PROFESSORS' BELIEFS ABOUT STUDENT LEARNING

By

Jeffrey Robert Hart

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Committee:

John Habel _____ Co-Director

Bruce B. Henderson _____ Co-Director

Mary Jean R. Herzog _____

_____ Dean of the Graduate School

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Jeffrey Robert Hart

Co-Directors: John Habel, Ph.D.
Associate Professor of Psychology
Bruce Henderson, Ph.D.
Professor of Psychology
Department of Psychology

July 2005

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Abstract

PROFESSORS' BELIEFS ABOUT STUDENT LEARNING

Jeffrey R. Hart, M.A.

Western Carolina University (August 2005)

Co-Directors: Drs. John Habel and Bruce Henderson

This study is an exploratory qualitative study of college professors' beliefs about the psychological learning constructs of motivation, attention, memory, and learning strategies. I interviewed professors about their beliefs on these psychological learning constructs and interpreted their espoused beliefs and presented them in conceptual themes pertinent to the aforementioned constructs. I analyzed professor-submitted course syllabi for content to ascertain professors' beliefs about motivation, attention, memory, and learning strategies and also for evidence of how their beliefs about these learning constructs reflect in their practice of teaching.

Findings suggest most professors in the study espouse beliefs that support increasing intrinsic motivation in their students. However, some appear to attempt to increase motivation extrinsically. Syllabi analysis suggests professors' espoused beliefs about motivation are congruent with their practice, but not in every case. Most professors in the study appear to view attention as a cognitive construct that requires novelty and variety to be maintained. Some professors seem to encourage attention in their students through reinforcement. Many professors view memory as a cognitive construct that

requires students to actively reconstruct old knowledge and new knowledge for learning to occur. Finally, many professors in this study espouse beliefs that suggest students use a variety of learning strategies to engage with learning material—learning strategies that professors also attempt to capitalize on by structuring learning situations that promote and encourage students to use different learning strategies and styles they may find useful in learning.

Chapter I

Introduction

The purpose of this study is to describe professors' beliefs about the psychological learning constructs of motivation, attention, memory, and learning strategies. There have been a handful of research studies about professors' conceptions of learning (Bruce & Gerber, 1995; Gow & Kember, 1993; Prosser & Trigwell, 1999; Reid & Johnston, 1999; Samuelowicz & Bain, 2001), but they generally arrive at conclusions that discuss professors' beliefs about learning in terms of teaching methods or epistemological beliefs. Results are usually presented as beliefs, practices, or teaching methods that are described in terms of various dichotomies such as "behaviorist versus cognitive," "learning facilitation versus knowledge transmission," "constructivist versus behaviorist," and the like. While these studies have provided us with valuable information about teaching methods, pedagogy, and the epistemological beliefs of professors, these studies have suggested, but not fully explored, professors' beliefs about the psychological learning constructs that drive learning. With the exception of a qualitative study conducted by Cooper, Frommer, Gordon, and Nicholas (2002) about professors beliefs about memorization, there have been few, if any, substantive research endeavors about professors' beliefs about any of the psychological constructs of learning, such as motivation, attention, memory, and learning strategies.

A research study review conducted by Kane, Sandretto, and Heath (2002), who

entitled their study about teachers' conceptions of learning, "Telling Half the Story," suggests that prior studies about professors' conceptions of learning are limited because they do not examine professors' practice of teaching. It appears that not only do we know little about professors' beliefs about learning, but what we do know appears incomplete and may not reflect what professors actually do when they teach or why they teach the way they do. Thus, there is a clear gap in the research about professors' beliefs about the psychological constructs of learning.

The focus of this study is on college professors, many of whom are among the least educated of all teachers on matters of teaching and learning (Barr & Tagg, 1995). Barr and Tagg assert that the main reason for this irony is that many professors are not required to receive instruction about teaching and learning as they prepare for their professions; they are assumed to be competent as instructors because of their expertise in the field. Many professors are not exposed to teacher training and education and may not have had the opportunity when they were college students to learn about the psychological constructs that drive learning. Whether explicitly held or not, everyone has some beliefs about how learning occurs and about certain psychological constructs of learning. In the case of college professors, these beliefs most likely influence the way they teach and help their students learn. By describing professors' practiced and espoused beliefs about motivation, attention, memory, and learning strategies, it may be possible to better educate professors so that they may better educate their students.

Chapter II

Review of the Literature

In this chapter, I discuss the extant literature on professors' beliefs about student thinking and learning and what research says about the psychological constructs of motivation, attention, memory, and learning strategies. I discuss the extant literature about professors' beliefs about student learning to describe the findings of past research and suggest some limitations of what their findings offer. I discuss research about motivation, attention, memory, and learning strategies because they are vital components of student learning. Although these particular psychological components of learning have been the subject of many research studies, professors' beliefs about these components of learning are generally unknown and unexplored.

Studies about Professor and Teacher Thinking

There is not a wealth of research about professors' views on teaching and student learning. A handful of research studies have been conducted to explore professors' beliefs about teaching and student learning, with most of them presenting findings that describe professors' beliefs about learning and teaching along the lines of methodology and epistemology. Although sometimes interesting, these studies provide little information about how professors believe learning occurs. For the most part, these studies do not address the psychological constructs of learning, such as motivation, attention, memory, and the learning strategies students employ.

Prosser and Trigwell (1999) explain that professors' beliefs about teaching and learning may be categorized as supporting either knowledge transmission views or learning facilitation views. They relate learning facilitation to the constructivist paradigm of learning and teaching and relate knowledge transmission with the behaviorist paradigm. One can infer a relationship exists between these categorical descriptions and the psychological constructs of memory and motivation, although it was not the purpose of the research to explore that relationship. Prosser and Trigwell also discuss "deep" and "surface" approaches to learning. Students adopting a deep approach to learning aim to understand ideas, seek meaning, and try to relate new things to other things they know, while students who adopt a surface approach to learning may just try to cope with learning requirements they may view as being imposed on them (Prosser & Trigwell). These approaches have implications about how professors may believe memory and motivation influence learning. The research of Prosser and Trigwell suggests how professors think students learn, but it was not within the scope of their research to examine the professors' beliefs about the psychological constructs of learning their research alludes to.

Gow and Kember (1993) used interviews to examine professors' teaching methods and their assessment demands on students. Their research findings suggest two orientations to teaching a professor may utilize: learning facilitation and knowledge transmission. Gow and Kember also drew upon Saljo's research that described five conceptions of learning:

1. Learning as the quantitative increase in knowledge;

2. Learning as memorizing;
3. Learning as acquisition of facts, procedures, etc. which can be retained and/or utilized in practice;
4. Learning as the abstraction of meaning;
5. Learning as an interpretative process aimed at the understanding of reality. (as cited in Gow & Kember, p. 20).

Gow and Kember (1993) explain these conceptions can be grouped under two teaching orientations; the first three support the transmission of knowledge orientation and the second group support the learning facilitation orientation. Gow and Kember also report the first group of three conceptions is positively related to a surface approach to learning, which they describe students undertake by attempting to memorize what might appear in examinations based on notes taken from lectures. Glover, Ronning, and Bruning (1990) describe surface or "shallow" processing, as they term it, as "keying on superficial aspects of new material" (p. 106).

To Gow and Kember (1993), the learning facilitation orientation encourages students to utilize "deep and achieving" approaches. The researchers explain students use a deep approach in learning when they have an intrinsic interest in the material and a desire to search for personal meaning in the material to be learned. Glover et al. (1990) describe deep processing as "processing centered on meaning" (p. 106). Gow and Kember explain students who use an achieving approach express enthusiasm, a will to succeed and exhibit more motivation than students who adopt a surface approach, but

Gow and Kember also note students who use an achieving approach are less intrinsically motivated than students who use a deep approach.

The research of Gow and Kember (1993) offers categorical descriptions of professors' orientations to teaching and the influence a professor's orientation may have on the learning approaches students employ. The study also discusses how a professor's orientation may influence student motivation, but it was not within their scope to explore professors' beliefs about motivation or how motivation influences student learning. This is another example of research that suggests a professor's beliefs about psychological constructs, such as motivation, may influence student learning, but does not collect empirical evidence about their beliefs.

Bruce and Gerber (1995) attempted to uncover professors' conceptions of student learning and find professors' conceptions of student learning can be categorized in one of six ways:

1. Learning as the acquisition of knowledge through the use of study skills preparing for tasks.
2. Learning as the absorption of new knowledge the student can explain and find applications for its use.
3. Learning as the development of thinking skills combined with reasoning ability.
4. Learning as the development of beginning professional competencies.
5. Learning as reflected in the changing of a student's personal attitudes, beliefs, or behaviors.
6. Learning as participation in a pedagogic experience.

Bruce and Gerber (1995), explicitly state the six categories they describe are formulated "...in terms of three components: what learning is, how it is achieved, and how the accomplishment of learning is demonstrated" (p. 447). While the six categories have implications about student motivation, memory, and learning strategies, they did not attempt to discover professors' beliefs about them.

Samuelowicz and Bain (2001) undertook a research project utilizing interviews with professors to describe their orientations to teaching. Their questions focused on beliefs about teaching, beliefs about knowledge, beliefs about student learning, and beliefs about the links between teaching and learning. Samuelowicz and Bain presented their results as variants falling along a continuum between categories of knowledge transmission (teaching-centered) and learning facilitation (learning-centered) utilizing the following dimensions:

Teaching-centered Orientations:

- Imparting Information
- Transmitting structured knowledge
- Providing and facilitating understanding

Learning-centered Orientations:

- Helping students develop expertise
- Preventing misunderstandings
- Negotiating understanding
- Encouraging knowledge creation

Samuelowicz and Bain (2001) suggest the influence of a vast array of cognitive activities such as motivation, attention, memory, and learning styles on student learning but, again, examining professors' beliefs about these constructs or how those beliefs influence teaching and student learning were not within the scope of the study.

Reid and Johnston (1999) studied a group of university professors from England to discover concepts and elements of good teaching. Utilizing a survey and repertory grids administered to professors and students, Reid and Johnston (p. 274) categorize professors' beliefs about good teaching as falling under one of six areas:

- Approachability
- Clarity
- Depth
- Interaction
- Interest
- Organization

The study of Reid and Johnston (1999) is one of several in the extant literature that reflects a teacher-centered bias, in that it focuses on teaching methodology even though it utilizes input from students. It does not address learning and does not examine how professors influence learning or how professors believe learning occurs. It is one of many that essentially examine methodology and/or epistemology but do not address professors' beliefs about the psychological constructs of learning and how those beliefs influence and reflect their teaching.

The research of Cooper et al. (2002) qualitatively examined professors' beliefs about memorization and its influence on student learning. Cooper et al. interviewed a sample of university science professors teaching in Australia about their beliefs about students' use of memorization to learn science material. Based on their findings, the researchers categorized professors' beliefs about the role of memorization in learning in three ways, which they explain should be viewed as a continuum:

- Memorizing as a minimal role in learning;
- Memorizing as a stepping-stone in progressing towards learning;
- Memorizing as a key-part of learning as a vital strategy to build knowledge;

While the research of Cooper et al. (2002) offers a compelling way to conceptualize professors' beliefs about memorization demands and their influence on student learning, it is limited because it does not offer ideas about professors' beliefs on the overriding construct of memory as a whole; rather, it looks at memorization specifically. One can infer that a professor's beliefs about memorization may allude to beliefs about the nature and function of memory. Another limitation of their study is it does not attempt to determine if the professors' beliefs about memorization reflect in their practice of teaching. As interesting as the beliefs professors espouse about learning and teaching may be, their utility is limited without an understanding of how and if they are applied in practice. This same limitation applies to all of the studies examined in this section; none of them attempt to determine if professors' espoused beliefs reflect in their practice of teaching. While it was not within the scope of these studies to examine if professors' beliefs about learning reflect in their teaching, Kane et al. (2002) assert this

unexplored area represents a major limitation of the extant literature on professors' beliefs about teaching and learning.

The studies discussed so far identify and label some beliefs about learning and teaching professors hold and categorize their methods, epistemologies, and pedagogical beliefs along several different continuums or dichotomous representations. Although categorizing professors' beliefs offers a generalized view of what they may think about teaching and learning, the views offered are often vague and fail to uncover the beliefs about student learning and cognition that drive professors' views and practice of teaching. Additionally, these studies do not examine if professors' practiced beliefs are congruent with their espoused beliefs about teaching and learning.

