimate of unexplained variance in mastery goal orientation for all students within a program } j, \]

\[ \beta_{0j} = \text{change in mastery goal orientation in a program } j \text{ from Time 1 to Time 2 to Time 3,} \]

\[ \gamma_{100} = \text{average change in mastery goal orientation for all students from Time 1 to Time 3.} \]

\[ \gamma_{101} = \text{effect of mastery-focused instructional practices on the change in students’ mastery goal orientation from Time 1 to Time 3,} \]

\[ \gamma_{102} = \text{effect of performance-focused instructional practices on the change in students’ mastery goal orientation from Time 1 to Time 3,} \]

\[ u_{1j} = \text{estimate of variance in average change in mastery goal orientation for all students in a program } j. \]

The equation for predicting students’ performance goal orientation is constructed in the same manner. Typically, at least 15 programs would be needed to effectively
evaluate the effect of mastery and performance instructional practices on changes in the students’ mastery and performance goal orientations.

**Use of cognitive learning strategies and the relationship of personal goal orientation to the use of cognitive learning strategies.** Growth curve models allowed for the exploration of both intra-individual change in the use of deep processing and surface cognitive learning strategies and the individual differences in the nature of that change. Growth curve modeling was used to examine whether change in the use of deep processing and surface cognitive learning strategies (identified in the equations as Deep and Surface, respectively) was shaped by changes in time varying covariates – students’ personal mastery and performance goal orientations. These analyses included only the within student model with the time varying covariates.

The model-1 level-1 equation for predicting the use of deep processing cognitive learning strategies is

\[ Y_{(Deep)it} = \pi_{0i} + \pi_{1i}(time) + e_{it}, \]

where

- \( Y_{(Deep)it} \) = score for the use of deep processing cognitive learning strategies for an individual student \( i \) at time \( t \),
- \( \pi_{0i} \) = use of deep processing cognitive learning strategies for student \( i \) at Time 1 (linear time variable = 0),
- \( \pi_{1i} \) = change in the use of deep processing cognitive learning strategies for student \( i \) from Time 1 to time 2 to Time 3, and
- \( e_{it} \) = the estimate of variance in change in the use of deep processing cognitive learning strategies that is due to factors within-student \( i \).
Model-2: The within-student equation for linear growth for predicting the use of deep processing cognitive learning strategies with mastery and performance goal orientations as time varying covariates:

\[ Y_{(Deep)itu} = \pi_{0i} + \pi_{1i}(time) + \pi_{2i}(mastery\ goal\ orientation) + \pi_{3i}(performance\ goal\ orientation) + e_{it}. \]

The equation for predicting the use of surface cognitive learning strategies is constructed in the same manner.

**Plans for continued professional learning and the relationship of personal goal orientation to the use of cognitive learning strategies.** The plans that a student has for continued professional learning were examined in the same fashion as noted in the section for the use of cognitive learning strategies. The plans for CPL were examined with the unconditional model and with the predictor parameters, namely mastery and performance goal orientations, in level-1 and level-2 models.

**Instructional Practices (Research Question 1)**

The scale properties for the instructors’ mastery and performance instructional practices were reported for reliability and skewness. The uses of mastery and performance instructional practices for the instructor sample were depicted with the means, standard deviations, and range of responses. A paired-sample *t*-test was planned to determine the statistical difference between the means for mastery and performance approaches to instructional practices.
The scale properties for the mastery and performance goal orientations and surface and deep processing cognitive learning strategy use were reported for reliability and skewness.

Descriptive analyses were used to portray the students’ mastery and performance goal orientations and their use of surface and deep processing cognitive learning strategies following a competitive admission process to an OTA program. The analyses included the means, standard deviations, and range of responses for the sample and by OTA program.

Paired sample t-test analyses were used with the sample to determine statistical significance in the differences between means of the performance and mastery goal orientations and between the means of surface and deep processing cognitive learning strategies at Time 1. One-way ANOVA procedures were planned to evaluate statistically significant differences in the means for mastery and performance goal orientations, deep processing and surface cognitive learning strategies, and the number of plans for CPL among the programs at Time 1. The programs were categorized as having instructors using higher mastery and lower performance instructional practices or having instructors using higher performance and lower mastery instructional practices.
Changes in Students’ Mastery and Performance Goal Orientations from Time 1 to Time 2 to Time 3 (Research Question 4)

Growth curve modeling was used to determine if there were significant linear changes in mastery and performance goal orientations from Time 1 through Time 2 to Time 3.

Changes in Use of Deep Processing and Surface Cognitive Learning Strategies With Mastery and Performance Goal Orientations as Predictors (Research Questions 5 and 7)

Growth curve modeling was used to assess whether there were significant changes in the use of deep processing and surface cognitive learning strategies from Time 1 to Time 2 to Time 3. GCM was used to assess whether any changes in these cognitive learning strategies were predicted by time-varying covariates – mastery and performance goal orientations.

Changes in Number of Plans for Continued Professional Learning With Mastery and Performance Goal Orientations as Predictors (Research Questions 6 and 8)

Descriptive statistics were used to depict the number of plans that students had for CPL at all three time points. Growth curve analysis was used to evaluate the changes in students’ plans for CPL. In addition, GCM analyses were used to examine whether any changes in surface cognitive learning strategies were predicted by time-varying covariates – mastery and performance goal orientations.
Relationship Between Instructional Practices and Changes in Students’ Personal Goal Orientations (Research Question 9)

Growth curve modeling was planned to evaluate the relationship between changes in students’ personal goal orientations and the use of mastery and performance instructional practices in the introductory OT class. A three-level growth curve model analysis allowed comparisons of the programs which were high in mastery and low in performance instructional practices and vice versa.

Summary

This study was designed to assess the mastery and performance goal orientations for learning, the use of deep processing and surface learning strategies, and the continued professional learning (CPL) plans of OTA students after a competitive admission to an OTA educational program. The study involved two waves of data collection during an introductory OT course in the first semester after admission and a third wave in the following semester. The instructor’s mastery and performance instructional practices in the class were surveyed at Time 1 and Time 2. Students’ goal orientations were assessed using mastery goal and performance goal orientation scales, and their use of learning strategies were assessed with deep processing and surface cognitive learning strategy scales. Plans for CPL were assessed with a scale using items written by this investigator.

Descriptive analyses were used to describe the competitive admission of the OTA programs and the mastery and performance instructional practices reported by instructors of the introductory OT class. The same analyses were used with students’ CPL plans at all three assessment points and for baseline mastery and performance goal orientations and the use of surface and deep processing cognitive learning strategies.
Longitudinal changes in students’ mastery and performance goal orientations, use of deep processing and surface learning strategies, and plans for CPL were determined with several statistical techniques. Paired-sample $t$-test procedures and growth curve modeling were used as described in this chapter. The results of these analyses and findings are reported in Chapter Four.
Chapter Four

Results

This chapter summarizes the findings of the study based on analyses of the data from surveys administered to occupational therapy assistant program directors, students, and instructors. Data were collected from three time points – at the beginning and end of the first semester and about four weeks in the next semester.

Analyses and Results

The analyses planned for the data included descriptive, paired-sample t-test, analysis of variance (ANOVA), and growth curve model. Frequency tables were used to describe the competitiveness of admission to the participating programs and the numbers of student respondents at each time and from each program. Growth curve model analyses were conducted based on students’ data for goal orientations, use of cognitive learning strategies, and the number of plans for continued professional learning across three time points. These analyses examined a) linear change over time in students’ goal orientations, use of cognitive learning strategies, and plans for continued professional learning, and b) relationship among these constructs. As only five out of the fifteen OTA programs participated in the study, the small number of programs precluded the inclusion of the third level between-program analysis. There were insufficient numbers of programs to conduct ANOVA analyses for cognitive learning strategies and plans for CPL based on groupings of the classrooms into two categories of high mastery and low performance goal orientations and high performance and low mastery goal orientations.
The results are presented in two major sections. The first section includes the descriptives for the competitiveness of admission, the instructors’ use of mastery and performance instructional practices, and students’ response rates. The second section includes results of analyses used to answer the research questions.

**Descriptives: OTA Program, Instructor, and Student Data**

Five of the 15 potential OTA programs agreed to participate in this longitudinal study. Three programs were located in Pennsylvania, and two programs were located in Ohio. The instructors teaching the introductory OTA course in each of the five OTA programs participated in the study. There were 125 students who responded during the study, and descriptives for the programs, instructors, and student respondents are included in the next sections.

**Descriptives: OTA Programs and Instructors**

The competitive nature of the admission process was evaluated using the information provided by the OTA program directors. The number of applicants and students typically accepted each year by the responding programs are shown in Table 1 and does not necessarily reflect the number of students accepted in the academic year for this study. No data were sought about the actual number of applications received for the academic year of this investigation. The averaged acceptance rate was 41% of applications typically received by the OTA programs participating in this investigation.
Table 1

Typical Yearly Numbers of Applications Received and Students Accepted

<table>
<thead>
<tr>
<th></th>
<th>Program 1</th>
<th>Program 2</th>
<th>Program 3</th>
<th>Program 4</th>
<th>Program 5</th>
<th>Overall Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applications</td>
<td>50</td>
<td>63</td>
<td>75</td>
<td>60</td>
<td>100</td>
<td>348</td>
</tr>
<tr>
<td>Received</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accepted Students</td>
<td>24</td>
<td>25</td>
<td>40</td>
<td>24</td>
<td>30</td>
<td>143</td>
</tr>
<tr>
<td>Total Average Acceptance Rate</td>
<td>48%</td>
<td>40%</td>
<td>53%</td>
<td>40%</td>
<td>30%</td>
<td>41%</td>
</tr>
</tbody>
</table>

All five instructors for the introductory OT class completed the instructor survey about their use of mastery and performance instructional practices at least one of the two data collection time points (Time 1 and Time 2). The instructor from Program 1 responded at both times. The instructor from Program 2 responded only at Time 2, and the other three instructors responded only at Time 1. Table 2 shows the instructors identified only by program and their scores for the use mastery and performance instructional practices.
Table 2

*Program Instructors’ Scores for Use of Mastery and Performance Instructional Practices at Time 1 and Time 2*

<table>
<thead>
<tr>
<th>Instructor in Program</th>
<th>Instructional Practices</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mastery</td>
<td>Performance</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>3.75</td>
<td>2.60</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>2.00</td>
<td>1.20</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>2.25</td>
<td>1.40</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>3.00</td>
<td>1.20</td>
</tr>
</tbody>
</table>

At Time 1 the instructors reported that they were more mastery focused ($M = 2.75$, $SD = 0.79$) and less performance focused ($M = 1.60$, $SD = 0.67$) in their instructional practices. The mastery scores were not extremely high when one considered that the midpoint score on the scale was 3.00, and only one instructor had a mastery goal orientation score higher than that midpoint. However, limited inference can be made about these findings because of the small number of instructor participants in the study; a more accurate description is simply that the instructors indicated they were using more mastery-focused instructional practices and less performance-focused instructional practices in the introductory OT class. The descriptives for the students in those classes are presented in the next section.
Descriptives: Student Response

The enrollment count for the introductory course in the five programs was 130 students, and 125 students responded at one or more times across the three time points. For various reasons, 17 of the student surveys were excluded by the investigator from the data analyses. Fifteen respondents did not provide the required identification code which was the first five letters of mother’s maiden name and the number for the student’s day of birth. Additionally, two surveys from one program were excluded because it was unclear whether the identification codes provided by the respondents at Time 1 and Time 3 corresponded to two unique individuals or to the same individual across the two time points. Of the final sample of 108 students, 39 students responded one time, 27 students responded two times, and 42 students responded three times. The numbers of accepted and rejected survey respondents are presented in Table 3 for each program at each time point.