Categorical and dichotomous descriptions are not without merit as they do help one generalize and, possibly, further explore conceptual ideas about areas such as teaching and learning. A commonly found dichotomy in the research literature about teaching and student learning is the behaviorist versus the cognitive or constructivist paradigm. The terms cognitive and constructivist appear to be used rather synonymously. I, also, use them interchangeably in this study in order to represent the concepts I discuss in my findings in terms similar to the concepts referred to in the research literature. However, my intent in using the behaviorist versus cognitive dichotomy is not just to offer categorical descriptions of findings, but also to compare findings collected by using different methods, such as interview and syllabi analysis data, using similar terms. Therefore, I offer the following descriptions of these two theoretical learning paradigms.

It is important to note I use them as a theoretical base from which more specific conclusions are drawn or comparisons made, rather than as terminal findings.

Behaviorism

A commonly shared conception of behaviorist learning theories is that learning derives from the formation of habits that develop through associations strengthened by repetition and reinforced by positive feedback (Bruning, 1994). According to this paradigm, learning develops in hierarchical fashion and moves progressively from lower to higher-order skills, such as in learning mathematics. Mastery of each successive skill is essential to overall mastery of a particular domain of knowledge. Learning is generally measured with objective testing measures that require the regeneration of previously learned information, such as short answer or multiple-choice tests (Bruning, 1994).

Common teaching strategies of the teacher-centered approach (or knowledge transmission), which is strongly aligned with the behaviorist paradigm, are expository in nature. Gow and Kember (1993) suggest the qualities of professors geared towards knowledge transmission are: teaching for the goal of job training, believing strongly in using audio-visual materials, imparting information as a lecturer, and having sound knowledge of subject. Callahan, Clark, and Kellough (2002) suggest teachers who employ methods such as lecturing, whole-class discussions, questioning, and demonstrations use a teacher-centered approach. Bruning (1994) explains some of the limitations of the behaviorist paradigm as: the delay of problem solving, critical thinking, and application skills in order to build a foundation of more basic skills. Because of this, students may spend a great deal of energy engaging in repetitive tasks.

Constructivism

The constructivist paradigm suggests learning occurs when meaning is constructed by a person as a product of the interaction between what he or she already knows, the new information that the person encounters, and the process by which he or she learns the new material (Bruning, 1994). Prosser and Trigwell (1999) explain the world of learning is neither separate from the knowledge being learned, nor from the teacher; knowledge and the student are constructed in relation with each other. According to the constructivist paradigm, subject and student must be brought into relation with one another for learning to occur, an idea that is congruent to the learning facilitation orientation Gow and Kember (1993) describe in their research. They suggest the qualities of a professor acting as a learning facilitator are: teaching problem solving relevant to the course, using interactive teaching, guiding students, showing pastoral interest, and motivating students.

In terms of teaching methods, constructivism is aligned with what researchers term student-centered or social-interactive learning (Callahan et al., 2002). Gow and Kember (1993) suggest professors with a learning facilitation (student-centered) orientation may use cooperative learning and other small-group activities that require students to interact with one another, learn concepts, and form generalizations through applications of principles.

As previously noted, the terms cognitive and constructivist share many parallels and appear to be used almost synonymously at times. Because of their similar use, the

research I discuss that contains terms such as cognitive, rather than constructivist, can generally be considered as denoting the same philosophical intent.

Bruning (1994) explains cognitive psychology's dominant purpose has been "to explain human activity as fully as possible through understanding the cognitive processes of memory, thinking, problem solving and decision making" (p. 7). As it pertains to learning, Bruning further explains the goal of cognitive psychology "has been to illuminate the nature of meaningful, not rote, learning, and to develop theories that explain comprehension and knowledge utilization, not knowledge acquisition" (p. 7). A parallel between the aforementioned learning facilitation versus learning transmission dichotomy and Bruning's description of knowledge utilization and knowledge acquisition is apparent. This parallel suggests a strong similarity between the constructivist and cognitive paradigms of learning. Although Bruning acknowledges there are some commonalities between the cognitive and behaviorist paradigms, he notes cognitive theory has generally held a constructivist perspective, whereby comprehension and learning "have been seen as the "meaning-seeking" constructions of learners" (p. 8).

Bruning (1994) explains two variables cognitive psychology emphasizes—the prior knowledge of learners and how they structure that knowledge, and what learners do when they encounter new information—are also closely tied to constructivist notions of learning. Bruning's discussion of schemata, which are mental representations that help learners organize incoming information, are related to constructivism in that schemata are based on prior knowledge and serve as major vehicles towards constructing new knowledge.

While the literature reviewed thus far highlights the key studies conducted on professor and teacher beliefs about learning and offers descriptions of the behaviorist and constructivist learning paradigms, the following literature will highlight some of the more general and salient themes found in the literature about the psychological constructs of motivation, attention, memory, and learning strategies.

Motivation

This study makes use of the salient extant literature on motivation that often discusses motivation in terms of intrinsic and extrinsic motivation and learning and performance goals. Intrinsic motivation and learning goals can be related with constructivism, while extrinsic motivation and performance goals can be related with behaviorism.

Early behavioral theorists conceptualized motivation as the satisfaction of biological drives (hunger, thirst, air, sex, etc.) and secondary drives (fear, anxiety, other incentives to perform an action) by behaviors that depend upon habit strength (Eccles, Wigfield, & Schiefele, 1998). Eccles et al. explain early behaviorists believed behavior is controlled by its consequences, whereby positive consequences lead to an increase in frequency of a behavior and negative consequences decrease the frequency of a behavior. Henderson (2003) suggests professors with extrinsic motivation beliefs may use good grades and praise as reinforcement, and low grades and humiliation as punishment. However, Eccles et al. assert intrinsic motivation decreases when external control is exerted and when negative feedback is given.

Eccles et al. (1998) report modern motivational theorists believe motivation is based on internal cognitive representations and processes rather than the satisfaction of psychological drives and emotional states. Eccles et al. assert current motivational research reflects the difference between the early behaviorist and modern cognitive theorists, as a great deal of motivational research is now focused on cognitions such as: attributions for success and failure, self-efficacy beliefs, control beliefs, self-regulatory beliefs, and goals.

Research suggests an individual's intrinsic motivation is increased when they are interested in learning material and view it as relevant to their lives. Eccles et al. (1998) explain individuals are intrinsically motivated when they do activities for their own sake and because they are interested in the activity. McKeachie (2000) suggests students enjoy learning if they see the relevance of a task or material to their own lives and interests and if they are allowed choices in learning situations to make them interesting and satisfying.

Motivation can also be fostered in students by teaching students how to evaluate their own learning so they can assess their work, see their progress, and enjoy the feeling of gaining skill and mastery over a task (McKeachie, 2000). The inference can be drawn that if a professor can help increase a student's confidence and self-efficacy in learning by helping him or her master learning material that is made interesting and meaningful to the student, a student's motivation to learn may increase as a result, thereby increasing their intrinsic motivation to learn more. Eccles et al. (1998) explain intrinsic motivation is maintained when students feel competent and self-determined.

In addition to increasing intrinsic motivation by showing the relevance of learning material, fostering student self-efficacy, and increasing a student's interest and curiosity, professors can also increase a student's motivation through the teaching methods they use. Bruning (1994) suggests the social context of a learning activity can act as a powerful motivational agent for a student. Bruning explains collaborative learning, through methods such as group work, allows instructors and more advanced students to serve as models for other students, which may increase a student's motivation to learn. Because of the necessity to express ideas clearly when actively working with others, all participants may be challenged to higher levels of learning than any of them could have accomplished alone (Bruning).

Student motivation has also been examined in terms of learning and performance goals. Crocker and Nuer (2002) describe performance goals as "centered on one's performance in a domain" (p. 1), with success or failure being dependent upon the outcome of the performance, such as getting an "A" on a test or receiving praise for one's effort. A correlation between performance goals and the behaviorist notion of motivation is apparent as both are based on external rewards and reinforcement. Crocker and Nuer define learning goals as activities aimed at improving oneself and finding new areas to improve upon or learn more about. One can infer from this definition that failure does not imply a lack of ability to learn so much as it provides information about what needs to be learned and from where it can begin. Bandura and Dweck's study suggests that people with performance goals generally regard their abilities as fixed and not amenable to

change, while those with learning goals tend to regard their abilities as malleable and amenable to change through persistent practice (as cited in Crocker & Nuer, 2002).

The way professors view motivation likely affects the way they teach and structure learning. By the same token, the way students approach learning says much about the nature of their motivation. Henderson (2003) explains students motivated by performance goals may want to maximize success, avoid failure, and look good to others, while students motivated by learning goals may seek to acquire more knowledge or skills. A teacher who believes in performance goals may emphasize testing and rewarding of student ability, while a teacher who believes in learning goals may be more concerned with helping to develop student ability and may set up grading systems that allow for failure (Henderson).

The way professors think about student motivation most likely exerts a strong influence on the way he or she teaches and structures learning situations. While research tells us much about the nature and function of motivation, professors' beliefs about motivation have been left unexplored.

Attention

In this study, I examined the construct of attention along three perspectives: volitional, behaviorist, and cognitive. Common sense dictates that attention is vital to learning because little can be learned if one does not pay attention to the learning tasks at hand.

Henderson (2003) explains that some early philosophers and psychologists believed attention is an act of will or volition. Reason (1984) offers that early

psychologists expressed the idea that while novel and exciting objects capture one's attention easily, a person must exert their will to pay attention to less engrossing activities. This concept makes a strong connection between interest and attention and suggests it is one's responsibility to force their one's self to pay attention if they do not have enough personal interest in an activity to do so. With the obvious correlation between interest and motivation, the volitional perspective of attention suggests one's ability to pay attention is contingent upon one's interest in the activity and one's motivation to accomplish the activity. Henderson posits a teacher holding a volitional view of attention may hold students morally responsible for paying attention by exerting their will to pay attention despite distractions.

B.F. Skinner provides a behaviorist view of attention as a functional relationship between stimulus and responses (as cited in Barkley, 1984). Barkley interprets Skinner's view about attention to mean, "...attention is not a thing, entity, or a mental function but a shorthand term for a set of relations between stimuli or events and responses to them—a correlation if you will" (p. 48). Barkley continues, "The correlation varies in strength and is not so important as the determination of the factors of which these correlations are a function" (p. 48). Barkley further explains the factors Skinner explained about attention are related with the immediate consequences of responding to a stimulus. In short, the behaviorist view of attention suggests paying attention is not an act of will, but a functional relationship between a participant and his or her environment that is contingent upon reinforcement.

According to Henderson (2003) behaviorists theorize that attention is a product of selectively reinforcing attentive student behaviors by awarding good grades or giving students praise or attention. As with other behaviorist theories that suggest behaviors become habits, a behaviorist perspective of attention suggests students should develop the habit of paying attention and it should generalize to a variety of situations (Henderson).

Cognitive psychologists often cite two forms of attention: orienting and selective attention. Halperin (1996) explains orienting attention can be a voluntary or involuntary response to a novel or significant stimulus. Halperin further asserts that orienting attention is a necessary precursor for selective attention.

Selective attention is described by Halperin (1996) as "the ability to focus on relevant stimuli while ignoring irrelevant information" (p. 126). This type of attention may also be voluntary or involuntary. Although a student's selective attention capacity is limited, the amount of material a student processes may be greater when selective attention is involuntary. Halperin explains the amount of information a student can process increases as an individual shifts from an effortful to automatic mode of processing, although the student may not be aware of the shift.

According to Henderson (2003), teachers who hold a cognitive understanding of attention may create novelty and variety in the classroom to support selective attention. He continues: "Those teachers may move away from a podium or seat, move around the room, avoid monotones, frequently change activities, and otherwise ensure that change is an important part of their teaching" (p. 6).

Fulk (2000) suggests the following methods for teachers to help students pay attention:

- Use a variety of introductory activities to stimulate student interest in the learning task.
- Make material relevant by stressing ways the content is meaningful or applicable to students' lives.
- Use teams and group work.
- Use a variety of graphic organizers and visual displays.
- Use a variety of methods to keep students actively involved in practicing new skills.

McKeachie (2000) describes attention as an evolutionary holdover that protects us from prey by helping us notice changes in our environment, an ability he explains is motivated by our survival instinct. According to McKeachie, motivation is one of the two main factors in maintaining attention, along with noticing environmental change. Therefore, novelty and variety in the classroom environment should aid in individual in paying attention. McKeachie described several strategies a learner can use to enhance attention in a less-than-optimal learning environment:

- Changing activities when attention wanes.
- Sitting in an upright posture, moving around, or getting up when attention decreases.
- Asking a lecturer a question if he or she uses a monotonous tone of voice.