Table 3

Accepted and Excluded Respondents at Each Assessment Time

<table>
<thead>
<tr>
<th>Program</th>
<th>Accepted Respondents (Excluded Respondents)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time 1</td>
</tr>
<tr>
<td>1</td>
<td>13 (3)</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>15 (2)</td>
</tr>
<tr>
<td>4</td>
<td>13 (1)</td>
</tr>
</tbody>
</table>
The response rates of the enrolled students varied greatly among the OTA programs ranging from 3% to 96%, with an overall averaged response rate of 64%. The number of surveys supplied to each program was equal to the number of enrolled students as reported at Time 1 by the OTA program directors; no information was gathered from the OTA programs about the number of student dropouts or those who failed out at Time 2 or Time 3 which could have altered the response rate calculations. The program director of Program 2 shared that the course instructor offered credit for service learning to increase the students’ participation in the study even though this procedure was not solicited nor suggested by the investigator. The response rates for the OTA programs and for the sample at each assessment time are shown in Table 4; the rates were calculated by dividing the number of returned surveys by the number of surveys supplied at each assessment time.

Table 4

Response Rates for Each OTA Program by Assessment Time

<table>
<thead>
<tr>
<th>Program</th>
<th>Rate (Respondents/Total Enrolled Students)</th>
<th>Overall Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time 1</td>
<td>Time 2</td>
</tr>
<tr>
<td>1</td>
<td>67%</td>
<td>71%</td>
</tr>
</tbody>
</table>
Table 4 (continued)

<table>
<thead>
<tr>
<th></th>
<th>96%</th>
<th>96%</th>
<th>96%</th>
<th>96%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>85%</td>
<td>30%</td>
<td>65%</td>
<td>60%</td>
</tr>
<tr>
<td>3</td>
<td>58%</td>
<td>75%</td>
<td>63%</td>
<td>65%</td>
</tr>
<tr>
<td>4</td>
<td>23%</td>
<td>3%</td>
<td>90%</td>
<td>39%</td>
</tr>
<tr>
<td>Total</td>
<td>63%</td>
<td>54%</td>
<td>75%</td>
<td>64%</td>
</tr>
</tbody>
</table>


The descriptive statistics for mastery and performance goal orientations, use of deep processing and surface cognitive learning strategies, and plans for continued professional learning (CPL) in this study are described in this section. A mean and standard deviation for each goal orientation and the two categories for the use of cognitive learning strategies are provided along with the Cronbach’s alpha reliability and skew for each scale.

Across the three time points, the mean for the four-item mastery goal orientation scale was 5.60, with a standard deviation of 0.79. The mastery goal orientation scale had a Cronbach’s alpha of .69, and the reliability approximated the reliabilities reported in the MSLQ manual (1991) of .62 and by Credé and Phillips (2011) of an averaged .69 in their meta-analytic study of the MSLQ. The skew of -0.43 indicated that the distribution of scores was approximately symmetric (Brown, 2015). Across the three time points, the mean for the four-item performance goal orientation score was 5.56 with a standard deviation of 0.95. The performance goal orientation scale had a Cronbach’s alpha of .70.
which was centered between the MSLQ manual reliability of .74 and the .66 reported by Credé and Phillips (2011). The performance scale score distribution had moderate skew of -1.18 which indicated that more of the scores were distributed with a longer tail to the left of the midpoint score of 3.50.

The 26-item deep processing cognitive learning strategies scale had a Cronbach’s alpha of .90 which is above the component scales’ alphas as reported in the MSLQ manual (.64-.80) and the averaged alphas of .68-.77 reported in the meta-analysis of Credé and Phillips (2011). The skew of -0.12 indicated that the distribution of scores was approximately symmetric. Across all three time points, the mean for the scores for the use of deep processing cognitive learning strategies was 4.94 with a standard deviation of 0.79. The eight-item scale for the use of surface cognitive learning strategies had a Cronbach’s alpha of .68 which was similar to the MSLQ manual (.52-.69) and the averaged reliabilities of .59-.68 reported by Credé and Phillips (2011). The surface cognitive learning strategies scale had skew of -0.36, again indicating that the distribution of scores was approximately symmetric. Across all three time points, the mean score for the use of surface cognitive learning strategies score was 5.13 with a standard deviation of 0.82.

The 14 items for the scale assessing plans for continued professional learning were developed by the investigator and not based on any previously established scale. Across the three time points, the mean number of plans for CPL was 11.44 with a standard deviation of 3.00. The Cronbach’s alpha for the CPL scale was .64 which according to George and Mallery (2003) is somewhat low. Further, skew of -1.41 indicated that the scores were somewhat highly skewed and on average distributed well
below the midpoint score of 7.0 plans, with a longer tail to the left. As noted above, these findings are summarized in Table 5.

Table 5

*Average Psychometric Properties for Goal Orientations, Cognitive Learning Strategies, and Plans for Continued Professional Learning Scales across Time 1, Time 2, and Time 3 (N = 108)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>α</th>
<th>M</th>
<th>SD</th>
<th>Potential</th>
<th>Actual</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery Goal</td>
<td>.69</td>
<td>5.60</td>
<td>0.79</td>
<td>1.00-7.00</td>
<td>2.75-7.00</td>
<td>-0.43</td>
</tr>
<tr>
<td>Performance Goal</td>
<td>.70</td>
<td>5.56</td>
<td>0.95</td>
<td>1.00-7.00</td>
<td>1.00-7.00</td>
<td>-1.18</td>
</tr>
<tr>
<td>Deep Processing CLS</td>
<td>.90</td>
<td>4.94</td>
<td>0.79</td>
<td>1.00-7.00</td>
<td>2.69-6.77</td>
<td>-0.12</td>
</tr>
<tr>
<td>Surface CLS</td>
<td>.68</td>
<td>5.13</td>
<td>0.82</td>
<td>1.00-7.00</td>
<td>2.38-6.88</td>
<td>-0.36</td>
</tr>
<tr>
<td>Plans for CPL</td>
<td>.64</td>
<td>11.44</td>
<td>3.00</td>
<td>0-14</td>
<td>1-14</td>
<td>-1.41</td>
</tr>
</tbody>
</table>

*Note.* CLS = cognitive learning strategies, CPL = continued professional learning.

The means, standard deviations, and ranges of scores for the goal orientations, use of cognitive learning strategies, and plans for continued professional learning for each of the three time points are presented in Table 6. The sample sizes for each scale in each program are noted due to the variability of respondent numbers at each time. There were no descriptive results at Time 2 for program 5 because only one student responded at that time. The measures are presented for each program to permit examination of the variability of students’ mean scores from time to time and among the programs.
### Table 6

**Descriptives: Mastery and Performance Goal Orientations, Use of Deep Processing and Surface Cognitive Learning Strategies, and Plans for Continued Professional Learning (CPL) at Time 1, Time 2, and Time 3**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Time 1</th>
<th>Time 2</th>
<th>Time 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (n)</td>
<td>M (SD)</td>
<td>Min-Max</td>
</tr>
<tr>
<td>Mastery Goal Orientation Sample</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample</td>
<td>69</td>
<td>5.48</td>
<td>3.75-6.75</td>
</tr>
<tr>
<td>Program 1</td>
<td>(13)</td>
<td>5.83</td>
<td>4.00-6.75</td>
</tr>
<tr>
<td>Program 2</td>
<td>(24)</td>
<td>5.60</td>
<td>4.00-6.75</td>
</tr>
<tr>
<td>Program 3</td>
<td>(15)</td>
<td>5.15</td>
<td>4.25-6.75</td>
</tr>
<tr>
<td>Program 4</td>
<td>(12)</td>
<td>5.29</td>
<td>3.75-6.25</td>
</tr>
<tr>
<td>Program 5</td>
<td>(5)</td>
<td>5.45</td>
<td>4.25-6.25</td>
</tr>
<tr>
<td>Performance Goal Orientation Sample</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample</td>
<td>69</td>
<td>5.41</td>
<td>3.25-7.00</td>
</tr>
<tr>
<td>Program 1</td>
<td>(13)</td>
<td>5.88</td>
<td>3.25-7.00</td>
</tr>
<tr>
<td>Program 2</td>
<td>(24)</td>
<td>5.28</td>
<td>3.25-7.00</td>
</tr>
<tr>
<td>Program 3</td>
<td>(15)</td>
<td>5.08</td>
<td>3.75-7.00</td>
</tr>
</tbody>
</table>
Table 6 (continued)

<table>
<thead>
<tr>
<th>Program 4</th>
<th></th>
<th></th>
<th></th>
<th>Program 5</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.72)</td>
<td></td>
<td></td>
<td></td>
<td>(1.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.75</td>
<td>4.50-6.75</td>
<td>(15)</td>
<td>5.88</td>
<td>4.50-6.75</td>
<td>(15)</td>
<td>5.70</td>
</tr>
<tr>
<td></td>
<td>4.50</td>
<td>-6.75</td>
<td></td>
<td>6.75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deep Processing</td>
<td>CLS</td>
<td>Sample</td>
<td>69</td>
<td>4.74</td>
<td>3.27-6.38</td>
<td>59</td>
<td>5.07</td>
</tr>
<tr>
<td>Program 1</td>
<td></td>
<td>13</td>
<td>4.87</td>
<td>3.65-5.92</td>
<td>(0.83)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 2</td>
<td></td>
<td>24</td>
<td>5.05</td>
<td>3.77-6.38</td>
<td>(0.69)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 3</td>
<td></td>
<td>(15)</td>
<td>4.58</td>
<td>3.54-6.19</td>
<td>(0.64)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 4</td>
<td></td>
<td>(11)</td>
<td>4.35</td>
<td>3.54-5.58</td>
<td>(0.59)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 5</td>
<td></td>
<td>6</td>
<td>4.30</td>
<td>3.27-5.69</td>
<td>(1.02)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface CLS</td>
<td></td>
<td>Sample</td>
<td>70</td>
<td>4.88</td>
<td>2.38-6.38</td>
<td>59</td>
<td>5.33</td>
</tr>
<tr>
<td>Program 1</td>
<td></td>
<td>12</td>
<td>5.36</td>
<td>4.38-6.25</td>
<td>(0.59)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 2</td>
<td></td>
<td>24</td>
<td>5.01</td>
<td>3.50-6.38</td>
<td>(0.77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 3</td>
<td></td>
<td>(15)</td>
<td>4.93</td>
<td>3.50-6.25</td>
<td>(0.85)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 4</td>
<td></td>
<td>(13)</td>
<td>4.51</td>
<td>3.38-6.13</td>
<td>(0.78)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 5</td>
<td></td>
<td>6</td>
<td>4.08</td>
<td>2.38-5.63</td>
<td>(1.10)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6 (continued)