- Taking more notes or writing examples or possible applications of the subject matter.

The different beliefs professors may hold about the function and nature of attention likely influences the way they structure their teaching and the classroom environment and their beliefs about the skills and abilities their students bring to the learning situation. Although research has much to offer about the construct of attention, we know little about professors' beliefs about attention.

Memory

Cognitive psychologists assert memory is an active, reconstructive process. Memory is vital in the development of reconstructed knowledge because no meaning or knowledge can be constructed without a prior point of reference that is housed in memory. While memory allows for retrieval of old information to be expanded upon, it is also called upon to handle new data, although it can only handle a few "chunks" at a time (Bruning, 1994). Bruning explains memory is fragile, as new information that has not yet been encoded is easily lost. Bruning further asserts the fragility of memory becomes less severe upon stable encoding, at which point memory is then altered by the schemata to which it is attached.

Prior knowledge represented as schemata is essential to the learning of new knowledge (Bruning, 1994). According to Bruning, schemata are mental frameworks that a person has that are built upon prior learning and influence how and what students will attend to and perceive during learning opportunities. Because the constructivist approach to learning places the emphasis of learning upon students actively attaching the meaning

of new material to previously understood concepts, schemata are instrumental in the learning process. Long-lasting learning has been attributed to engaging a student's prior knowledge structures, without so doing, learning is superficial and quickly lost (Bruning). As it pertains specifically to memory, Bruning explains schemata "add greatly to the memorability and utility of new information—prominent goals in our college classes" (p. 18).

Henderson (2003) suggests professors with a reconstructive view of memory (associated with the constructivist/cognitive view) may believe memories are "constructed products based on new material to be learned, what the student already knows about a topic (accurately or not), and the meanings the students attribute to the new material..." (p. 7). Henderson further explains that professors with a reconstructive belief in memory may attempt to have students make new material meaningful and memorable by engaging student thinking in classroom activities and out-of-class assignments. This type of belief in memory appears to parallel the teaching orientation Prosser and Trigwell (1999) describe as learning facilitation and the deep and achieving approach to learning they describe, both of which are aligned with the constructivist paradigm of learning.

Henderson (2003) asserts a common view of memory professors may hold is that memory works like a tape recorder and stores information in a more or less verbatim form. Henderson further posits that professors holding a "tape-recorder" belief of memory might see teaching as conveying information from the teacher to the student's memory and may "stress memorization of significant amounts of information that they

presume will remain in storage for long periods of time" (p. 7). Similar to the knowledge transmission teaching orientation and surface approach to learning suggested by Prosser and Trigwell (1999), this view may be associated with the knowledge transmission teaching orientation and surface approach to learning suggested by Prosser and Trigwell and tends to support the behaviorist paradigm of learning.

Another inference that can be drawn about professors with a tape-recorder view of memory is that repetition may be all that is necessary for information to be stored, as they may believe the information has been stored in a nearly verbatim manner and, therefore, may not need additional elaboration or transformation to enable later recall. The idea of repetition as a means to enhance learning is deeply rooted in the behaviorist tradition.

The beliefs professors hold about how memory functions have implications about how much and to what degree professors believe information is stored. Bruning (1994) suggests people tend to "recall the gist of passages rather than verbatim content" (p. 9). Bruning offers that the ability to recall the gist of presented information, as opposed to recalling it verbatim, explains a tendency of people to remember important information instead of unimportant information, or in other words, recalling the gist of information rather than every detail. Therefore, professors who expect students to recall very detailed amounts of information may, indeed, believe that student memory functions like a tape recorder and stores information in great detail, which can be recalled nearly verbatim. This type of belief about memory storage and retrieval may, too, indicate a behaviorist view of memory that appears to parallel the knowledge transmission orientation to

teaching proposed by Prosser and Trigwell (1999), as both suggest information may be transmitted directly to a student's memory.

Considering the inverse, professors who believe memory serves to capture the gist of presented information—that which is most important to the learner, may hold a constructivist view of memory that takes into account prior knowledge because what a learner considers to be important must logically have a previously established base housed in memory. Therefore, a professor who holds a belief that memory serves to capture the gist of information might also support the learning facilitation orientation, which Prosser and Trigwell (1999) assert is associated with the constructivist paradigm of learning.

Henderson (2003) explains professors with different beliefs about how much detail is stored in memory "...are likely to make different judgments about what students bring to the learning situation, are likely to design different kinds of classroom activities and out-of-class assignments, and are likely to expect different kinds of performance on exams" (p. 7).

In looking at professors' beliefs about the nature and function of memory in student learning, it may prove valuable to assess the memorization requirements professors have of their students. The research of Cooper et al. (2002) suggests professors' beliefs about memorization may be understood as a cognitive act that falls along a continuum of importance as it applies to understanding. Their research proposes professors' beliefs about memorization may fall along a continuum such as the following:

- Memorization as a "minimal role" in learning (such as rote memorization in order to reproduce facts.)
- Memorization as a "stepping-stone" in order to advance one's learning.
- Memorization as a "key-part" of learning, used to build knowledge, even expert knowledge.

A key difference between the stepping-stone and key-part descriptions of the use of memorization is the stepping-stone description does not imply facilitation of long-term recall or development of expert knowledge without more learning, while the key-part description encapsulates both ideas.

Professors who make use of memorization as a minimal role or stepping-stone to learning may hold a belief in memory, such as that of Bruning (1994), who posits memory is a reconstructive process based on making connections between old material and new material, which suggests a cognitive or constructivist view of memory. Professors holding this view of memory and memorization may additionally believe students can store and recall the gist of the information they are presented, but not necessarily in great detail.

A professor who makes use of memorization as a key component of learning may hold a behaviorist view of memory as a cognitive act enhanced by repetition and rehearsal. Professors holding such a view may believe in a tape recorder version of memory and expect students to store and recall information in great detail.

While the extant literature tells us much about memory, professors' beliefs about memory are still largely unknown. The work of Cooper et al. (2002) illuminates the

beliefs a sample of professors hold about the role of memorization in students learning science, but there is still much to be learned about professors' beliefs about memory in general.

Learning Strategies

In this section, I examine professors' beliefs about the learning strategies of their students, how professors might help students utilize different learning strategies, and the beliefs about learning strategies professor's exhibit in their practice of teaching.

Henderson (2003) asserts students utilize a variety of cognitive strategies to make new learning material meaningful, which professors should capitalize on "by designing activities that encourage their use or even teach cognitive strategies directly" (p. 2). Metacognition, or thinking about thinking, is certainly a cognitive construct that may guide a student's approach to learning and help them decide what types of learning strategies to employ. Because of the importance of metacognition, it is a cognitive activity professors may attempt to foster in their students. Bruning (1994) describes metacognition as an individual's knowledge about his or her own thought processes and the ability to use that knowledge in a meaningful way to guide thinking. Clearly, this suggests a student's metacognitive abilities will influence both the way he or she approaches learning and the learning strategies he or she employs to learn.

McKeachie (2000) suggests a strategy to improve learning using metacognitive planning is to think about how to approach a certain task, such as reading or taking notes from a lecture. McKeachie also explains professors can teach their students cognitive learning strategies to help them learn more effectively. McKeachie explains, "Teaching

students to 'chunk' things into groups or categories; teaching them to look for the organization of a textbook chapter before reading it; teaching them to organize their notes of lecturers or reading and perhaps to use graphic organizers—all of these can contribute to learning effectiveness" (p. 12).

Based on Howard Gardner's Multiple Intelligences Theory, Nolen (2003) discusses how teachers can teach toward and capitalize on many of the various learning styles (or intelligences) and learning strategies students may employ in the classroom. Nolen explains "linguistic learners" need teachers to use language students can understand and relate to; "mathematical-logical" learners need to be given the opportunity to think abstractly and identify patterns of reasoning in material; students with "spatial intelligence" may benefit from visual representations of learning material, such as films, overheads, and diagrams; students with "bodily-kinesthetic intelligence" may prefer hands-on activities and experiences; those with "interpersonal intelligence" may benefit from group work and collaborative learning activities; and those with environmental or naturalist intelligences may benefit from learning through outdoor activities or by having material presented in an environmental context, such as discussing how mathematical principles are found in and govern nature. Nolen further suggests, "All of the intelligences described...are a better way for teachers to understand and accommodate different learning styles" (p. 119).

Shakarian (1995) also supports the notion that students learn best when presented information through different modalities, which she also ties to active learning. Shakarian explains that teachers who consistently use different active learning strategies such as:

cooperative/ collaborative learning, simulations, role-playing, debate, peer teaching, and case studies, might better match teaching method with a student's preferred learning style. Henderson (2003) posits professors who believe students need active involvement with material from different learning perspectives in order to learn may employ teaching activities such as: cooperative learning activities, case studies, and simulations.

Henderson (2003) suggests professors' beliefs about learning strategies may be related to their beliefs about memory storage. For example, a professor with a behaviorist view of memory might believe memory functions like a tape recorder and captures information nearly verbatim. A professor with such a view may also believe that repetition will increase a student's recall of information. Because the behaviorist view of memory is aligned with the knowledge transmission orientation to teaching, a professor with a behaviorist belief of memory may believe students will learn if they listen and take notes in class and then rehearse the material, perhaps by repetition. In contrast, Henderson explains professors with a reconstructive view of memory may believe learning requires more in-depth forms of learning strategies, such as actively organizing and elaborating on new material to connect it to prior knowledge and by applying it to new situations.

The literature about learning styles and strategies suggest professors can influence student learning in a variety of ways and should take into account the personal learning styles and strategies of their students in order to help them learn effectively. Research provides a great deal of information about learning strategies but does not offer much on

professors' beliefs about them, leaving a void in our knowledge about how professors think about learning strategies and how their beliefs may influence their teaching.

While there is a wealth of research that provides information about the psychological constructs of learning, there is a lack of research that examines professors' beliefs about how these constructs function and how they influence student learning. Clearly, the beliefs professors hold about the psychological constructs of learning influence how they teach their students, which, in turn, has an influence on how well students learn. Not only are professors' beliefs about most of the psychological constructs largely unknown, we also do not know what extent their beliefs may reflect in their practice. Kane et al. (2002) provide a review of existing studies about professors' beliefs about teaching and learning, explaining the studies share a common limitation in that they do not examine professors' beliefs as reflected in their practice of teaching.

Statement of the Problem

Studies on professors' beliefs about teaching and student learning have generally been formulated and undertaken to provide categorical results, such as behaviorist versus cognitive, transmissive versus facilitative, objectivist versus constructivist, etc. Because these studies offer only vague categorical descriptions of professors' beliefs about teaching and how learning occurs, they do not address or advance the literature on professors' beliefs about the psychological constructs that comprise learning. In addition to the limits of the extant literature on professors' beliefs about the psychological constructs of learning, there is a paucity of research about how professors' beliefs about

learning reflect in their teaching, namely how much their practices are congruent with their espoused beliefs.

Therefore, the purpose of this study is to describe professors' beliefs about the psychological learning constructs of motivation, attention, memory, and learning strategies, both espoused and in practice. Because of the paucity of research that describes the beliefs professors espouse about the psychological constructs of learning, as well as how those beliefs reflect in their practice of teaching, a research study devoted to addressing this problem is clearly needed.

Chapter III

Methods

Participants

The participants in this study are 10 college professors from Western Carolina University. Five of the professors interviewed are experienced professors who have won or have been nominated for teaching awards such as Western Carolina University's Board of Governors Award, while the other five professors are second-year, tenure track professors. I chose these two groups to determine and describe possible differences in beliefs among professors according to teaching experience. To have a sample that is representative of the school's academic diversity, I chose participants from each of Western Carolina University's four academic colleges: College of Applied Sciences, College of Arts & Sciences, College of Business, and College of Education and Allied Professions.

Participant Selection

The researcher and the researcher's thesis committee selected the 10 participating professors ad hoc. Professors who are reflective about their teaching, willing to participate in the study, and willing to talk freely about their teaching ideas were considered as viable participants for the study. According to Creswell (1998) ten subjects represents a reasonable sample size because in-depth interviews can last as long as two hours and produce a large amount of data to be transcribed and analyzed.

Statement of Confidentiality

In order to protect the confidentiality of all participants, the names of the professors are replaced with pseudonyms. The participants agreed to the terms of the Informed Consent Form and were told their interview data and submitted documents would be kept secure and would be destroyed after the research was completed. Participants were informed that their names would be replaced with pseudonyms and only their academic department and years of experience would be used in the written results. A copy of the Informed Consent Form used is included as Appendix B.