<table>
<thead>
<tr>
<th>Sample</th>
<th>CPL</th>
<th>1-14</th>
<th>61</th>
<th>11.75</th>
<th>4-14</th>
<th>87</th>
<th>11.37</th>
<th>1-14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program 1</td>
<td>(13)</td>
<td>12.08</td>
<td>6-14</td>
<td>(17)</td>
<td>12.94</td>
<td>10-14</td>
<td>(12)</td>
<td>11.83</td>
</tr>
<tr>
<td>Program 2</td>
<td>(24)</td>
<td>10.92</td>
<td>3-14</td>
<td>(23)</td>
<td>12.00</td>
<td>8-14</td>
<td>(24)</td>
<td>12.58</td>
</tr>
<tr>
<td>Program 3</td>
<td>(15)</td>
<td>11.80</td>
<td>7-14</td>
<td>(5)</td>
<td>10.00</td>
<td>5-14</td>
<td>(11)</td>
<td>10.82</td>
</tr>
<tr>
<td>Program 4</td>
<td>(13)</td>
<td>11.23</td>
<td>1-14</td>
<td>(15)</td>
<td>10.53</td>
<td>4-14</td>
<td>(15)</td>
<td>11.20</td>
</tr>
<tr>
<td>Program 5</td>
<td>(6)</td>
<td>9.50</td>
<td>1-13</td>
<td>(1)</td>
<td>(25)</td>
<td>10.32</td>
<td>1-14</td>
<td></td>
</tr>
</tbody>
</table>

Note. The sample size corresponds to the number of students who responded at each time point. At Time 2 for Program 5, there were no descriptives because there was one respondent. CLS = cognitive learning strategies. CPL = plans for continued professional learning.

Further analyses included paired-sample $t$-tests and growth curve analyses to answer the nine research questions driving this investigation. ANOVA and the three-level growth curve analysis were not feasible because of the small number of participant programs. The research questions and results of the analyses to answer the questions are presented in the next section.

Results of Analyses for Research Questions

Instructional Practices (Research Question 1)

Only a descriptive report of the instructors’ responses to the scales for instructional practices could be used for this research question due to the small number of
instructors in the study. There were higher scores for the use of mastery instructional practices as compared to the scores for the performance instructional practices, but only one instructor had a score higher than the midpoint score for the use of mastery instructional practices scale. There were not enough instructors to make any further inferences from the data.

**Students’ Personal Goal Orientations and Use of Cognitive Learning Strategies at Time 1 (Research Questions 2 and 3)**

Paired-sample t-tests were used to assess the differences for mastery and performance goal orientations and the differences for deep processing and surface cognitive learning strategies at Time 1. The results are shown in Table 7. Exploratory paired-sample t-tests were used to examine the differences in means for the goal orientations, uses of cognitive learning strategies, and plans for continued professional learning between Time 1 and Time 2 and between Time 2 and Time 3. A more stringent constraint for significance was warranted for the paired-sample t-test procedures because of using multiple t-tests with a single sample. Because there were 16 paired-sample t-tests conducted, the α-level for significance was set at .003 for each paired-sample t-test. Cohen’s d was used to determine the effect size for each paired-sample t-test.

While the hypothesis was that students would enter the OTA program with a higher mean score for a performance than mastery goal orientation accompanied by the use of more surface than deep processing learning strategies, the average student entered with a slightly higher mean score for mastery goal orientation and a higher mean score for the use of surface cognitive learning strategies. There was only one significant
difference in means, and that was for the use of surface cognitive learning strategies between Time 1 and Time 2. More complete results are presented in the next sections.

Table 7

*Results of Paired-Sample t-test Analyses for Differences in Means for Goal Orientations, Use of Cognitive Learning Strategies, and Number of Plans for Continued Professional Learning*

<table>
<thead>
<tr>
<th>Variable (Time) - Variable (Time)</th>
<th>95% CI for Mean Difference</th>
<th>d</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mastery and Performance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal Orientations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mastery T1 - Performance T1</td>
<td>-0.18, 0.32</td>
<td>0.08</td>
<td>0.58</td>
<td>68</td>
</tr>
<tr>
<td>Mastery T2 - Performance T2</td>
<td>-0.15, 0.44</td>
<td>0.16</td>
<td>1.00</td>
<td>59</td>
</tr>
<tr>
<td>Mastery T3 - Performance T3</td>
<td>-0.27, 0.16</td>
<td>-0.06</td>
<td>-0.50</td>
<td>86</td>
</tr>
<tr>
<td>Mastery T1 - Mastery T2</td>
<td>-0.42, -0.00</td>
<td>-0.41</td>
<td>-2.05</td>
<td>45</td>
</tr>
<tr>
<td>Mastery T2 - Mastery T3</td>
<td>-0.16, 0.29</td>
<td>0.24</td>
<td>0.55</td>
<td>48</td>
</tr>
<tr>
<td>Performance T1 - Performance T2</td>
<td>-0.38, 0.12</td>
<td>-0.23</td>
<td>-0.01</td>
<td>45</td>
</tr>
<tr>
<td>Performance T2 - Performance T3</td>
<td>-0.11, 0.39</td>
<td>-0.01</td>
<td>1.14</td>
<td>48</td>
</tr>
<tr>
<td><strong>Use of Deep Processing and Surface Cognitive Learning Strategies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deep T1 - Surface T1</td>
<td>-0.37, 0.03</td>
<td>0.68</td>
<td>-1.71</td>
<td>67</td>
</tr>
<tr>
<td>Deep T2 - Surface T2</td>
<td>-0.05, -2.47</td>
<td>-0.33</td>
<td>-2.47</td>
<td>57</td>
</tr>
<tr>
<td>Deep T3 - Surface T3</td>
<td>-0.33, -0.04</td>
<td>-0.23</td>
<td>-2.55</td>
<td>83</td>
</tr>
<tr>
<td>Deep T1 - Deep T2</td>
<td>-0.42, -0.01</td>
<td>-0.44</td>
<td>-0.09</td>
<td>45</td>
</tr>
<tr>
<td>Deep T2 - Deep T3</td>
<td>-0.24, 0.09</td>
<td>0.06</td>
<td>-0.91</td>
<td>46</td>
</tr>
<tr>
<td>Surface T1 - Surface T2</td>
<td>-0.60, -0.13</td>
<td>-0.53</td>
<td>-3.14*</td>
<td>44</td>
</tr>
<tr>
<td>Surface T2 - Surface T3</td>
<td>-0.23, 0.16</td>
<td>0.16</td>
<td>-0.36</td>
<td>46</td>
</tr>
<tr>
<td><strong>Plans for Continued Professional Learning (CPL)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPL T1 - CPL T2</td>
<td>-1.20, 0.66</td>
<td>-0.40</td>
<td>-0.59</td>
<td>47</td>
</tr>
<tr>
<td>CPL T2 - CPL T3</td>
<td>-1.11, 0.35</td>
<td>0.46</td>
<td>-1.05</td>
<td>49</td>
</tr>
</tbody>
</table>

*Note.* T = time of assessment.

*p = .003.
Mastery and performance goal orientations at Time 1. As noted in Table 6, the sample at Time 1 had a higher mean for the mastery goal orientation ($M = 5.48$, $SD = 0.72$) than for the performance goal orientation ($M = 5.41$, $SD = 0.94$). The result of the paired-sample $t$-test analysis for mastery and performance goal orientations is shown in Table 7. There was no significant difference, on average, in the means for mastery and performance goal orientations at Time 1, $t(68) = 0.58$, $p > .003$, $d = 0.08$, 95% CI [-0.18, 0.32]. The means for students’ performance and mastery goal orientations for each program at Time 1 are presented graphically in Figure 1.

![Figure 1](image-url)

*Figure 1.* Means for students’ performance and mastery goal orientations in each program at Time 1.

Deep processing and surface cognitive learning strategy use at Time 1. The OTA students’ mean scores for the use of deep processing ($M = 4.74$, $SD = 0.76$) and surface ($M = 4.88$, $SD = 0.85$) cognitive learning strategies are presented in Table 6 and show a higher mean for the use of surface cognitive learning strategies. The paired-sample $t$-test (Table 7) indicated that there was not a significant difference in means at Time 1 for the use of deep processing and surface cognitive learning strategies, $t(67) = -1.71$, $p > .003$, $d = 0.68$, 95% CI [-0.15, 0.44]. The means for the students’ use of surface
and deep processing cognitive learning strategies in each program at Time 1 are presented graphically in Figure 2.

![Figure 2](image)

*Figure 2.* Means for students’ use of surface and deep processing cognitive learning strategies in each program at Time 1.

**Changes in Students’ Mastery and Performance Goal Orientations from Time 1 to Time 2 to Time 3 (Research Question 4)**

Changes in the mastery and performance goal orientation and the use of deep processing and surface cognitive learning strategies were examined using growth curve modeling. As explained more completely in the planned data analysis section of Chapter Three, growth curve analysis allows examination of “both intra-individual change and individual differences in the nature of that change” (McCoach & Kaniskan, 2010, p. 1). The equations for the unconditional within-student and between-student models used in this analysis are fully explained in Chapter Three methodology.

The within student variability is unique to each participant student. The between-student variability refers to variability between students in their goal orientations and cognitive learning strategies at Time 1 (intercept) and change in goal orientations and use
of cognitive learning strategies from Time 1 to Time 3 (slope). The results for changes in
goal orientations and use of cognitive learning strategies from Time 1 through Time 2 to
Time 3 analyses are presented in the next sections.

The unconditional within-student model of mastery goal orientation indicated a
moderate reliability of .50 for the intercept and a low reliability of .20 for the slope over
time. The results as shown for the unconditional model in Table 8 indicated that the
average intercept or mastery goal orientation was 5.51 and that there was a non-
significant increase over time. The within student variance was significant and due to
factors within individual students. The within-student variability accounted for 45% of
the total variance ($df$ 67, $\chi^2 = 130.45$). The variability in personal mastery goal orientation
among students at Time 1 was significant and accounted for 48% of the total variance.
There was no significant variability in the change for students’ mastery goal orientation
from Time 1 through Time 2 to Time 3; this accounted for only 7% of the total variance.
That is, students entered the program with varying levels of mastery goal orientation;
however, there was no significant variability among students in the extent to which
mastery goal orientation changed over time.

The unconditional within-student model of performance goal orientation indicated
a moderate reliability of .64 for the intercept and a low reliability of .20 for the slope. The
unconditional model results as presented in Table 8 showed that the average performance
goal orientation score at Time 1 was 5.46 and changed little over time. The within student
variance accounted for 45% of the total variance ($df$ 67, $\chi^2 = 155.90$). Almost all the
variability (89%) in performance goal orientation was at Time 1. As with the mastery
goal orientation, there was no significant variability in changes for the performance goal
orientation from Time 1 through Time 2 to Time 3 accounting for only 7% of the total variance. Again, these results are presented in Table 8 for the mastery and performance goal orientations.

Table 8

*Changes in Mastery and Performance Goal Orientations Over Time*

<table>
<thead>
<tr>
<th></th>
<th>Within student (unconditional) model</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mastery</td>
<td>Performance</td>
</tr>
<tr>
<td>Estimation of fixed effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average goal orientation (intercept)</td>
<td></td>
<td>5.51*</td>
<td>5.46*</td>
</tr>
<tr>
<td>Change in goal orientation</td>
<td></td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Estimation of random effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1: Within student variance for intercept ($\sigma^2$)</td>
<td></td>
<td>0.27</td>
<td>0.37</td>
</tr>
<tr>
<td>Level 2: Between-student variance for intercept ($\beta_0$)</td>
<td>$\chi^2$</td>
<td>130.45*</td>
<td>155.90*</td>
</tr>
<tr>
<td>Level 2: Between-student variance for slope ($\beta_1$)</td>
<td>$\chi^2$</td>
<td>72.79</td>
<td>80.34</td>
</tr>
<tr>
<td>Deviance statistic</td>
<td></td>
<td>482.51</td>
<td>565.14</td>
</tr>
</tbody>
</table>

*p < .001.

Changes in Use of Deep Processing and Surface Cognitive Learning Strategies With Mastery and Performance Goal Orientations as Predictors (Research Questions 5 and 7)

Growth curve analysis was utilized to examine if there was systematic change over time, that is, growth or decline in students use of deep processing and surface cognitive learning strategies use and desire for continued professional development from
Time 1 through Time 2 to Time 3. The planned analysis examining change in cognitive learning strategies with mastery and performance goals as time varying covariates was not conducted because, as demonstrated in the previous analysis, mastery and performance goals did not change significantly across the three time points. Instead students’ personal mastery and performance goals scores were averaged across the three time points and included as between-student predictors (labeled as MEANMAST and MEANPERF in the equations for the analyses, respectively) of the average level and change in students’ use of deep and surface processing cognitive learning strategies and plans for CPL. The general equations for these analysis are presented below:

Model 1 Level-1 unconditional linear growth model:

\[ Y_{it} = \pi_{0i} + \pi_{1i} \text{time} + e_{it} \]

where

\[ Y_{it} \] represents the dependent variables of the use of deep processing cognitive learning strategies, surface cognitive learning strategies, and plans for continued professional learning. Other definitions are included in Chapter Three growth curve analysis section.

Model-2: Linear growth in dependent variables with mastery and performance goal orientations as between-student predictors.

\[ \pi_{0i} = \beta_{10} + \beta_{01} \text{MEANMAST}_i + \beta_{02} \text{PERFMEAN}_i + r_{0i} \] and

\[ \pi_{1i} = \beta_{11} + \beta_{11} \text{MEANMAST}_i + \beta_{12} \text{PERFMEAN}_i + r_{1i}. \]

The final equation for the within and between student model is
\[ Y_{\text{Deep}it} = \beta_{00} + \beta_{01}(\text{MEANMAST}_i) + \beta_{02}(\text{PERFMEAN}_i) + r_{0i} + \beta_{11} + \beta_{11}(\text{MEANMAST}_i) + \beta_{12}(\text{PERFMEAN}_i) + r_{1i} + e_{it}. \]

**Changes in the use of deep processing cognitive learning strategies with personal goal orientation predictors.** The results for the unconditional within-student model 1 analysis of the use of deep processing cognitive learning strategies are shown in the first column of Table 9, with a moderate reliability estimate for the intercept of 0.63 and a poor reliability for the slope of 0.15. The average score for the use of deep processing cognitive learning strategies at Time 1 was 4.76 and increased significantly over time. The within student variability was significant and accounted for 34% of the total variance \((df 65, \chi^2 = 181.39)\). The variability among students at Time 1 for the use of deep processing cognitive learning strategies was significant and accounted for 62% of the total variance. There was no significant variability in the slope for the use of deep processing cognitive learning strategies from Time 1 through Time 2 to Time 3, and this accounted for only 4% of the total variance.

The results for the analysis of the relationships of mastery and performance goal orientations and the use of deep processing cognitive learning strategies are presented in models 2 and 3 in Table 9. The reliability estimates for the intercept of deep processing learning strategies as related to both mastery and performance goal orientations and as related to mastery goal orientation alone were moderate at 0.54 for the intercept and low at 0.13 for the slope.

Mastery and performance goal orientations were included as between student predictors of the intercept for students’ use of deep processing cognitive learning strategies (model 2, Table 9). The two predictors together accounted for 33% of the
variance in the use of deep processing cognitive learning strategies; however, only
mastery goal orientation was the significant predictor of these strategies. As performance
goal orientation was not a significant predictor, it was excluded from the analysis for the
sake of parsimony (in model 3, Table 9). As indicated in model 3, students’ mastery goal
orientation accounted for thirty-three percent (33%) of the variance in their use of deep
processing cognitive learning strategies over time.

These results indicated that having an increased mastery orientation is related to
an increased use of deep processing cognitive learning strategies. A performance goal
orientation was not related to the increased use of these same cognitive learning
strategies. About 33% of the variance among the students was related to the students’
mastery goal orientation. There was no significant variability in slope when mastery and
performance goal orientations and mastery goal orientation alone were included as
predictors. The use of surface cognitive learning strategies was evaluated next for a
relationship to students’ mastery and performance goal orientations.

Table 9

Changes in Use of Deep Processing Cognitive Learning Strategies Over Time With
Mastery and Performance Goal Orientations as Between-Student Predictors

<table>
<thead>
<tr>
<th>Deep Processing CLS</th>
<th>Model 1 Within student</th>
<th>Model 2 Mastery and Performance Predictors</th>
<th>Model 3 Mastery Predictor</th>
</tr>
</thead>
</table>

Estimation of fixed effects, $\beta$
Average use (SE) (intercept) 4.76 (0.08)**  4.75 (0.08)**  4.74 (0.08)**
Table 9 (continued)

<table>
<thead>
<tr>
<th>Between-student predictors of average use (intercept)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery GO (SE)</td>
</tr>
<tr>
<td>Performance GO (SE)</td>
</tr>
<tr>
<td>Change in use</td>
</tr>
</tbody>
</table>

Estimation of random effects, \( \pi \)

| Level 1: Within student variance (\( \sigma^2 \)) | 0.21 | 0.21 | 0.21 |
| Level 2: Between-student variance for intercept (\( \beta_{00} \)) | 0.39 | 0.26 | 0.26 |
| \( \chi^2 \) (df) | 181.39**(65) | 151.77**(63) | 153.90**(64) |
| Level 2: Between-student variance for slope (\( \beta_{0i} \)) | 0.02 | 0.02 | 0.02 |
| \( \chi^2 \) (df) | 75.55 (65) | 75.10 (63) | 76.17 (65) |

Deviance statistic | 451.96 | 410.09 | 399.00 |

Note. CLS = Cognitive learning strategies, GO = Goal orientation.
*\( p < .01 \). **\( p \leq .001 \).

Changes in surface cognitive learning strategies with personal goal orientations as predictors. The results for the unconditional within-student model 1 analysis for the use of surface cognitive learning strategies are shown in Table 10, with a moderate reliability of 0.66 for the intercept and a poor reliability of 0.04 for slope. The average score for the use of surface cognitive learning strategies at Time 1 was 4.97, and there was a non-significant increase over time. The within student variance significantly accounted for 31% of the total variance (\( df = 66, \chi^2 = 184.43 \)). The variability among students at Time 1 for the use of surface cognitive learning strategies significantly accounted for 68% of the total variance. There was no significant variability in the slope
for the use of surface cognitive learning strategies from Time 1 through Time 2 to Time 3, and it accounted for only 1% of the total variance.

The results of the analysis of the relationship of mastery and performance goal orientations and the use of surface cognitive learning strategies are presented in models 2 and 3 in Table 10. The reliability estimates for the intercepts were a moderate 0.67 in model 2 and a moderate 0.68 for model 3, and the reliability was a very low 0.04 for the slope in both models.

As seen in model 2, students’ mastery goals were significantly predictive of the use of surface cognitive learning strategies and non-significantly by a performance goal orientation. The two predictors significantly accounted for 45% of the variance in the use of surface cognitive learning strategies in the between-student model; however, the mastery goal was the only significant predictor. As performance goal orientation was not a significant predictor, it was excluded from the model 3 analysis for the sake of parsimony. In model 3, the mastery goal orientation explained a significant 43% of the variability in students’ use of surface cognitive learning strategies.

These results indicated that having an increased mastery goal orientation was related to an increased use of surface cognitive learning strategies. The performance goal orientation was not related to the increased use of these same cognitive learning strategies. About 44% of the variance among the students was related to the students’ mastery goal orientation. There was no significant variability in slope when mastery and performance goal orientations and mastery goal orientation alone were included as predictors. The next question proposed a relationship of performance and mastery goal orientations to the number of plans that students had for continued professional learning.
Table 10

*Changes in Use of Surface Cognitive Learning Strategies Over Time With Mastery and Performance Goal Orientations as Between-Student Predictors*

<table>
<thead>
<tr>
<th></th>
<th>Surface CLS</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1 Within student</td>
<td>Model 2 Mastery and Performance Predictors</td>
<td>Model 3 Mastery Predictor</td>
</tr>
<tr>
<td>Estimation of fixed effects, ( \beta )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average use (SE) (intercept)</td>
<td>4.97 (0.09)*</td>
<td>4.96 (0.09)*</td>
<td>4.95 (0.09)*</td>
</tr>
<tr>
<td>Between-student predictors of average use (intercept)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mastery GO (SE)</td>
<td>0.43 (0.12)*</td>
<td></td>
<td>0.48 (0.09)*</td>
</tr>
<tr>
<td>Performance GO (SE)</td>
<td>0.10 (0.12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in use</td>
<td>0.16 (0.04)*</td>
<td>0.16 (0.04)*</td>
<td>0.16 (0.04)*</td>
</tr>
</tbody>
</table>

Estimation of random effects, \( \pi \)

Level 1: Within student variance (\( \sigma^2 \)) 0.25 0.26 0.26

Level 2: Between-student variance for intercept (\( \beta_{0i} \))

\( \chi^2 \) (df) 184.43*(66) 350.56*(105) 373.19*(106)

Level 2: Between-student variance for slope (\( \beta_{1i} \))

\( \chi^2 \) (df) 62.14 (66)

Deviance statistic 473.38 454.57 450.95

Note. CLS = Cognitive learning strategies, GO = Goal orientation.
* \( p \leq .001 \).