Procedure

Interviews. According to Kagan (1990), extended personal interviews are the best way to access a person's beliefs because they can recall specific instances or experiences. Kagan asserts, "Researchers must then infer underlying beliefs from the data generated by these tasks" (p. 420). Creswell (1998), too, suggests the meaning of the participants' experience is primarily gleaned from analyzing the statements obtained during in-depth interviews with the participants.

I conducted and recorded in-depth interviews to learn about and help describe professors' beliefs about student learning as they pertain to the cognitive constructs of motivation, attention, memory, and learning strategies. I used a semi-structured interview format using open-ended questions to allow the participants the opportunity to speak freely about their experiences.

After I presented my thesis proposal to the Qualitative Research Group of Western Carolina University, the group and I developed a pool of potential interview

questions to use during the interviews, which I then, with the assistance of my thesis committee, pared down to ten questions that comprised the interview protocol. The following questions were used as the interview protocol:

1. Tell me about a time when your students were really learning what you wanted them to.
2. How do you know or how can you tell that your students are learning?
3. How do you know if they're not learning?
4. Tell me about a time when your students were enthusiastic about learning.
5. Tell me what types of things you do to help your students pay attention during class.
6. What kind of demands do you place on a student's ability to memorize in your classes?
7. Do you give your students any suggestions or tips to help them become more effective students or learners?
8. Tell me something you do to motivate your students to learn.
9. Tell me about a time when your students seemed very motivated.
10. Tell me how you evaluate student performance and why.

I transcribed the recorded interviews verbatim, which averaged 20-25 pages in length. I identified dimensions of the professors' beliefs from the interview data and grouped and coded their responses according to fit. In addition to the aforementioned constructs of motivation, attention, memory, and learning strategies, I coded and analyzed the interview data for the emergence of other consistent themes.

I treated each interview as an individual case and wrote a case analysis about each participant to describe their beliefs about the four psychological constructs studied in this research. Patton (1990) proposes the utilization of cross-case analysis, which entails comparing participant responses to other participant responses in order to examine consistencies and variability between cases. I used cross-case analysis after I used individual case analysis and analyzed the data both between and within groups to determine similarities and differences of the two participant groups of award-winning professors and second-year tenure track professors. A sample interview transcript is included as Appendix A. I chose this transcript because it is rich with information and descriptions of the learning constructs examined in this study.

Document analysis. I utilized syllabi analysis to obtain additional data about professors' beliefs and to ascertain how professors' beliefs reflect in their practice of teaching. Because Kagan (1990) warns that teachers are often unable to articulate, or make explicit, the beliefs that describe their cognitions about teaching, using syllabi analysis serves as a valuable tool to help make the professors beliefs explicit. Bogdan and Bilken (1998) support the analyzing of documents in qualitative research to support data obtained from interviews, explaining documents can serve as rich descriptors of the subject being studied.

The possible ambiguity of professors' responses to interview questions supports the need to incorporate more than one method of research in this study to better ascertain and describe professors' beliefs about teaching and learning. For this reason, the professors were asked to submit a representative course syllabus for a class they teach for

my examination. In the event of receiving syllabi for more than one course from a professor, I randomly chose one to use for syllabi analysis purposes and used the same one for all syllabi analyses employed in this study. I examined the syllabi to better understand the professors' beliefs about teaching and learning and to estimate how much the beliefs professors espouse reflect in their practice. Because I examine the syllabus of only one course a professor teaches, the syllabi analysis findings are tentative and may not reflect their practices as reflected in other courses they teach.

To ascertain how professors' espoused beliefs about motivation may reflect in their practice of teaching, I analyzed their syllabi for evidence that professors allow students choices in the activities they do, provide opportunities for students to engage with learning material in ways that might elicit interest and curiosity, and allow for failure by using a variety of graded assignments by which students might demonstrate learning. I consider professors whose course syllabi suggest they fulfill most of these criteria (at least 2 out of 3 categories) to exhibit an intrinsic view of motivation through their teaching. Professors who view motivation as extrinsically influenced may, conversely, provide little or no student choice of activities, provide for little or no variety in graded assignments, and provide more or less "standard" assignments or projects that students may not find particularly interesting.

I utilized the following criteria to evaluate professors' syllabi for evidence of the beliefs about motivation they exhibit in practice:

1. Nature of assignments. I examined syllabi to determine if professors attempted to elicit curiosity and interest from their students by affording them the opportunity

to engage in learning material through projects requiring out-of-class effort and that students might find interesting, such as interviews, debates, presentations, written reflections, or activities other than a standard research paper. While some students may find research papers interesting, I assert many students, particularly undergraduates, may find other ways of engaging in learning material to be at least as interesting, if not more so, than completing a research paper might be.

2. Choice of activities. I examined syllabi to determine if professors offered students choices in the assignments they were to do (i.e., allowing for a required student project to be either a research paper, class demonstration, panel debate, or allowing them to choose the topic of a particular project). It should be noted, however, that a professor might offer students choices in the activities they do, but not explicitly state that fact in their syllabi.
3. Variety of graded assignments. I examined syllabi to determine if professors offer students a variety of graded activities, rather than utilizing exams, tests, and quizzes as the sole source of grades. I assert professors who offer a variety of graded measures (i.e., graded projects, homework, participation grade, weekly reading quiz, written reflections, etc.) allow for student "failure" by taking into account other measures and opportunities for students to demonstrate learning. For the purpose of this research, I suggest professors who use a variety of graded assignments and base 75% or less of a student's grade on exam grades allow for student failure. I chose 75% as an approximate value, as five professors used

more and five professors used less than this percentage to award final grades based on exams.

To ascertain professors' beliefs about memory they exhibit in practice I examined course syllabi for evidence of in-class activities and out-of-class assignments that might attempt to engage student thinking and encourage a "deep and achieving" approach to learning, such as cooperative learning activities, case studies, lab activities, presentations, or other means that may engage students. Professors whose syllabi provide evidence of any of these activities are considered to hold a cognitive belief of memory. A professor with a behaviorist understanding of memory may not believe it is necessary for students to engage in in-class and out-of-class assignments, other than lecture and reading to commit information to memory, so professors' syllabi that do not provide evidence of in-class or out-of-class activities, other than reading and lecture, are considered to hold a behaviorist view of memory.

To discover professors' beliefs about learning strategies they exhibit in practice I examined professors' syllabi for evidence of in-class and out-of-class assignments and activities that might suggest how professors capitalize on and provide opportunities for students to actively engage with learning material in a variety of ways. Therefore, syllabi were examined for evidence of professors' use of in-class teaching modalities and assignments other than only lecture, and for out-of-class activities other than reading assignments. Professors who satisfy one or both of these categories (variety of in-class and/or out-of-class activities) are considered to capitalize on different learning strategies of students.

I considered the syllabi analysis findings to gain an overall impression of each professor and classify his or her beliefs about motivation, memory, or learning strategies according to fit. I then compared the findings of the interview and syllabi analysis data to estimate congruence between espoused and practiced beliefs. Again, it should be noted that the interview and syllabi analysis data examine professors' beliefs in two different contexts. The interview data mainly suggest professors' beliefs about teaching and learning via classroom interaction, while syllabi analysis data suggest how professors might promote learning through course assignments/activities and/or student grading policies. The comparisons between the two are not direct and only offer an approximation of congruence between beliefs and practice. Syllabi analysis was not utilized to examine professors' beliefs about attention because the syllabi do not provide evidence pertaining to professors' beliefs about attention.

Before interviewing professors, I examined, but did not analyze, their course syllabi to learn about their teaching practices. After all interviews were completed, transcribed, and coded, I began syllabi analysis, followed by data analysis. The sequence of events in conducting research can influence research findings, but it is not clear if the results of this study are so affected.

Data Analysis

Denzin (1978) explains case analysis involves interpreting data in a case-by-case or participant-by-participant basis and drawing upon and finding emergent themes expressed by the participant, while cross-case analysis entails looking for themes and patterns in the data within the participant group as a whole and drawing conclusions

regarding the group or a dimension within the group. Denzin further suggests these are conceptually different approaches towards analyzing qualitative data, but can be employed simultaneously and work together in fleshing out emergent themes from the data.

Utilizing the case analysis and cross-case method, I analyzed the interview data using the guidelines Creswell (1998) and Coffey and Atkinson (1996) propose for analyzing interview data. Creswell proposes the following for analyzing interview data:

- Give a description of the researcher's own experience of the phenomenon.
- Read through the interview transcriptions.
- Form initial codes from the data.
- Describe the meaning of the codes from the researcher's perspective.
- Find and list statements of meaning for the individual participants.
- Group the statements into units of meaning.
- Develop a textural description of the statements (what happened).
- Develop a structural description of the statements (how it was experienced).
- Develop an overall description of the experience (the essence).
- Present a narration of the "essence" in the form of tables or figures of statements and units of meaning.

Coffey and Atkinson (1996) suggest a coding schema where one first identifies common themes or domains, followed by categories and then subcategories of the themes to code the data into units of meaning. To begin the process of coding, I read each transcript once to regain familiarity with the material, a second time to identify common

themes and categories, and a third time to identify subcategories. I then organized the coded material into thematic files with a word processing computer program. I then read the transcripts in the context of their coded themes several times during the analytic and writing process to better understand and describe the data.

The important act of coding data is condensing the bulk of data into analyzable units by creating concepts, themes, categories, and subcategories for analysis (Coffey & Atkinson, 1996). In simpler terms, Coffey and Atkinson describe coding data as "a way of relating our data to our ideas about the data" (p. 27). Although some interview data are lost in the coding process, the reduction of data does not necessarily mean a reduction of meaning. Coffey and Atkinson explain this paradox is not a simplification of the data, but a way to organize data to help them focus their effort on finding meaning. They further describe coding as "...going beyond the data, thinking creatively with the data, asking the data questions and generating theories and frameworks" (p. 30). Considering these ideas, I approached the coding process in a reflexive manner, going back and forth between data and codes until precise codes that best conceptualized the data material were discovered.

I implemented a coding system based on a "start list" of codes derived from the theoretical and conceptual frameworks of this research, a method of initial coding Coffey and Atkinson (1996) propose. I listed key concepts and theoretical ideas and further honed them into categories, subcategories, and then dimensions of the subcategories the data revealed. I did not ignore consistent themes that were not part of the short list, but coded them as they became evident, analyzed them for meaning, and described their meaning in the results section.

For the task of syllabi analysis, I developed specific criteria for each of the psychological constructs studied. Developing the criteria for syllabi analysis required making research decisions, professional judgments, and generalizations about the data in order to conceptualize it. I used the findings of syllabi analysis data to categorize professors' practiced beliefs for comparison against the categorical classifications of professors' espoused beliefs found in the interview data. In this study, I use categorical descriptions and comparisons of professors' beliefs, not as an end in itself, as with many research endeavors, but to offer a means of estimating how professors' espoused beliefs reflect in their practice. Additionally, the descriptions suggested by these means offer a base of comparison for further study about professors' espoused and practiced beliefs. I propose the methods of syllabi analysis chosen to examine the data in this study are a viable means to better describe professors' beliefs, especially considering the likely implicit nature of their beliefs.

Writing the results section is not a separate activity from analysis because a deeper level of interpretation is often obtained while writing up results, according to Coffey and Atkinson (1996). I found this to be particularly true in this research project and had to revisit the data several times to fully flesh out the findings and clarify my interpretation of their meaning. Coffey and Atkinson state,

> Data are not inert. They are not a fixed corpus of materials on which procedures of analysis are performed. We should be using data to think with and think about. This means bringing to bear an active, creative approach. (p. 191)

Although I utilized a rigorous and meticulously followed method of research and analysis, it was not a compartmentalized or wholly separate chain of events—an idea supported by Coffey and Atkinson (1996). They explain it is necessary to act reflexively when undertaking qualitative research, whereby all aspects of the research, data gathering, coding, analysis, and reporting of results, are connected with each other and are not separate phases of research activity. In keeping with that idea, I presented the first interview, transcribed and tentatively coded, to the thesis committee for suggestions and then did the same with the second interview. After transcribing and tentatively coding the first four interviews, I presented the findings to the Qualitative Research Group at Western Carolina University to obtain feedback and further suggestions about how to better clarify and conceptualize my work. The results of these efforts produced a refinement of ideas and added conceptual clarity and conciseness to the research effort.