Changes in Number of Plans for Continued Professional Learning With Mastery and Performance Goal Orientations as Predictors (Research Questions 6 and 8)

Students responded to statements about their plans for continued professional learning (CPL) after graduation, and each marked statement was scored as 1 plan. Across
all three times for the sample, the mean was 11.44 plans for CPL, with a standard deviation of 3.00. The descriptives for the number of CPL plans are presented in Table 6 for the sample and for each program at Times 1, 2, and 3.

The results of the growth curve model analyses of the relationship between personal goal orientation and plans for CPL are shown in Table 11. The reliability estimates for the intercepts for mean CPL plans within students was a moderate 0.63 in the within-student model 1 and a moderate 0.60 in models 2 and 3. The reliability estimate for the slope in the within-student unconditional model 1 was .32. Though it was significant, the variance for the slope in the within-student level-1 model (1.07) was so low in model 1 as to be considered not parsimonious for inclusion in models 2 and 3.

The results for the unconditional within-student model 1 analysis of the number of plans for CPL are shown in the first column of Table 11. The average number of plans for CPL was 11.17 and increased significantly over time. The within students variability was significant and accounted for 32% of the total variance ($df = 68, \chi^2 = 210.79$). The variability among students at Time 1 for the number of plans for CPL significantly accounted for 59% of the total variance. There was significant variability in the slope for the number of plans for CPL from Time 1 through Time 2 to Time 3, accounting for 9% of the total variance ($df = 68, \chi^2 = 103.19$).

The results for the analysis of the relationships of mastery and performance goal orientations and the plans for CPL are presented in models 2 and 3 in Table 11. Mastery and performance goals were included as between student predictors of the intercept the number of plans for CPL (model 2, Table 9). The two predictors together significantly accounted for 40% of the variance in the number of plans for CPL. However, only
mastery goal orientation was a significant predictor of the number of plans. As performance goal was not a significant predictor, it was excluded from the model 3 analysis for the sake of parsimony. As indicated in model 3 (Table 11), students’ mastery goal orientation accounted for 41% of the variance in the number of plans students had for CPL over time.

These results indicated that students enrolled in the OTA program with a fairly high number of plans for CPL and that number increased slightly on average over the first year of enrollment. The number of plans increased significantly when students had a mastery goal orientation but not when a performance goal orientation was included as a predictor for the number of CPL plans. About 40% of the variance among the students was related to the students’ mastery goal orientation. An increased mastery goal orientation was thus related to an increased number of plans for continued professional learning.

Table 11

*Changes in Number of Plans for Continued Professional Learning (CPL) Over Time With Mastery and Performance Goal Orientations as Between-Student Predictors*

<table>
<thead>
<tr>
<th></th>
<th>Plans for CPL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1 Within student</td>
</tr>
<tr>
<td><em>Estimation of fixed effects, β</em></td>
<td>11.17 (0.36)**</td>
</tr>
<tr>
<td>Average CPL plan numbers (SE)</td>
<td></td>
</tr>
</tbody>
</table>
Table 11 (continued)

<table>
<thead>
<tr>
<th>Between-student predictors of average use (intercept)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery GO (SE)</td>
<td>0.10 (0.37)*</td>
<td>0.94 (0.38)*</td>
</tr>
<tr>
<td>Performance GO (SE)</td>
<td>-0.03 (0.25)</td>
<td></td>
</tr>
<tr>
<td>Change in number of plans</td>
<td>0.17 (0.20)*</td>
<td>0.18 (0.20)</td>
</tr>
</tbody>
</table>

Estimation of random effects, π

<table>
<thead>
<tr>
<th>Level 1: Within student variance (σ²)</th>
<th>3.70</th>
<th>4.84</th>
<th>4.84</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 2: Between-student variance for intercept (β₀₀)</td>
<td>6.83</td>
<td>4.12</td>
<td>4.06</td>
</tr>
<tr>
<td>χ² (df)</td>
<td>210.79**(68)</td>
<td>281.37**(105)</td>
<td>281.06**(106)</td>
</tr>
<tr>
<td>Level 2: Between-student variance for slope (β₁₀)</td>
<td>1.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>χ² (df)</td>
<td>103.19*(68)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deviance statistic</td>
<td>1071.85</td>
<td>1068.50</td>
<td>1069.75</td>
</tr>
</tbody>
</table>

Note. GO = Goal orientation. *p < .05. ** p ≤ .001.

Relationship Between Instructional Practices and Changes in Students’ Personal Goal Orientations (Research Question 9)

Evaluation of the relationship between changes in students’ personal goal orientations and the mastery and performance instructional practices used in the classroom with growth curve analysis was intended but required a greater number than the five OTA programs that participated in this study. The instructors reported that they were more mastery focused in their instructional practices, but only one of the instructors had scores that were above the midpoint of 3.0 on the mastery scale. The students’ scores indicated that they used mastery and performance goal orientations almost equally at the start of the program, and this finding did not change significantly throughout the study.
period. Unfortunately, this question of the influence of instructional practices on the goal orientations of students could not be answered with the data that were gathered in this investigation.

Summary

The five OTA educational programs that agreed to participate in this longitudinal study were competitive in their admission practices, enrolling on average about 40% of applicants. Five instructors for the introductory OT class participated, and there were 108 students with usable responses. The response rates for students in the OTA programs across all three times ranged from 39% to 96%, with an overall response rate of 64%. Program 5 had only one student respondent at Time 2 which was a severe limitation to examination of differences in scores for goal orientations, use of cognitive learning strategies, and number of plans for continued professional learning at that assessment time. The program with the highest response rate had an instructor that offered service learning credit for completion of the surveys which was not solicited or suggested by the investigator.

Analyses of the instructors’ responses indicated that they tended to use more mastery and fewer performance instructional practices in the introductory OT class. Input from the instructors was sought at the beginning and end of the class, but only one instructor responded both times. There were not enough instructors to permit reliable statistical analyses for the data. The scores for the use of mastery instructional practices were close to the midpoint score of 3.0 for all the instructors, a finding that indicated that the use of mastery practices may not have been fully evaluated with the limited number of items on the survey or that there were flaws in the instrument. There was a general
tendency toward a greater use of mastery over performance instructional practices that could not be reliably substantiated in this investigation.

Evaluation of the students’ responses after participation in a competitive admissions process indicated that the new OTA students had no significant differences in mastery and performance goal orientations, though the mean for mastery goal orientation was slightly higher for the sample at the beginning and end of the first semester. After participation in an introductory OT class, the personal goal orientation means of students were examined with growth curve analyses for changes from Time 1 to Time 2 to Time 3. Using a growth curve analysis, students had significant variability in their scores for mastery goal orientation within students, or developmentally, and there was significance for the variances among the students’ scores at Time 1. Of the total variance in mastery goal orientation at Time 1, 48% of the variance was accounted for in the between-student model, and 45% of the total variance was within the individual students. Performance goal orientation mean scores were also significant for variability among the students and accounted for 89% of the total variance in performance goal orientation at Time 1. The variability within individual students was significant and accounted for 45% of the total variance. There was no significant variability among the students for performance goal orientation changes over time. On average, students entered the program with a slightly higher use of a mastery goal orientation than performance goal orientation, but the differences were not significantly different at any point in the study. There was little change in the goal orientations over time, so the OTA students could be characterized as having a multiple goals orientation for learning in the first year. The use of cognitive
learning strategies has been linked to one’s personal goal orientation and was also examined in the investigation.

The use of cognitive learning strategies was examined with growth curve model analyses. The variances among students for the use of deep processing cognitive learning strategies and within individual students at Time 1 were significant and accounted for 62% and 34% respectively of the total variance. There was no significant variability in the change over time for the use of deep processing cognitive learning strategies. Of the total variance for the average use of surface cognitive learning strategies at Time 1, 68% was accounted for between students and 31% within individual students, and both variances were significant. The variance in changes for the use of surface cognitive learning strategies over time was not significant. Students entered the OTA program with no significant differences in the use of surface and deep processing cognitive learning strategies. There was significant variability among and within students in the use of both categories of cognitive learning strategies but not for the variability in changes over time for the use of those strategies. Students seemed to use both deep processing and surface cognitive learning strategies fairly equally.

The plans that students had for continued professional learning (CPL) were examined with growth curve modeling analysis. The combined responses of students across all three time points yielded a mean number of 11.44 plans for CPL. Growth curve analyses revealed that the variances for the number of plans for CPL were significantly accounted for within and between students. Of the total variance for the average number of plans for CPL at Time 1, 59% was significantly accounted for by the variability among the students and 32% within individual students. Students entered the OTA program with
a robust number of plans for CPL and continued to have more plans as the first year progressed. The variability in the slopes was significant but small for the number of plans for CPL, accounting for 9% of the total variance.

The relationships between goal orientations and cognitive learning strategies used and plans for CPL were examined with growth curve analysis. Students’ mastery goal orientations were related significantly to the variances for the use of deep processing and surface cognitive learning strategies within and between students. The variability in the number of plans for CPL was significantly accounted for within and between students by their mastery goal orientation. The performance goal orientation did not have a significant impact on the use of deep processing or surface cognitive learning strategies or on the number of plans for CPL. Students with increased mastery goal orientations had a related higher number of plans for CPL and used more of both deep processing and surface cognitive learning strategies. The relationship between the use of both categories of cognitive learning strategies and a mastery goal orientation is different from findings in prior research studies with college students.