I examined interview data and syllabi not only to use more than one source of data for the sake of increased validity, but also to more fully ascertain professors' beliefs about the research subject. I hoped to discover evidence of professors' beliefs in practice through syllabi analysis and compare them to their espoused beliefs obtained from interview data to arrive at some tenable, albeit limited, findings.

Chapter IV

Results

These results are based on the predetermined categories of attention, motivation, memory, and learning strategies that emerged from interview data and syllabi analysis. I use pseudonyms in place of the names of the actual participants to protect their confidentiality. The findings are comprised of interview excerpts and syllabi analysis data with the exception of the section on attention, which does not utilize syllabi analysis data. The data derive from interviews with the participants and from course syllabi they submitted for analysis, such as course syllabi.

Motivation

For the purposes of this study, I examined the construct of motivation in terms of intrinsic and extrinsic motivation, and learning and performance goals. In this section, I describe the beliefs professors espouse about motivation in interviews and discuss syllabi analysis findings that suggest how these beliefs may reflect in their actual practice of teaching. To conduct syllabi analysis, I examined course syllabi submitted by professors to see how they structure their classes in terms of assignments and grading policies. Examining these aspects of professors' teaching practices will better unable us estimate how professors' beliefs about motivation reflect in their teaching, as well as clarify how their beliefs about learning and performance goals may manifest in practice.

Comparing professors' espoused beliefs to the content and structure of their classes provides a more complete description of the professors' beliefs about the construct of motivation than interview data alone. However, the interview data generally reflect professors' beliefs about motivation in the context of how they interact with students in the classroom, while the syllabi analysis data suggests how the professors' beliefs about motivation reflect in how they structure and evaluate student learning. Because of these different contexts, the findings do not allow for direct comparison of espoused and practiced beliefs, only limited estimates of congruence.

Espoused Beliefs – Motivation

The interview data suggest a majority of professors interviewed for this study espouse motivational beliefs in keeping with the findings of McKeachie (2000) that describe student motivation as a primarily intrinsic construct that a professor can enhance by helping students understand the relevance of what they are learning, thereby increasing their interest in the material and increasing the motivation to learn more.

In the following excerpts the professors' names are replaced with pseudonyms, the number bracketed after their name refers to the question or prompt they are responding to and the letter "f" denotes a follow-up question. The interview questions are listed on page 33.

Relevance. Considering the importance of making material relevant to students in order to increase motivation, Cecil, a second-year professor, offers the following:

> Cecil [8]: I try to relate it to their life early on, so I try to always answer the "who cares?" question at the beginning of every class – "Here's why this matters for

this class and here's why this matters in your life or in the bigger picture." I always sort of try to start off with that "sell job" and I find that works pretty well. If I can tell them why it matters and they know it, then I found it's a lot easier to get them to learn it.

An award-winning professor, Deborah, expresses a similar belief about the influence of relevance on motivation:

Deborah [1-f]: I have found that the more I can apply something to the real world, the more likely it is students are going to want to learn. I mean, you got to have that desire there and that interest and so there are a lot of pieces to the puzzle. So, I found that what works best in what I teach is that if I can apply something to the real world and then they go "oh yeah, this is interesting, this is fun, let me see if I can work a little bit harder."

An award-winning professor, Brad, offers the following about intrinsic motivation and the importance of relevance:

Brad [8-f]: The desire to learn, I think, is an internal thing, so what I do is try to make it relevant to their lives, to tie in examples with their daily professional lives to the greatest extent possible, those kinds of things.

Bobby, an award-winning professor, indicates the need to show students the relevance of material as he explains the effect of a particularly motivating assignment:

Bobby [9-f]: With my graduate students, the whole issue of privacy, the whole issue of strategic planning and budgeting and prioritizing activities is of the utmost importance, so if I can tell them how to get what they want in their

organization through using these strategies and techniques and they practice it, use it, and it works, they go crazy!

Barbie, an award- winning professor, offers the following about the issue of relevance:

> Barbie [9]: I have a group that I'm taking to Italy and Greece. It's a 400 level Italian Renaissance course. They are so motivated! I'm killing them with work and they don't even know it because it's going to culminate in this trip in which all the stuff we're learning through the semester, they will see in Italy and Greece. So, it will be so much more meaningful for them having learned about it.

Finally Bianca, a second-year professor, discusses the motivational impact of relevance when she explains people with previous experience as a health care patient may be intrinsically motivated as health care professionals:

> Bianca [8-f]: A lot of people who come here, come here because they've had a physical problem in the past. They've had physical therapy and they just wonder about how the body works. So, internal motivators…I think those are the best kind of motivators you can come up with. Because you have a personal interest in something, that drives you to learn something. Maybe prior to having an injury, you never had interest in that body part and then you hurt it, now you have all kinds of interest because it affects you everyday, so I think that's why internal motivators are the strongest, just because they have a direct effect on our persons on a daily basis…

Clearly, a number of professors cite the importance of showing the relevance of learning material to increase a student's intrinsic motivation.

Self-efficacy. Several professors espouse a belief in the ability to increase student motivation by enhancing the student's feeling of self-efficacy through successfully learning material, intrinsically increasing their motivation to continue learning. The research findings of McKeachie (2000), and Deci and Ryan (as cited in Eccles et al., 1998) suggest a student's sense of self-efficacy increases intrinsic motivation.

Anna, a second-year professor, discusses the importance of a student's success in relation to motivation. Although she alludes to the concept of grades as a motivator, which is an extrinsic form of motivation, Anna explains how she fosters self-efficacy in the classroom:

> Anna [8]: I think its motivating for people when they know what the rules of the game are and feel like they have an opportunity for success, so I try to be as clear as I can about things. I try to make it as transparent as possible what the course is going to be like, what I'm expecting of them, what kind of quality work gets an "A."

Deborah speaks to the importance of self-efficacy in the following excerpt:

> Deborah [8-f]: The people are motivated when they feel like they can do something. I think they can be more motivated and I think a lot of our students don't have a lot of confidence, so they're not real motivated when they don't have a lot of confidence. But, if you can increase that confidence by showing them they can do the work, and I think we can, then they can do more.

In keeping with the importance of self-efficacy as a motivational tool, Barbie asserts the following when asked about how she motivates her students to learn:

> Barbie [8]: I'm never one to presume I'm the smartest one in the class and so I try and make them feel good about themselves and show them how much fun it is to be educated and how much fun it is know this stuff and I guess if you feel good about yourself and your own intellect, then you're motivated to learn more...

Curiosity and interest. Some professors express a belief in increasing motivation by eliciting curiosity and interest in the material being learned, a belief that Henderson (2003) proposes as a means toward increasing intrinsic motivation. The research of Eccles et al. (1998) also suggests heightened interest in learning material increases student motivation.

In addition to describing a time his students seemed very motivated, Cecil proposed the following as a reason for their motivation:

> Cecil [9]: I had one where I gave them the text of a speech and I said, "Write the article around this," which they enjoy doing because they think it's very practical and then I said, "Alright, now let's talk about how people framed this story," and they all framed it the same way and that seems to motivate. It sort of intrigues them because they know they did this assignment all separately, but they all saw it the same way. This sounds kind of bad too; it kind of tricks them in a way, so they think they're doing one thing and then the carpet is sort of pulled out from under them...and they say "What was I really doing here?" and that sort of gets them thinking.

Bobby expresses a belief that eliciting curiosity and raising interest in learning material results in more enthusiasm for learning, which suggests an increase in intrinsic motivation:

> Bobby [4]: Indications of that [enthusiasm] is when I start to get e-mails about things they have questions about or things they want clarification for or their enthusiasm. You can see that they are enthusiastic about the material or they pull an article off the Internet and it wasn't assigned or they're telling other classmates inside of class or outside of class about what they learned and what they found to be important or they speak up in class and say "This happened to me." It's just a very demonstrative way in which they ask me questions or seek my support and how they share that learning in class among their colleagues.

Grades and/or praise or consequences. Although most professors espouse beliefs supporting the notion of motivation as a construct increased by primarily intrinsic means (which is related with constructivism), several professors espouse views aligned with a behaviorist view of motivation, such as that described in Eccles et al. (1998). Eccles et al. explain the behaviorist view of motivation asserts that motivation is based on a series of psychological drives supported and reinforced by the environment.

Henderson (2003) ties the behaviorist notion of motivation into the practice of teaching by explaining that professors holding a behaviorist view of motivation may attempt to increase student motivation by mostly extrinsic means such as grades or reinforcement. Henderson suggests a teacher who believes in performance goals may emphasize testing and rewarding of student ability, while a teacher who believes in

learning goals may be more concerned with helping to develop student ability and may set up grading systems that allow for failure. I categorize the following professors beliefs about motivation as "behaviorist," although they do not explicitly state their beliefs in such terms. In fact, they all describe motivation, to some extent, as an "internal" process. However, internal does not necessarily mean intrinsic. At the same time, while these professors espouse a view of motivation in terms that may support motivation as an intrinsic component of cognition, I describe the following professors as possibly holding behaviorist beliefs for one or more of the following reasons: the professor does not offer examples of how to increase intrinsic motivation; the professor's only example of how to increase motivation could be construed as intrinsically or extrinsically motivating (i.e., praise fostering self-efficacy) with no further qualifying indicating the intrinsic nature of motivation; or the professor describes motivation as an internal construct, but only cites extrinsic motivators such as grades to influence it.

I offer the following as excerpts that reflect professor beliefs about motivation in keeping with a behaviorist understanding of motivation. The following professors appear to use grades and/or praise or consequences to maintain attention.

Jim, a second-year professor, alludes to his beliefs about motivation in the following:

> Jim [8]: I don't know if I really do anything in terms of motivating them to learn. I provide them with the information. I don't do any type of "carrot on a stick" type of motivational thing to learn. If they don't have the motivation to learn, then they need to be in truck driving school or something like that, because they're in

the wrong place. I guess one motivational thing or impetus is that I'll tell them what's going to be on the test. Not the day before, I don't do any study guides - they do their own study guide through classroom notes, but I'll tell them, "You're going to see this again on the test, do you have any questions?"

Jim suggests motivation is internal, but then offers students the chance to increase their grades when he shares the material that will be on a test, presumably resulting in a higher test grade, which is an extrinsic motivator.

William, an award-winning professor, offers the following about motivation:

William [8]: Well, in any class where you're giving tests – I mean that's a "stick" kind of motivator as opposed to a "carrot" – but knowing that there are tests throughout the class...knowing that they will be tested, even if the student is getting behind or what not, when test time comes that sort of puts the pressure on you to go back and, "Now I've really got to sit down and look over this last bit of material and focus on it." So tests are a big motivator, I think, at least for those who take grades seriously. You see, you don't know what you can do to reach different people and I don't know what other faculty do. That'd be something interesting to find out – what do you do to motivate students to learn, other than tests and the grading system that we have and I don't know. I think that basically with each student, the amount of motivation they have is intrinsic to them and assigning grades is a way that maybe, a marginal bit, may encourage students to become more motivated, but I don't think there are students who make an "A" that would not learn anything if there were not the test there. I think what it is, is

that you have a certain amount of motivation and a test can help bump that up a little bit, but the motivation is either already there or it isn't.

William qualifies his belief about grades not being a strong motivator, but he explicitly states he does not know what else to do to increase motivation. William's final statement, "...but the motivation is either already there or isn't" suggests he believes motivation, overall, is not very amenable to external influence, whether extrinsic or intrinsic.

Because the sole source of increasing motivation to William appears to be grades, although with a limited degree of influence, the beliefs he espouses about motivation and how he attempts to increase motivation appear to be more in line with the behaviorist notions of motivation.

Petra, a second-year professor, echoes the sentiment of some of the professors who espouse intrinsic beliefs about motivation, particularly in fostering self-efficacy through encouragement. Petra mentions being the students' "cheerleader" in a prior statement and offers the following:

> Petra [4-f]: Sometimes all you need is someone saying, "you can do it," somebody believing in you. Sometimes that's all it takes and, you know, I can be a cheerleader. It doesn't cost me anything. It doesn't cost me any effort. It doesn't cost me anything. I have nothing to lose by doing that. If you can get somebody believing they can do it, then they can do it and sometimes all it takes is somebody reaffirming that for them.

While one could construe Petra's statements as support for promoting self-efficacy through the use of encouragement, they could also be viewed as "praise," which is an extrinsic motivator. An important distinction to make between the statements Petra espouses about motivation, compared to other motivational beliefs professors espouse, is other professors give examples of additional intrinsic motivators they employ, while Petra does not identify other ways she attempts to foster motivation in her students. This finding does not suggest she uses no other means of increasing intrinsic motivation, only that they were not evidenced in the interview data.