Examination between the OTA programs was intended with ANOVA and a third level of the multilevel regression analyses using growth curve modeling. However, there was a small number of participating programs, and the reasonable validity of program comparisons could not be accomplished with the small sample of OTA programs. A more complete discussion of all the results is presented in Chapter Five.
Chapter Five

Discussion

The purpose of this study was to explore the mastery and performance goal orientations of new occupational therapy assistant (OTA) students after participation in a highly competitive enrollment process and the relationships between any changes in their personal goal orientations, use of related cognitive learning strategies, and plans for continued professional learning (CPL) over time. In addition, the study sought to evaluate any relationships between mastery and performance instructional practices on the students’ personal goal orientations. The implications of mastery and performance goal orientations on the pursuit of learning have been documented in the past with college students, particularly those in introductory psychology classes (Barron & Harackiewicz, 2003; Ertmer et al., 1996). In a few studies about goal orientations, other students who participated in competitive admission processes such as those for nursing and pharmacy programs were enrolled in large lecture settings and were subjects for a one-semester study (Carroll & Garavalia, 2004; Salamonson et al., 2009). This investigational population of OTA students was anticipated to be unique in facing a competitive admission process and a cohort structure in which the students take all their professional classes of typically thirty or fewer students together from the onset of the curriculum. In addition, many instructors in professional educational programs are drawn from the clinic and may have limited education about motivational instructional practices that focus on student self-improvement and less on achievement of grades (Dempsey, 2007; Leonardelli & Gratz, 1986; Mitcham & Gillette, 1999). One focus of occupational therapy education is to develop lifelong learners who will continue learning for self-
improvement, for the advancement of professional knowledge, and for the benefit of the consumers of occupational therapy (ACOTE, 2011). This professional educational goal is aligned with the mastery goal orientation in achievement goal theory.

Achievement goal theory proposes social-cognitive reasons for students’ participation and goals for engaging in tasks or behaviors in achievement settings (Ames & Archer, 1988; Ertmer et al., 1996). Mastery goal orientations are associated with learning for self-improvement, for the challenge of participation in a task, and with an enjoyment in the process of learning (Dweck, 1986; Ertmer et al., 1996; Harackiewicz et al., 1997). Students with mastery goal orientations are more self-directed and tend to use more deep processing cognitive learning strategies to organize and elaborate on the learning task at hand while critically thinking about the implications of that current task as related to past and future learning (Elliot et al., 1999; Meece et al., 1988). Performance goal orientations are associated with demonstrating ability through grade achievement and avoiding an appearance of being less able than others (Ames & Archer, 1988; Harackiewicz et al., 1997). Students with performance goal orientations are focused on comparisons of themselves with others’ achievement and recognition, and they tend to use more surface cognitive learning strategies such as memorization and rote recall of facts (Elliot & McGregor, 2001; Meece et al., 1988). While continued professional learning (CPL) is required by some state licensure boards to maintain one’s license as an OTA, effort and self-direction is implied with plans to further one’s professional knowledge through active participation in self-guided education and interactive conferences that often require an investment of personal money and time. The professional ethos for CPL is initially discussed in an introductory OT class that occurs
after a competitive application process and enrollment in some OTA programs. The instructional methods in the introductory class may influence students to adopt a mastery goal orientation that would benefit self-directed plans for continued professional learning.

Studies have shown that the adoption of students’ personal goal orientations toward learning can be influenced by instructional practices in the classroom (Butler & Shibaz, 2008; Kumar & Maehr, 2007; Lawson, 2014; Retelsdorf & Günther, 2011). The instructional practices in a classroom may be mastery and/or performance focused, and these practices inform students about the teacher’s definition of academic success (Kumar & Maehr, 2007; Retelsdorf & Günther, 2011). Mastery instructional practices include a constellation of activities that encourage students’ intrapersonal comparisons of intellectual development through effort and engagement in learning tasks; these practices have been found to influence students to adopt mastery goal orientations for learning (Kumar & Maehr, 2007; Retelsdorf et al., 2010). Performance instructional practices include a constellation of activities that emphasize students’ interpersonal comparisons of knowledge achievement and encourage students’ adoption of performance goal orientations (Kumar & Maehr).

This longitudinal investigatory study incorporated data from surveys of instructors and OTA students in Midwestern OTA programs. The programs that were recruited offered the introductory OT class after the students completed a competitive admission process. Instructors were surveyed about their use of mastery and performance instructional practices in the class. OTA students were asked to complete surveys at the beginning and end of the introductory OT class and again in the next semester. The data
from these surveys were analyzed with descriptive statistics, paired-sample t-tests, and two-level regression analysis with growth curve modeling procedures.

Five accredited OTA programs agreed to participate in the investigation. The five instructors all responded to surveys at least one time. Student response rates ranged from 39-53% with an overall rate of 64%, and there were 108 students from the five OTA programs whose data were usable for analyses. A brief review of the findings about the instructors and students is presented in the next section.

**Major Findings**

The five instructors for the introductory OT class were found to have higher scores for the use of mastery instructional practices and lower scores for the use of performance instructional practices in the class. However, the scores for mastery instructional practices were close to the midpoint of 3.0 on the Likert response scale for the items. The small number of instructors in the investigation prohibited meaningful statistical analysis of differences in the instructional practices and provided a significant limitation in any generalization of this finding.

Newly enrolled OTA students who had participated in the highly competitive admission to the programs were found to have no significant difference between means for mastery and performance goal orientations at Time 1, though the mean for mastery goal orientation was slightly higher than that for performance goal orientation. The students did not have any significant difference between the means for the use of surface and deep processing cognitive learning strategies at Time 1. Students had a robust number (M =11.37) of plans for CPL at the Time 1. The changes over time for personal
goal orientations, the use of cognitive learning strategies, and plans for CPL were evaluated next.

Mastery and performance goal orientations from Time 1 to Time 2 to Time 3 were examined with growth curve model analyses. Of the total variances found in growth curve analyses for mastery goal orientation at Time 1, 45% was accounted for significantly by within student variances and 48% by between-student variances. Further analysis revealed that there was significance for the within-student variances accounting for 45% of the total variance and among the students accounting for 89% of the variance in average performance goal orientation at Time 1. There was no significant variability within- or between-students for changes in the mastery and performance goal orientations over time. The use of deep processing and surface cognitive learning strategies and the students’ plans for continued professional learning were examined next.

Growth curve model analyses revealed some significant variability in the use of deep processing and surface cognitive learning strategies and the number of plans for continued professional learning over time. Of the total variance for the use of deep processing cognitive learning strategies, there was 34% of the total variance significantly accounted for within-students and 62% between students. There was also significant variance for the use of surface cognitive learning strategies scores, with 31% of the total variance accounted for within-students and 68% by the between-student model. There were no significant variances in the slope for the use of deep processing and surface cognitive learning strategies. The total variance for the number of CPL plans on average was significantly accounted for by 32% within individual students and 59 % between-students. There was significant variance for the change in the number of CPL plans over
time accounting for 9% of the total variance. Further examinations were conducted to determine the relationships between personal goal orientations and the use of cognitive learning strategies and students’ number of plans for CPL.

An examination of the changes over time for the plans for CPL and the use of cognitive learning strategies with personal goal orientations as predictors of those changes. There was significant variability in the use of cognitive learning strategies and plans for CPL within-students and between-students when the student had a mastery goal orientation. When students had an increased mastery goal orientation, they tended to use more surface and deep processing cognitive learning strategies and had more plans for continued professional learning. Students with mastery goal orientations used more of both deep processing and surface cognitive learning strategies over time. There was no relationship between the variance in mastery goal orientation and the slope for the use of cognitive learning strategies and for the number of CPL plans. The inclusion of performance goal orientation as a parameter did not contribute to an explanation of the variances for the use of cognitive learning strategies and plans for continued professional learning.

There were limitations to the findings in this study. There were not enough OTA programs in the study to permit a third level of growth curve analysis to evaluate differences in goal orientations, use of cognitive learning strategies, and plans for CPL among the schools. The instructors in the OTA programs had limited differences in the use of performance and mastery instructional practices that made it difficult to classify a program as being higher in mastery or performance instruction for comparison of the schools with ANOVA. The comparison of instructors’ scores for the use of mastery and
performance instructional practices was not statistically feasible with the limited number of instructors. In addition, there was only one respondent from one of the OTA programs at the end of the first semester, Time 2, which was a limitation in generalizing other findings about personal goal orientations, use of cognitive learning strategies and plans for CPL. Additional discussion of the results and associated research hypotheses is presented in the next section.

Discussion of Results

In this section, the research hypotheses were examined through the findings noted previously. Some hypotheses were grouped to facilitate discussion of the results. Limitations and future research possibilities are noted in this section.

Instructional Practices

The first research hypothesis was that instructors would be more performance than mastery focused in their instructional practices because of limited education about the influence of instructional practices on students’ personal goal orientations and due to instructors’ emphasis on grades (Crist, 1999; Dempsey, 2007). All five instructors in the OTA programs were found to be more mastery-focused than performance-focused in their instructional practices using the items about mastery and performance approaches to instruction from the PALS (Midgley, 2000). This result could not be validated statistically and was in contradiction to the research hypothesis. There were no qualitative questions for instructors in the surveys that could further validate or dispute this hypothesis. Qualitative information from the instructors would have been helpful to determine whether the instructors had any education in motivational goal orientations, particularly about achievement goal theory and the influence of instructional practices on
students’ goal adoption. Many occupational therapy instructors come from the clinic to
the classroom with knowledge of motivating clients for therapy and OT students during
fieldwork in the clinic. Engaging a classroom of students with instructional practices that
enhance the adoption of mastery goal orientations may come with experience and through
educational programs that may not be provided by the institution supporting the OTA
program. However, the small number of instructors included in the investigation indicates
that generalization of a finding that instructors in OTA programs used more mastery-
focused instructional practices and the rejection of the research hypothesis suggesting
that instructors would likely be more performance-focused in their instructional practices
should be interpreted with great caution.

Goal Orientations and Use of Cognitive Learning Strategies

Mastery and performance goal orientations. The second research hypothesis
was that OTA students were likely to have higher mean scores for performance than
mastery goal orientation immediately after participation in a highly competitive
admission process, and the research hypothesis for research question four anticipated that
students were likely to continue that growth in the performance goal orientation during
the first year in the OTA program. The OTA program admission committees often rely
on initial screening of applicants using the student’s prior grade point average to sort
through the typically high volume of applications (Auriemma, 2007). The competitive
admission was anticipated to be significantly related to a performance goal orientation
which in turn is associated with an emphasis on high grade attainment and would thus
facilitate acceptance to the OTA program. However, the OTA students who participated
in this investigation entered the program with a slightly higher mean for the mastery goal
orientation shortly after admission though there was not a significant difference between the means for mastery and performance goal orientations. There was a large amount of variability between the students at Time 1 for performance goal orientation, which indicated that there were some students with very high scores and some with very low score around the predicted mean score for the sample. There was no significant variability in changes over time for mastery and performance goal orientations which indicated stability in the goal orientations. These OTA students may be similar in their adoption of both goal orientations when compared with prior studies’ samples of college students (Barron & Harackiewicz, 2003; Dishon-Berkovits, 2014; Pintrich, 1999), an approach which might help the OTA students to continue learning in the future on their own while attending to the requirements for maintenance of licensure as an OTA professional. Comparison of OTA students in several cohort groups over a longer period of time and through the certification exam would yield more rich findings. An investigation of the goal orientations of the students who dropped out or failed out might provide useful findings to guide the OTA programs’ admission criteria and benefit the search for the best students. A study which included OT students who are educated at the master’s and doctorate levels could determine whether those students also adopt multiple goal orientations for learning. The next research hypothesis proposed that students would use more surface cognitive learning strategies than deep processing cognitive learning strategies after admission because of hypothesized higher performance goal orientations.