Syllabi Analysis – Motivation

The interview data suggest a majority of professors espouse beliefs about motivation that support using intrinsic means to increase motivation. While not offering a direct comparison, syllabi analysis tends to suggest their beliefs are supported in practice. For example, Cecil's espoused beliefs suggest he attempts to increase intrinsic motivation by showing relevance and eliciting student interest and curiosity. Syllabi analysis suggests Cecil offers choices to students by allowing them to choose research topics, although the research project he requires of them appears to be a standard research project that students may or may not find particularly interesting. Syllabi analysis also suggests Cecil may allow for student failure, which might suggest a belief in learning goals, by allowing students multiple ways to demonstrate learning as his exams count for 45% of a student's grade, homework assignments and a project account for another 45%, while attendance, participation, and in-class assignments count for the remaining 10%. These findings suggest Cecil allows students choice in assignments and provides a

variety of graded measures to allow students different ways to be evaluated and demonstrate learning, which may suggest his practice reflects a belief in intrinsic motivation.

Interview data suggest Barbie espouses a belief in increasing intrinsic motivation by showing the relevance of learning material during her classroom interaction with students. Syllabi analysis findings tend to suggest Barbie provides students choices in assignments by allowing them to choose a book to review, may elicit interest and curiosity from students by providing assignments such as book reviews and written reflections, and provides a variety of graded measures to allow for failure. Barbie's exams count for 50% of a student's grade, a book review counts for 10%, reflections of readings are 20%, and reading quizzes count for an additional 20%. This grading structure may reflect a belief in learning, rather than performance goals, because it allows for student failure and does not rely heavily on exam grades to evaluate student learning.

Because interview data do not offer much insight about professors' beliefs about learning and performance goals, syllabi analysis findings about them are rather limited in utility and can only suggest how professors' beliefs about them might reflect in their practice. The findings about learning and performance goals may not accurately capture professors' beliefs about them because a professor's in-class methods and interaction with students may likely be influenced by their beliefs about goals, which this method does not address.

Although the means employed in comparing espoused and practiced beliefs do not offer a direct comparison of beliefs, it does suggest whether their beliefs and practices

tend to support either intrinsic or extrinsic beliefs about motivation. The amount of congruence between the two can only be inferred from that point. With that in mind, the syllabi analysis findings appear to support the interview findings about the other professors who espouse beliefs in intrinsic motivation, but tend to suggest two professors' espoused beliefs about motivation are not reflected in practice by the means employed by this study. This is not surprising considering the aforementioned limitations of the measures utilized in this research and may or may not reflect the way their beliefs about motivation actually reflect in their practice of teaching.

Deborah's interview responses suggest a belief in increasing intrinsic motivation by increasing self-efficacy and illustrating relevance of material through classroom interaction with students. Syllabi analysis suggests she attempts to elicit interest and curiosity of her students by assigning computer projects that are relevant to coursework and provide "real-life" situations in which students practice skills they will use in future jobs. Deborah's syllabus, however, does not indicate students are given choices in the assignments or projects they complete and 80% of their final grade is based on exam grades, while the other 20% is based on quizzes and homework. This finding may suggest she does not offer students a variety of graded assignments to allow for failure, which is related with a belief in performance goals. This does not necessarily mean that her beliefs about motivation do not reflect in her practice, or that she practices an extrinsic belief about motivation, but rather, the syllabi analysis data do not strongly support her espoused beliefs for any of a variety of aforementioned reasons.

The interview data about Bobby suggest he tends to espouse motivational beliefs that are primarily intrinsic, citing the need to bring relevance to learning material and to increase students' sense of self-efficacy to increase motivation. Syllabi analysis data suggest Bobby may not offer students choices in their assignments or allow for student failure by providing a variety of graded assignments to evaluate student performance. The course syllabus Bobby provided for syllabi analysis indicated he bases 80% of a student's grade on exams and 20% on attendance and participation, which may suggest a belief in performance goals by not allowing for student failure. Interview data suggests Bobby attempts to elicit student curiosity and interest in the case studies he uses in class, but does not indicate how the case studies are scored or if they require out-of-class effort on behalf of his students; a finding his course syllabus does not clarify. For the course Bobby's provided syllabus represents, he did not require any out-of-class projects. As with Deborah, these findings do not suggest Bobby espouses an intrinsic belief about motivation and practices an extrinsic belief, but that the syllabi analysis findings do not strongly support his espoused beliefs for any of several different reasons.

Interview data suggest Jim espouses a behaviorist belief about motivation as he explains the only way he might motivate students is by providing them material to increase their exam grades, which suggests he uses extrinsic motivation in the form of rewards, such as higher grades. Syllabi analysis tends to support interview data findings, as the course syllabus Jim provided does not indicate he allows students choices in assignments or require them to complete any out-of-class projects. Jim's grading system places 90% of a student's final grade on tests and exams, and the remaining 10% is based

on attendance and participation, which may suggest a belief in performance goals. However, these findings have to be interpreted cautiously as they may reflect a lack of interview and syllabi analysis data, rather than his beliefs about motivation and how they may reflect in his practice of teaching.

Conclusions about Motivation

The interview data suggest a majority of professors espouse beliefs that support increasing student motivation by intrinsic means. Most professors espouse beliefs that suggest they show the relevance of material to increase student interest or promote self-efficacy of students to increase intrinsic motivation. Although a majority of award-winning and second-year professors espouse intrinsic motivation beliefs, interview data suggest more award-winning than second-year professors espouse such views.

Syllabi analysis findings are limited and tentative in that they attempt to compare beliefs about motivation in different contexts, use only one class per professor to base analyses, and may not accurately portray the ways professors attempt to influence motivation through assignments and evaluation. For the purpose of syllabi analysis, professors are believed to increase intrinsic motivation by offering students choices, allowing for failure, and eliciting interest and curiosity, while professors with a belief in extrinsic motivation might not account for these intrinsic motivators in their assignments or evaluations, but might seek to increase student motivation through grades and/or praise. Whether or not a professor allows for failure in their grading structure suggests whether they hold learning or performance goal beliefs, but the utility of these findings are limited, as they do not account for other ways professors' beliefs about these goals

may be evidenced. More research is needed to better relate professors' espoused beliefs and practices with learning and performance goals.

Considering the aforementioned caveat, syllabi analysis findings tend to suggest about half of the professors' practiced beliefs support intrinsic motivation and half of them support extrinsic motivation. Syllabi analysis findings do not strongly support the espoused beliefs of two award-winning professors whose interview data suggest a belief in intrinsic motivation. This finding does not suggest the professors' practice is not congruent with their beliefs, but that their practice, as measured in this study, may not accurately reflect their beliefs. Syllabi analysis findings tend to suggest that more second-year than award-winning professors espouse and practice intrinsic motivational beliefs although this finding is limited for reasons already mentioned.

Attention

The construct of attention is examined in this study along three perspectives: volitional, behaviorist, and cognitive. The volitional view of attention suggests attention is an act of will. The behaviorist perspective suggests attention is a functional relationship between a participant and his or her environment that is contingent upon reinforcement. The cognitive view of attention suggests it is a cognitive act that requires novelty and variety to be maintained. For the construct of attention, syllabi analysis does little to clarify or elaborate on the interview data because the professor-submitted course syllabi do not shed light on how professors maintain or increase student attention in the classroom. However, future research that directly observes professors in the act of teaching may offer much to help describe how professors' beliefs about attention reflect

in their practice. Due to this research limitation, I used only the professors' interview data to ascertain and describe their beliefs about attention as supporting the volitional, behaviorist, or cognitive view.

Espoused Beliefs – Attention

Interview data suggest a majority of professors use variety and/or novelty in the classroom to maintain attention, as suggested by Fulk (2000) and McKeachie (2000). These methods of maintaining attention are in keeping with the cognitive explanation of attention described by Henderson (2003). Eight professors indicate they use a variety of activities in the classroom, present information through different modalities, or vary their lecture techniques to introduce novelty and variety in the classroom. However, two of these eight professors also describe ways to maintain attention that suggest they espouse a behaviorist belief, such as providing consequences for inattention or providing attention contingent upon student attention. Two professors appear to espouse a volitional belief that suggests attention is an act of will and one of them also espouses beliefs that suggest he uses the behaviorist technique of providing consequences for students who do not attend well.

Novelty and variety. The following professors use different class activities and different ways to present material to introduce novelty and variety in the classroom. Several use group work or case studies as a means to add a variety of activities to the classroom, an idea Bruning (1994) proposes to maintain attention.

Deborah, an award-winning professor, describes how she maintains attention in the classroom:

Deborah [5]: I jump around. I don't intentionally talk loud, I just always have. I think voice projection is pretty important. You have to create as much interaction as you can. If I'm lecturing, then I'm always asking questions as I go. I stop and do a lot of class work assignments where they work in groups. But I think breaking the class up and not being all lecture or all hands-on, trying different things, asking people to put stuff up on the board. Those kinds of things help keep the students attention.

Barbie, an award-winning professor, echoes some of Deborah's sentiments and explains she limits how much she lectures and uses group work to maintain attention, which Bruning (1994) suggests adds variety to the learning situation:

Barbie [5]: To get them to pay attention I have to be really interesting when I lecture. I lecture not a lot, but not a little. They're never passive in my class. They're either taking notes when I'm talking or they're taking notes when there's a discussion going on because that's an important way of learning from each other, or they're working in groups of two with a topic that they may have to teach to the class and so they're working then. They're always doing something.

Bobby, an award-winning professor, explains he presents information in a variety of ways and uses case studies to maintain attention in class:

Bobby [5]: I use all kinds of techniques. The first thing I do is write things on the board in big letters even though they've got a schedule, headings, manuals, PowerPoint, whatever else I have. I believe in a lot of case studies in class. The other thing is that I say, "listen" – I learned this as a sales consultant – you say,

"Now listen, this is important!" and you pause and that gets them engaged. From verbal things like that to reviewing, constant reviewing.

Anna, a second-year professor, describes how she provides a varied experience in the classroom to increase attention:

> Anna [5]: Occasionally I say, "Okay everybody, listen up!" - that's one thing. I try to have them do activities or watch videos, try to mix it up. I try not to spend the whole class period talking and even if I'm talking, I'll try to engage them in examples to have them think about it. Like for a lecture on the brain, I'll have everyone imagine where things are so it's kind of more interactive, even if it's primarily me talking. It varies. The other Monday, I had them do yoga for three minutes to help them get focused.

Bianca, a second-year professor, discusses how she presents materials in different ways to maintain attention:

> Bianca [5]: I walk around a lot; I never stand still (laughs). Sometimes I will stand in front, but I feel like anytime I'm standing in the front, there's a barrier or something that says, "You students are here and I'm here," so I intend to walk around a good bit and my favorite is if I have something that I don't need to project and I can get everybody gathered around and we can look at something. They prefer that and I prefer that. If I could have everything be interactive I would, but I have too many things, so it's impossible to have true interaction with some things.

Three professors explain they interject variety into their lectures to maintain student attention by speaking loudly, avoiding a monotone delivery, or allowing for breaks during the lecture. These techniques also support the cognitive conception of attention as a construct that requires variety and novelty.

William, an award-winning professor, offers:

> William [5]: Somebody who sort of speaks in a monotone tends to put students to sleep pretty quickly, so I think that I'm blessed with having a loud voice. I mean, sometimes it's a curse that I'm not aware of how loudly I'm talking sometimes, but for teaching it is a blessing and it comes across as enthusiasm and that is a comment that comes across on my student evaluations very frequently.

Cognitive/behaviorist. Petra, a second-year professor, explains she gives her students mental and physical breaks to maintain attention, but also suggests her teaching attention is, at times, contingent upon student attention, which Henderson (2003) asserts may reflect a behaviorist view of attention:

> Petra [5]: Usually somewhere along the way, you break it up. You know, you go off on a tangent or you tell a story or you tell about your dog or something, but you break it up and give them a chance to go somewhere else mentally and then come back to it. Sometimes I just don't care. I've done things where if I can tell they're all really sleepy or nobody's with me, make them all stand up and then stretch and sit back down. If I do something like that, I'll go back and hit the highlights of what I've just said because nobody heard me. There are probably a lot of times that I just let it go and you teach to the ones that are paying attention.