**Use of cognitive learning strategies.** The hypotheses for research questions three and five predicted that students would enter the OTA program using more surface than deep processing cognitive learning strategies and would continue to rely on the use of
those surface cognitive learning strategies over the first year in the program. Prior studies showed that students with performance goal orientations tend to use more surface cognitive learning strategies and that students with mastery goal orientations tend to use more deep processing cognitive learning strategies (Barron & Harackiewicz, 2003; Elliot, et al., 1999). However, the OTA students in this study had nearly equal use of surface and deep processing cognitive learning strategies at every time point. The variability within individual students accounted for 34% of the total variance for the use of deep processing and 31% of the total variance for the use of surface cognitive learning strategies. The variability among the students’ for the use of cognitive learning strategies at Time 1 was 62% for deep processing and 68% for surface strategies. The changes in those scores over time were fairly consistent, and there was no significant variability for the slopes of the scores between the students for the use of each of the cognitive learning strategy categories. The similarity in the use of deep processing and surface cognitive learning strategies may have served the student well for getting grades that were strong enough for admission while still allowing engagement in the application of the knowledge for the future practice of occupational therapy. The OTA students may have found a balance, for example, in a memorization process for learning that satisfied learning some of the basic science facts such as bone structure in anatomy while elaborating on that knowledge for application to the treatment activities observed in the clinical setting. The professional education of OTA students requires a balanced and comprehensive knowledge of the human condition of the clients, whether that condition impacts daily life through the consequent physical dysfunction when the patient has a newly fractured hand or the psychological challenges when the person has a chronic mental illness. The OTA
students in this study seemed to demonstrate balanced scores for the mastery and performance goal orientations and use of deep processing and surface cognitive learning strategies in their first year in the OTA program.

Self-awareness of one’s current skill and knowledge levels is associated with deep processing cognitive learning strategies. The question that seemed to follow from the students’ consistent use of both deep processing and surface cognitive learning strategies was whether students were cognizant of the need to continue learning after their completion of an OTA program.

**Plans for Continued Professional Learning (CPL)**

The research hypotheses associated with question six proposed that students would enter the OTA program with a low number of plans for continued professional learning and that the number of plans for CPL would increase after participation in the first-semester class introducing students to the ethos of continued learning after graduation. The items describing plans for continued professional learning assessed options from doing the minimum required to maintain one’s license to a much more costly self-payment for attending the professional national conference. The initial survey of students yielded a robust number of plans and a higher, though not significantly different, mean number of CPL plans at the end of the introductory course. The number of plans dropped off somewhat in the next semester, but the differences in means again were not significant. The students seemed to be eager about continuing their education after graduation or were at least aware of the requirements for CPL, bringing into question whether students were marking many plans to appear enthusiastic to the investigator or were clueless about the personal efforts and costs involved with many of
the CPL plan options. At Time 1, two programs had a student who marked only one plan for CPL, and two programs had a student marking only three CPL plans. However, 54 of the students responding at Time 1 (76% of the total) had 10 or more plans for CPL. By the end of the first semester, the average number of CPL plans increased, and 79% of the respondents had 10 or more CPL plans; there were no students reporting fewer than four plans for CPL at that time. Shortly after the Time 2 assessment, advertising for the upcoming national OT conference announced the registration costs and hotel information which could easily entail over $500 in expenses for a student who attended all four days of the conference. This might have led some students to consider fewer plans to participate in continued learning especially at their own expense. However, at the third assessment in the second semester, the mean number of CPL plans decreased only slightly from 11.75 plans at Time 2 to 11.37 plans, and 78% of the students at Time 3 had 10 or more CPL plans. There was a decreased number of CPL plans, but it was not a significant drop. There was one program at Time 3 that had a student with one plan and a student with two plans. The most interesting findings seemed to be those from the growth curve analyses.

The growth curve model analyses provided insight into the variability in students’ number of plans for CPL within and among students and the variability in changes in the number of plans over time. There was significant variability within individual students and between students accounting for 32% and 59% of the total variance, respectively. The variability in the slope for the number of plans accounted significantly for only 9% of the total variance. These results indicated that the slope for the number of CPL plans was the only one in the study that had significant variability between the students. This
may be in line with the variability of students who are admitted to the OTA program. However, no data were collected from the students for this study about the prior educational or employment history or prior knowledge about the practice of OT, and that data may have informed a clearer analysis of the variability between the students. If students entered the OTA program after earning an associate or bachelor’s degree and had been working for some time, these students might have a greater appreciation of the benefits of continued professional learning to maintain or advance one’s career. Life experience and work experience have been identified as factors for some students returning to school and seeking an OTA degree. There may be a significant correlation or relationship of work and educational history and plans for CPL. Collection of work and educational history data could provide insight in future studies about the students’ plans for CPL. The relationships of mastery and performance goal orientations and the use of cognitive learning strategies and plans for continued professional learning are discussed next.

**Relationships of Goal Orientations and Use of Cognitive Learning Strategies and Continued Professional Learning Plans**

The study hypothesis seven predicted that students’ increased mastery goal orientation would be associated with an increased use of deep processing and decreased use of surface cognitive learning strategies and, conversely, that an increased performance goal orientation would be associated with an increased use of surface and decreased use of deep processing cognitive learning strategies. As noted previously, the students’ personal goal orientations have been linked with the use of cognitive learning strategies in the literature (Barron & Harackiewicz, 2000; Elliot et al., 1999; Pintrich &
DeGroot, 1990). However, the findings in this investigation were somewhat different than those of previous research. Performance goal orientation did not significantly predict variability in the use of either deep processing or surface cognitive learning strategies over time. As in prior studies, the study demonstrated that when students endorse mastery goals they are more likely to engage in learning strategies such as elaboration and thinking critically about the material learned. They are also likely to be more persistent when engaged in difficult learning tasks. Contrary to expectations, endorsement of mastery goals was also associated with increased use of surface cognitive learning strategies such as rote memorization of facts. These findings are not aligned with findings in other studies (Elliot et al., 1999; Meece, et al., 1988). However, it does raise the question regarding the benefits for the use of both categories of cognitive learning strategies for the OTA student with a mastery goal orientation. A multi-cohort and longer longitudinal study is needed to find replication of these results and whether the use of multiple goals orientation and the use of both deep processing and surface cognitive learning strategies are linked with positive rates for graduation and passing the certification exam. The next question was whether personal goal orientation would predict the number of CPL plans over time.

The hypothesis eight for this study was that a mastery goal orientation would be predictive of an increased numbers of CPL plans over time and that a performance goal orientation would be associated with decreased numbers of CPL plans over time. This investigator anticipated that students with mastery goal orientations would be more self-directed in their plans for learning and would seek as many opportunities as possible for continued learning in the future. The investigator also expected that students with
performance goal orientations would plan to do only the minimal CPL required to maintain licensure and would not be willing to make self-directed efforts to expand their knowledge about OT practice wherever and whenever possible. The findings indicated that an increased number of CPL plans was significantly predicted by the students’ mastery goal orientation both within- and between-students. The performance goal orientation predictor was not a significant predictor for the number of CPL plans that students chose at Time 1 or in the change in the number of plans selected from Time 1 to Time 2 to Time 3. These results provided evidence for the beneficial effect of mastery goal orientation on students’ plans for continued professional learning. However, more information might have been garnered from students if open-ended questions permitted identification of alternative CPL plans. Furthermore, it is possible that students’ plans for employment location are correlated to the number of plans for continued professional learning, as some states such as Pennsylvania do not require ongoing CPL for OTAs to maintain their state licensure after the initial approval for practice. The next hypothesis proposed a link between instructional practices and students’ goal orientations.

**Relationship Between Instructional Practices and Students’ Goal Orientations**

The final hypothesis for this investigation proposed relationships of mastery and performance instructional practices and students’ mastery and performance goal orientations. The use of mastery instructional practices in the classroom has been linked with increased mastery goal orientation and decreased performance goal orientation in students, while performance instructional practices have been related to increased students’ performance goal orientations and decreased mastery goal orientations (Muis & Edwards, 2009; Retelsdorf et al., 2010). The number of participating OTA instructors
was very low and too few in number for adequate comparison of the results. The five instructors did seem to favor mastery instructional practices, but their scores were very close to the midpoint score. The use of mastery instructional practices seemed to be supported by the accreditation standards for the OTA educational program (ACOTE, 2011), but the items on the scales used in this study were very limited in nature. Some of the wording of the items was altered to fit the college teaching environment more appropriately and may have affected the results. There are increasing numbers and formats for teaching at the college level, and a clear identification of these methods as either mastery or performance focused would be useful in research using the theoretical framework of the achievement goal theory. An assessment of the mastery and performance focus of these newer instructional methods could facilitate a more complete evaluation of the influence on students’ personal goal orientations. In addition, teachers who were informed about the effects of their instructional practices could use that knowledge to increase the mastery goal orientations and lifelong learning among their OTA students. The conclusions drawn from all these findings are discussed in the next section.

**Conclusions**

One purpose of this longitudinal investigation was to explore whether occupational therapy assistant (OTA) students who participated in a highly competitive admission process would enter their educational programs with higher performance and lower mastery goal orientations and would subsequently use more surface cognitive learning strategies that are associated with performance goal orientations. Another purpose was to investigate the use of cognitive learning strategies and plans for continued
professional learning (CPL) and any relationship with students’ personal goal orientations. A final purpose of the study was to examine changes in students’ personal goal orientations, the related use of cognitive learning strategies, and plans for continued professional learning after admission, particularly after participation in an introductory class presenting the tenets of the profession for lifelong learning.