Jim, a second-year professor, states he moves around the room and uses voice projection to maintain attention, but also explains a method to maintain attention that suggests the use of public consequences for those who do not attend:

> Jim [5]: I'm pretty animated, I guess. I'm loud, not intentionally loud; I'm just generally kind of a loud person. I use a very open, almost Socratic method where I constantly call on people in class. I probably don't go 5 or 10 minutes in any class without engaging at least one of the students in the class, simply because I'm guessing – what I was brought up to believe – that they can only pay attention for about 20 minutes at a time anyway. So, I kind of keep the class going in small ups and downs in 10-minute intervals. I'll walk around the room and I'm pretty much in the class, within arm's reach of each student in the class at least once. I walk around the class the whole time and I call on them if they look like they're dozing off. I memorize everybody's name the first day of class and I start calling on them.

Jim's statements suggest he attempts to create a varied learning environment, which he creates by moving around the room and speaking loudly. However, his statements also suggest he provides consequences for students who do not pay attention, which may suggest he also holds a behaviorist view of attention, such as those posited by Barkley (1996) and Halperin (1996). Petra, like Jim, describes the use of both cognitive and behaviorist means to maintain attention, which may suggest their beliefs about attention are based on both views.

Volitional and volitional/behaviorist. The following excerpts describe the practices of two professors who appear to think student attention is strongly tied to personal interest and suggest it is a student's responsibility to maintain attention, which reflects the description Reason (1984) conveys about attention as an act of volition:

Brad, an award-winning professor, explains how he maintains attention in the classroom:

> Brad [5]: In terms of capturing an individual's interest, I don't have a magic cure or bullet for maintaining an individual's interest. I've had students every semester who are not interested and they are doing it simply because the course is required, to achieve some professional or personal goal that they have and I may get to change some individuals, in terms of their perceptions, level of interest, but some individuals have entered not interested and some of those individual's have exited the class still not interested.

Brad immediately draws a connection between interest and attention. His response suggests he thinks he may have some influence on a student's interest, but he strongly implies attention is contingent upon interest, which may suggest a belief that attention is an act of volition, such as described by Reason (1984). Brad appears to imply that if a student is interested in the class of their own accord, the student will pay attention.

The following excerpt suggests two different beliefs about attention:

> Cecil [5]: A big obstacle is getting them to pay attention and drawing out the ones who don't. Some students are just naturally interested in the subject, make

themselves pay attention or whatever, but drawing out the ones who don't is harder.

Jeff [5-f]: How do you draw out the ones who aren't paying attention?

Cecil [5-f]: Oh, you know, I try to call on them by name. That's always an easy fix, I think. If they just totally look spaced-out, I either ask them a question or I'll use their name in an example a lot of times. I find if you use their names it's a little signal to them like, "Alright, I guess I've got to be with this."

Cecil's statement that students can "make" themselves pay attention suggests he believes attention is an act of volition. However, Cecil also explains he singles students out by name to maintain attention, which suggests he uses consequences as well, which is aligned with a behaviorist belief about attention. Cecil's statements about how he maintains attention suggests his beliefs may reflect both volitional and behaviorist views of attention.

Conclusions about Attention

Interview data suggest six professors, four of whom are award-winning professors, espouse predominantly cognitive beliefs about attention. These professors explain they use different class activities, lecture techniques, or different modalities of presenting learning material, in an attempt to provide variety or novelty in the classroom to maintain student attention, which suggests they hold a cognitive view of attention.

Interview data suggest two professors, both of whom are second-year professors, espouse statements that suggest they use both cognitive and behaviorist methods to maintain attention, which suggests their beliefs about attention might be based on both

views. These professors discuss their use of providing variety in their lecture techniques to increase attention, but also reward student attention with professor attention, or provide public consequences to students who do not pay attention.

Interview data suggest one award-winning professor espouses a volitional belief about attention, while one second-year professor appears to espouse beliefs that suggest a belief about attention based on the volitional and behaviorist views. Group findings suggest more award-winning professors than second-year professors espouse beliefs about attention that support the cognitive paradigm. More second-year professors espouse behaviorist or volitional beliefs about attention than award-winning professors. The only professors who espouse beliefs that support multiple paradigms are second-year professors.

The findings about professors' beliefs about attention are limited because only one method of data gathering was employed in this research. Therefore, the results presented suggest further research is needed to more fully explore professors' beliefs about attention.

Memory

In this section I examine professor interview data for evidence of the beliefs about memory professors hold, and I analyze professor-submitted course syllabi to discover evidence that might estimate how their beliefs about memory reflect in their practice of teaching.

Memory is a very complex cognitive construct and professors may find it difficult to elucidate their beliefs about memory in general. Because of this, I examine the

memorization demands professors make of their students, as revealed by interview data. The statements about memorization professors espouse may allude to their beliefs about memory in general. To determine professors' beliefs about memory as reflected in their practice of teaching, I examined professor-submitted syllabi for evidence of the types of in-class and out-of-class activities and assignments they provide their students. The activities and assignments a professor requires of his students may, as Henderson (2003) suggests, allude to the type of belief about memory a professor has.

The research of Cooper et al. (2002) suggests professors' beliefs about memorization may be understood as a cognitive act that falls along a continuum of importance as it applies to understanding. Their research proposes professors' beliefs about memorization may fall along a continuum such as the following:

- Memorization as a "minimal role" in learning (such as rote memorization in order to reproduce facts).
- Memorization as a "stepping-stone" in order to advance one's learning.
- Memorization as a "key-part" of learning, used to build knowledge, even expert knowledge.

A key difference between the stepping-stone and key-part descriptions of the use of memorization is the stepping-stone description does not imply facilitation of long-term recall or development of expert knowledge without more learning, while the key-part description encapsulates both ideas.

To evaluate interview data, I use the continuum proposed by Cooper et al. (2002) to categorize professors' memorization demands as supporting a minimal, stepping-stone,

or key-part role in student learning, which carries assumptions about the function of memory. I consider the beliefs about memory that may underlie professors' memorization demands in order to categorize their beliefs as cognitive or behaviorist. For example, a professor's statements that suggest the use of memorization as a minimal role or stepping-stone to learning, may hold a belief in memory, such as that of Bruning (1994), who posits memory is a reconstructive process based on making connections between old material and new material. This description is congruent with a cognitive view of memory. Henderson (2003) proposes professors with this view of memory may attempt to help make new material meaningful and memorable to facilitate understanding. A professor might attempt to accomplish this by using class activities and out-of-class assignments that might engage student thinking and enhance deep processing of material, which research suggests promotes long-term learning and better recall by students (Bruning). Concerning the degree of detail that memories are stored, the cognitive view of memory is most aligned with the "gist" variety of memory storage suggested by Bruning. While the memorization demands a professors makes of their students do not specifically address the degree of detail in which memories are stored, there appears to be an inference that can be drawn between a belief in memorization as a minimal role in learning and the gist variety of storage discussed by Henderson.

A professor who describes the use of memorization as a key component of learning may support a belief that suggests a different understanding of the process and function of memory. A professor with a behaviorist view of memory as a cognitive act enhanced by repetition and rehearsal may support a key component description of

memorization. Henderson (2003) suggests professors who hold a behaviorist type of belief may require and expect different abilities of their students, such as the ability to commit large amounts of information to memory and to recall information in a very detailed manner. The behaviorist paradigm suggests these abilities are aided by repetition and rehearsal. A behaviorist belief in memory is also aligned with the knowledge transmission orientation to teaching and may be linked with a "detail" variety of memory storage, whereby memories are believed to be stored in great detail and possibly verbatim. While memory storage is not directly addressed in the interview questions, one can infer that a professor with a key component belief of memorization may likely believe that memories are stored in great detail or verbatim.

To compare the beliefs professors espouse about memorization with the beliefs revealed in syllabi analysis, I examined course syllabi for evidence of the types of in-class and out-of-class assignments they require of their students. As Henderson (2003) suggests, a professor with a cognitive view of memory may attempt to engage students in thinking and try to encourage students to make new material meaningful and memorable through the class activities and out-of-class assignments they provide for their students.

The behaviorist view of memory suggests that the repetition of learning material and minimizing distractions in the learning environment should be sufficient for learning to occur. The behaviorist paradigm of learning is aligned with the knowledge transmission orientation to teaching discussed by Prosser and Trigwell (1999). This implies a professor with a behaviorist belief of memory might believe that the learning material (knowledge) a professor presents to students may transmit more or less directly

to a student's long-term memory. Therefore, a professor with a behaviorist understanding of memory may not believe it is necessary for students to engage in in-class and out-of-class assignments but, rather, that students need to read and re-read assigned readings and lecture notes to commit information to memory.

To undertake syllabi analysis, I examined course syllabi for evidence of in-class activities and out-of-class assignments that might attempt to engage students' working memories, which cognitive psychologists tend to define as temporary storage facilities where information is held while it is elaborated on and later stored in long-term memory. Activities such as cooperative learning activities, case studies, lab activities, or other means may be considered to engage students' working memories. These learning and teaching methods may reflect professors' beliefs about memory, as they can be viewed as ways to engage student thinking and also suggest ways professors impart information to students (i.e., knowledge transmission or learning facilitation). The ways professor impart information to students certainly carry implications about how professors believe student memory serves the learning process. Professors whose course syllabi suggest a knowledge transmission orientation to teaching may likely hold a behaviorist view of memory, whereby information is "transmitted" to students without a need for students to actively reconstruct material. A professor with a learning facilitation orientation to teaching may likely hold a cognitive view of memory, as the learning facilitation orientation suggests students need to adopt a "deep and achieving" approach to processing information, which Bruning (1994) suggests is essential to transforming and

reconstructing old information into new information; an idea that supports the cognitive view of how memories are created and stored.

Describing professors' syllabi analysis data as supporting either a cognitive or behaviorist belief about memory allows one to estimate how much the beliefs professors espouse about memory reflect in their practice of teaching. As with the other constructs studied in this research, this method of analysis is not without limitations. The interview data about professors' memorization demands do not directly or explicitly convey their beliefs about memory per se; it only suggests the beliefs about memory that may underlie the professors' beliefs about memorization. Comparing professors' espoused memorization demands with the beliefs about memory that syllabi analysis suggests does not allow for a direct comparison of professors' beliefs about memory. Comparing the beliefs revealed by interview and syllabi analysis data only allows for an estimate of their beliefs and an approximation of how congruent their beliefs are to their practice.

Espoused Beliefs – Memory

In terms of the memorization continuum proposed by Cooper et al. (2002), most professors espouse memorization demands congruent with a category of the continuum which describes the use of memorization as a stepping-stone to learning, which parallels the cognitive view of memory in that it implies the need to connect new information with old information as suggested by Bruning (1994). The interview data suggest a majority of professors espouse beliefs about the role of memorization in learning that suggest a cognitive view of memory.

Memorization as a stepping-stone. Brad, an award-winning professor, discusses memorization as a "first-step" toward understanding:

> Brad [6]: The memorizing of something, while maybe functioning as a first step toward understanding something, doesn't communicate a great deal of understanding of the concept. So, I'm interested in individuals being able to use the stuff. I'm more interested in your ability to develop a good survey instrument than your ability to list 15 things that you should and shouldn't do in developing a survey.

Brad then explains how memorization facilitates the comprehension, or understanding, of material:

> Brad [6-f]: The basic knowledge has to be there, whereas if memorization is the way you accomplish the foundational knowledge, then that's fine and then once you have that foundational knowledge, you have to translate it into something that has meaning. You have to attach meaning to it and I think at the point, comprehension takes place – when you attach meaning to it.

Cecil, a second-year professor, describes memorization in the following excerpt as a stepping-stone to deeper understanding:

> Cecil [6]: I'll lead with some definition, which is a little boring and then have them present some examples so that, hopefully, they can kind of internalize it at a certain point and then they forget that original definition, which is fine, but then they have some sort of deeper understanding.

As in the interview with Brad, Cecil describes memorization as a means to acquire a deeper understanding of a concept. This implies the two believe memorization serves as a conduit to deeper processing, which cognitive researchers associate with long-term retention and recall.

Barbie, an award-winning professor, describes how memorization is necessary, at first, for learning information, but becomes "internalized" after students apply it:

> Barbie [6]: Memorization plays some part – just know dates or they have to know the seven parts of classical oration in order to be able to use it and employ it, but once they use it, they see the sense of it. It doesn't just become empty memorization once its put into play, once it's employed and utilized and, again, brought to life. But prior to that, its just information, but it's information they have to have. It's knowledge; it's what they need, and then they can know how to use it, then they do and it's not memorized; it becomes almost second nature.