The OTA students entered the educational program with slightly higher mean scores for mastery goal orientations than performance goal orientations. The lack of significance between the means of those goal orientations indicated that the students used both goal orientations without strong preference. For both goal orientations, there was significant variability within the students which indicated that each student’s background contributed to the differences for mastery and performance goals, but the changes over time for the individual did not vary significantly from the changes of all the students. There was also significant variability among the students for both goal orientations which indicated that students were different from one another in their level of mastery and performance goal orientations upon admission to the OTA program. The nearly equal mastery and performance goal orientation means for the sample indicated that the OTA students have adopted a multiple goals approach to learning. Barron and Harackiewicz (2000) noted that students who have adopted multiple goals increased their interest in the subject while working to get good grades in their class. This approach could benefit OTA students in becoming more interested in the wide-ranging and ever increasing practice activities and settings for the profession while maintaining a necessary grade point average to complete the academic course of study. While the accreditation standards support the development of lifelong learners in the educational program, awareness of the
multiple goals approach might encourage educators to focus on learning activities that will encourage a stronger adoption of a multiple goals orientation for learning.

The use of deep processing and surface cognitive learning strategies is associated with mastery and performance goal orientations respectively. For this sample, there was no significant difference between the average use of deep processing and surface cognitive learning strategies which may be aligned with multiple goals orientation. Unlike prior studies, a mastery goal orientation in this sample was a positive predictor for the use of both deep processing and surface cognitive learning strategies. A clear understanding of the instructional practices and activities in the classroom was not possible in this study, and the use of both types of cognitive learning strategies may have been linked to the classroom instructional milieu. Further study is recommended to more fully evaluate the use of deep processing and surface cognitive learning strategies among OTA students.

This sample of students entered the OTA programs with a fairly large number of plans for continued professional learning. Prospective students are expected to participate in observation of occupational therapy professionals prior to application for admission. The cooperating therapists for those observations usually discuss the types of diagnoses encountered during work as an OT and the types of settings in which one might work. Some OT professionals may mention the need for continued professional learning after completion of one’s degree program or as a requirement in some states for maintaining licensure. However, for some students the educational program in its introductory OT class provides the first information about learning after graduation and the requirements for continued licensure. Indeed, continued professional learning is a requirement for OTA
professionals in the state of Ohio but not in the state of Pennsylvania, the two states with OTA programs participating in this study. Nonetheless, students had many plans for CPL at the onset and had increased numbers of plans at the end of the introductory class. The number did drop in the next semester and, though there were no qualitative data to explain the phenomenon, the average number of plans chosen by students was still higher than at the start of the first semester. A characteristic of personal interest in the process of learning that is associated with the mastery goal orientation may have contributed to the significant finding for the relationship of that goal orientation and continued professional learning plans.

The small number of participating OTA programs limited evaluation of two research questions in this investigation. There were too few instructors to tie the use of mastery or performance instructional practices to changes in students’ goal orientations. In addition, the low number of participant OTA programs prevented a third level of the multilevel regression analysis to determine whether the instructional practices influenced the students’ adoption of increased mastery or performance goal orientations. These were significant limitations for this study.

**Recommendations**

While the highly competitive nature of the admission to the OTA educational program could lead one to speculate that the incoming students would be more focused on achieving high grades, a pattern of motivation typically associated with performance goal orientations and the use of surface cognitive learning strategies, the OTA students in this study were unlike the hypothesized model. The students entered and generally maintained nearly equal use of mastery and performance goal orientations. With higher
mastery goal orientations in the OTA students, the students used both deep processing and surface cognitive learning strategies. The confounding relationship of a mastery goal orientation and the use of surface cognitive learning strategies warrants attention in future investigations. If additional research confirms the findings of this study, the pedagogical preparation of new and existing occupational therapy faculty may focus on understanding multiple goal orientations while recognizing the beneficial influence of a mastery goal orientation on increased use of deep processing cognitive learning strategies. Further research may identify and contribute to alteration of factors contributing to the paralleled increase in the use of surface cognitive learning strategies.

The faculty in OTA programs should be aware that students do enter the program with ideas about continued professional learning (CPL) from the beginning. However, a mixed quantitative and qualitative investigation might provide more clarity about the students’ plans. The creativity of the students about plans for CPL may have been limited by the finite items presented in the scale used in this study. The instructors in OTA programs may encourage discussion of existing CPL ideas and facilitate creative methods to promote continued professional learning. When students become aware of the multiple means for participating in continued professional learning, the post-graduate professional is more likely to engage in non-repetitive learning activities that do not expand knowledge or enhance professional practice activities. In addition, a comparison of the plans for CPL under consideration or desired by OTA and OT students would be of interest to companies providing workshops and to planning committees for state and national conferences which attempt to address the needs of professional OTAs and OTs.
The limited number of programs participating in this investigation has constrained the comparison of OTA students’ changes in goal orientations, use of cognitive learning strategies, and CPL plans at the school level. With more information about the actual practices and activities in the classroom, a better comparison of the influence of instructional practices in the OTA classroom on students’ goal orientations could be accomplished and could provide instructors with more compelling data about the effectiveness of mastery instructional practices. A larger study conducted over two or more years with multiple student cohorts could also provide data that to explain or contradict this study’s finding of student engagement in both mastery and performance goal orientations over time. If a multiple goals orientation is evident among students in many OTA educational programs, that goal orientation for learning could be linked to academic achievement, program completion rates, and success on the national certification examination. The same could be shown for the students’ use of both deep processing and surface cognitive learning strategies. A further comparison of OTA students with other midlevel health professional students such as physical therapy assistant and radiology technician students might indicate similar or contrasting findings and influence all educational programs for midlevel health professionals. Much was learned in this investigation, but Pandora’s Box has been opened, and there is a potential to address goal orientations, use of cognitive learning strategies and plans for continued professional learning with OTA and other students in future studies.

**Summary**

This investigation provided evidence that occupational therapy assistant students did not differ greatly in their mastery and performance goal orientations upon admission.
In addition, the students generally used deep processing and surface cognitive learning strategies almost equally. Growth curve analyses revealed that a mastery goal orientation was linked with the use of both deep processing and surface cognitive learning strategies and additionally the number of plans for continued professional learning. The students seemed to be aware of the need for CPL and indeed appeared to have many plans for accomplishing continued professional learning from the onset of the OTA program and into the second semester.

Occupational therapy educators may benefit from knowing about their students’ personal goal orientations for learning and cognitive learning strategies upon the students admission to the program. Instructors could encourage a multiple goals approach to learning while understanding that students used both deep processing and surface cognitive learning strategies for learning. Students can be encouraged to explore a wide variety of continued professional learning. With further investigational studies, a more complete knowledge of students’ goal orientations, use of cognitive learning strategies, and plans for continued professional learning may contribute to the students’ successful completion of the program and preparation for practice as an occupational therapy assistant.
References


d28-14b3-4ff1-8552-c2045db263d0%40sessionmgr113&hid=123


Law, Y. (2011). The effects of cooperative learning on enhancing Hong Kong fifth graders' achievement goals, autonomous motivation, and reading proficiency.


doi: 10.1080/00313831003637972


Appendix A

Student Goal Orientations, Cognitive Learning Strategies, and

Plans for Continued Professional Learning Scales and Items
Mastery Goal Orientation Scale Items

- In a class like this, I prefer course material that really challenges me so I can learn new things.
- In a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn.
- The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.
- When I have the opportunity in this class, I choose course assignments that I can learn from even if they don’t guarantee a good grade.

Performance Goal Orientation Scale Items

- Getting a good grade in this class is the most satisfying thing for me right now.
- The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.
- If I can, I want to get better grades in this class than most of the other students.
- I want to do well in this class because it is important to show my ability to my family, friends, employer, or others.

Deep Processing Learning Strategies Scale Items

- When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions.
- I try to relate ideas in this class to those in other courses whenever possible.
- When reading for this class, I try to relate the material to what I already know.

- When I study for this course, I write brief summaries of the main ideas from the readings and my class notes.

- I try to understand the material in this class by making connections between the readings and the concepts from the lectures.

- I try to apply ideas from course readings in other class activities such as lecture and discussion.

- When I study the readings for this course, I outline the material to help me organize my thoughts.

- When I study for this course, I go through the readings and my class notes and try to find the most important ideas.

- I make simple charts, diagrams, or tables to help me organize course material.

- When I study for this course, I go over my class notes and make an outline of important concepts.

- I often find myself questioning things I hear or read in this course to decide if I find them convincing.

- When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.

- I treat the course material as a starting point and try to develop my own ideas about it.

- I try to play around with ideas of my own related to what I am learning in this course.
Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives.

When reading for this course, I make up questions to help focus my reading.

If course readings are difficult to understand, I change the way I read the material.

I work hard to do well in this class even if I don’t like what we are doing.

I ask myself questions to make sure I understand the material I have been studying in this class.

Even when course materials are dull and uninteresting, I manage to keep working until I finish.

When studying for this course, I often try to explain the material to a classmate or friend.

I try to work with other students from this class to complete the course assignments.

When studying for this course, I often set aside time to discuss course material with a group of students from the class.

When I become confused about something I’m reading for this class, I go back and try to figure it out.

When studying for this course, I try to determine which concepts I don’t understand well.

If I get confused taking notes in class, I make sure I sort it out afterwards.
Surface Learning Strategies Scale Items

- When I study for this class, I practice saying the material to myself over and over.
- When studying for this course, I read my class notes and the course readings over and over again.
- I memorize key words to remind me of important concepts in this class.
- I make lists of important items for this course and memorize the lists.
- Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone. (Reversed)
- I ask the instructor to clarify concepts I don’t understand well.
- When I can’t understand the material in this course, I ask another student in this class for help.
- I try to identify students in this class whom I can ask for help if necessary.

Plans for Continued Professional Learning Items

- I will do what my state licensing board requires for my OTA license
- I will do what NBCOT requires to maintain my COTA designation
- I will do what NBCOT requires to maintain my COTA designation only if work pays for it
- I will do what NBCOT requires to maintain my COTA designation on my own if I have to
- I will go to state OTA conference for continuing education
- I will go to state OTA conference for continuing education only if work pays for it
- I will go to state OTA conference for continuing education on my own if I have to
- I will go to national AOTA conference for continuing education
- I will go to national AOTA conference for continuing education only if work pays for it
- I will go to national AOTA conference for continuing education on my own if I have to
- I will participate in inservices as required at work
- I will ask for help/education from my co-workers or supervising OT
- I will read professional magazine/journal articles
- I will teach others about what I have learned at OTA school
Appendix B

Instructional Practices Scale Items

Mastery Instructional Practices Items

- I made a special effort to recognize students’ individual progress, even if they were below expected level.
- During class, I often provided several different activities so that students could choose among them.
- I considered how much students have improved when I gave them grades.
- I gave a wide range of assignments, matched to students’ needs and skill levels.

Performance Instructional Practices Items

- I gave special privileges to students who do the best work.
- I displayed the work of the highest achieving students as an example.
- I helped students understand how their performance compares to others.
- I pointed out those students who did well as a model for the other students.
- I encouraged students to compete with each other.