In this excerpt, Barbie, too, explains the need for students to memorize some information, but indicates memorization leads to deeper learning once applied. This suggests Barbie believes memorizing information leads to learning and using information in a way that becomes "almost second nature" once applied, which suggests the information is deeply processed.

Barbie's explanation about the use of memorization echoes the statements of several other professors. It also suggests the memorization of original facts or information transforms them into something greater than mere facts of information. This implies information is transformed into knowledge beyond the original facts memorized,

an idea Cecil parallels in his statement, "...they forget that original definition, which is fine, but then they have some sort of deeper understanding." Bruning (1994) suggests information is, indeed, transformed as it is transferred into long-term memory.

Jim, a second-year professor, expresses the need to memorize and keep information in short-term memory in order to build upon the information, which suggests he believes memorization is useful only as a stepping-stone to learning:

> Jim [6]: There are things you have to sort of memorize and keep in short-term memory for as long as the semester, so you can build on them, but memorizing everything for an entire class and just repeating it shows no comprehension.

William, an award-winning professor, explains memorization is necessary in some instances and hopes it leads to a conceptual understanding of the material. He equates understanding with long-term retention, which he explains reflects in a student's test performance. William offers:

> William [6]: I like to think the mathematics I cover are conceptual and that it's not strictly a memorization of symbols. Now, there are times when we learn procedures to do something and I hope that the procedure is meaningful, but occasionally you just have to learn to do it, but hopefully the memorization leads to an understanding of the concepts that goes with what they're memorizing. I think if somebody's just learning a rote procedure without understanding, they might be able to spit it back on a test, but they're not going to retain it for very long and it doesn't do them much good and that's the kind of student where you'll see grades on final exams going down. So, what's more important is an

understanding of what's happening. There's memorization and there's understanding and understanding beats the memorization 100 to 1. That's really what's important, the understanding of what's going on...

William clearly expresses a concern that memorization does not lead to a deep understanding of conceptual material but may, optimally, lead to a greater understanding of the concepts he teaches, facilitating long-term retention as a result.

Deborah, an award-winning professor, also discusses the need for some memorization, but indicates its purpose is to build upon what her students are learning:

Deborah [6-f]: There are a few formulas that I give them that are not intuitive and I say, "You just have to memorize this." I feel like I'm getting away from some of the memorization, so I'll tell them, "You've got too much up in your head that you've got to memorize like telephone numbers, so I don't want to take up more space." I want to build on what we're learning...

Deborah notes some things have to be memorized, but explains memory storage is limited and does not want to further tax it with excessive memorization demands. She implies memorization serves to build a base from which to learn material.

Bobby, an award-winning professor, suggests memorization is an acceptable stepping-stone towards learning, but emphasizes students need to be pushed further to engage and apply the material to different situations and contexts. This implies memorization by itself is not sufficient to deep processing. Bobby offers:

Bobby [6-f]: I think that memorizing gets my students pretty far down the road of my classes. I think we have a responsibility as faculty to try and push our students

a little farther, to try and get them to engage and really try to learn something and the meaning of how that might apply to a different situation later.

The interview data of these professors describe beliefs about the function and purpose of memorization in varying degrees of detail. Each of the professors expresses or implies the use of memorization is necessary, at times, but is not sufficient to produce long-term understanding or deep processing of material. The beliefs professors espouse about the purpose of memorization fall along the continuum Cooper et al. (2002) propose under the minimal-role or stepping-stone classification, which suggests they support a cognitive view of memory because it implies the need to connect new information to old information for memorable learning to occur.

In these instances, for example, one can view the memorized material as old information upon which new material, such as the more important conceptual material, is attached and then stored in memory. The interview data of many professors support this idea as they describe the use of memorization to "build a base" from which conceptual understanding follows, thus, transforming old information into new, as cognitive theory suggests.

Memorization as a key-component. The following two professors, who are second-year professors, indicate memorization is necessary to learn the material they teach and imply it is sufficient to produce learning, which supports the key-part category of the memorization continuum proposed by Cooper et al. (2002). Again, an important distinction about this category of the continuum is the professor believes, or implies, memorization facilitates long-term learning or expert knowledge, which does not require

connecting old and new material. A student's ability to memorize information in great detail appears necessary to fulfill this type of memorization demand, which is aligned with the behaviorist view of memory. Therefore, the memorization demands the following professors have of their students suggest a behaviorist view of memory. It should be noted that in Bianca's case, the material she suggests must be memorized is very domain specific and may only reflect her beliefs about memorization as they apply to one particular class she teaches. These results should, therefore, be interpreted very cautiously.

Bianca, a second-year professor, explains the need for memorization in learning course material:

> Bianca [6]: The hardest subject in terms of memorization is Anatomy. There really is not much way to get around learning the various muscles, ligaments and other structures in the body without memorizing what they are.

This statement suggests Bianca believes memorization alone, as suggested by the key-part category of the continuum proposed by Cooper et al. (2002) is a viable means of learning material and also implies the need for repetition in committing a large amount of information to memory. As mentioned, Bianca's statements may only reflect her belief about memorization specific to the subject of Anatomy.

One second-year professor, Anna, describes a use of memorization that suggests it is a key-part of learning and requires rehearsal and repetition, which is associated with the behaviorist paradigm of learning:

> Anna [6]: It [memorization] is important [to learning in her class]. Hopefully, a lot of it goes on without having to sit down and rehearse, but I think that you also do have to sit down and rehearse. I give them all a set of learning objectives and also a vocabulary list and part of the reason is both of those things help them prepare for tests...giving them the vocabulary list, in a way, gives me freedom because if we don't cover all of the vocabulary topics in class, they still they have to learn them. So, some of that stuff they can just go look up and do more of a "dictionary approach" to learning.

In this excerpt, Anna explains students need to memorize and rehearse material in order to learn. Perhaps more importantly, Anna explains part of her class structure may entail a "dictionary" approach towards learning, a solution she proposes if she does not cover all of the vocabulary topics in class. While she does not describe this as her primary method of teaching, her statement alludes to a belief that memorization is a viable means of learning, one that probably entails repetition, which is implied in the "dictionary approach" she describes. One can argue this finding suggests a behaviorist view of memory. However, these findings are limited by the methods employed in this study and may not accurately allude to her beliefs about memory in general.

One professor's beliefs cannot be categorized as cognitive or behaviorist. Petra, a second-year professor, indicates her memorization demands are dependent upon which course she teaches and how she decides to approach teaching and testing in each course. Her approach to structuring these courses, in terms of memorization requirements, is similar to other professors that place significant memorization demands on their students,

but is also unique because she sometimes does not make any memorization demands of her students. Petra offers:

> Petra [6-f]: They [students] can use note cards [during tests] with formulas or definitions or example problems or verses from the Koran or whatever they want on that note card; I don't care. I don't think they have to memorize in Statistics at all. In the Operations course, the way I did it the first semester I was here, it was rather important. The next two semesters, it wasn't important at all and it's been somewhat important this semester in Operations.

Petra's excerpt indicates she makes different memorization demands of her students, which are related to the types of test formats she uses and how she structures each class. This suggests her beliefs about testing are strongly related to her beliefs about memory in general. Not only does this imply her memory beliefs influence her testing practices, but also that her beliefs about memory support both the cognitive and behaviorist views of memory. Because of the ambiguous nature of Petra's beliefs about memory, as they reflect in her memorization demands, her interview data are not amenable to precise categorization.

Although a large majority of professors espouse views about memorization that suggest they hold a cognitive view of memory, the use of syllabi analysis may provide greater clarity to the beliefs they espouse and indicate both how their beliefs reflect in practice and how congruent they may be to their espoused beliefs.

Syllabi Analysis – Memory

To undertake syllabi analysis, I examined professor-submitted course syllabi for evidence of in-class activities and out-of-class assignments that might attempt to engage student thinking and encourage a "deep and achieving" approach to learning, such as cooperative learning activities, case studies, lab activities, presentations, or other means that may engage students.

The results of syllabi analysis suggest the majority of professors reflect a cognitive view of memory in their practice of teaching, as assessed via syllabi analysis. This finding appears to support the findings of the interview data, which suggest the majority of professors in this study espouse beliefs about memorization that can be construed to support the cognitive view of memory.

Syllabi analysis findings suggest nearly all of the professors attempt to utilize activities or assignments designed in such a way that they appear to attempt to engage student thinking. For example, Brad (an award-winning professor) requires his statistics students to review and analyze a research project and report on their findings. This assignment suggests he attempts to have his students do more than merely learn how to compute statistics, but to also have them engage in outside material that is relevant to the class and to apply their understanding of what they have learned in a practical application. Brad espouses statements about memorization that suggest he holds a cognitive belief about memory, which syllabi analysis tends to suggest is supported in his practice of teaching. Although not a direct comparison, Brad's espoused beliefs and practiced beliefs, as estimated by syllabi analysis, suggest congruence between the two.

Although the course syllabus of William (an award-winning professor) does not describe out-of-class assignments, other than working math problems for homework (which may or may not engage student thinking), his syllabus indicates students actively work in groups in class, which suggests an attempt on William's behalf to use teaching methods that are believed to engage a student in thinking. These syllabi analysis findings tend to support William's espoused beliefs about memorization, which suggest a cognitive belief about memory.

Syllabi analysis suggests similar findings for nearly all of the other professors who espoused cognitive views about memory. This finding tends to suggest that the professors who espouse a cognitive belief about memory, as estimated through their statements about the memorization demands they require of their students, reflect those beliefs in their practice of teaching by attempting to engage students in thinking. Syllabi analysis suggests these professors use methods and assignments such as: cooperative learning activities, in-class case studies, out-of-class writing assignments such as reflections on reading material, and book and research reviews to actively engage students.

Interview data suggest Jim, a second-year professor, supports a cognitive view of memory. In his course syllabus, there is no evidence of out-of-class assignments or in-class activities, other than the use of the lecture format. While the lecture format could be construed to engage student thinking, depending on how the lecture is structured (such as with discussion or other techniques to make it "active"), Jim's syllabus does not suggest how he utilizes the lecture format. While these findings may suggest Jim's practiced

memory beliefs are not in line with his espoused beliefs about memory, they do not necessarily suggest he practices a behaviorist belief about memory. The syllabi analysis method employed in this study did not find evidence of congruence between Jim's espoused and practiced beliefs. As previously mentioned, the interview and syllabi analysis findings do not allow for direct comparisons between the two, but offer an estimate of congruence instead.

Two second-year professors, Bianca and Anna, whose espoused beliefs may suggest a behaviorist view of memory, do not appear to practice beliefs that reflect those views. As previously mentioned, Bianca's statements about the memorization demands she makes of her students were based on only one class she teaches and may or may not accurately reflect how she approaches and teaches all of her classes. Therefore, Bianca's statements should be interpreted cautiously as they may be domain specific.

Syllabi analysis findings suggest both teachers employ a variety of means to engage student thinking, such as group work, presentations, and case studies. Additionally, Bianca's syllabus indicates students do a great deal of lab work, which might be considered to engage student thinking as well. These findings suggest both she and Anna tend to exhibit a belief about memory in their practice that appears to be in line with the cognitive view of memory. These findings appear to suggest that these professors' beliefs about memory are not congruent in belief and practice. Again, because one cannot directly compare the interview data against the syllabi analysis data, only an approximation of congruence can be estimated.

As with Petra's interview data, syllabi analysis cannot precisely categorize Petra's practiced beliefs about memory because they were specific to her approach in teaching a particular section of the same course. Syllabi analysis suggests that her practiced beliefs are congruent with her espoused beliefs, as evidence was discovered that suggests she holds both a cognitive and behaviorist view of memory. In one section of a course she teaches, syllabi analysis found no evidence of in-class or out-of-class activities that seem to attempt to engage student memory. Another section of the same course includes several activities such as group work, research projects, and presentations, which may attempt to engage student thinking. Therefore, Petra's interview and syllabi analysis data suggest her beliefs and practices are congruent.

Conclusions about Memory

Interview data suggest the majority of professors espouse beliefs about memory, as ascertained through interview responses, which support a cognitive belief in memory as a reconstructive process that requires connections between old and new material to create meaning. These beliefs may also suggest professors might only expect students to code and recall the gist of learning material, rather than have verbatim coding and recall.

The interview data suggest more award-winning than second-year professors espouse beliefs about memory that suggest a cognitive view of memory. However, one of the second-year professors offered statements about memorization that may be domain specific and might not reflect her overall beliefs about memory. Another second-year professor espoused beliefs that appear to support both the behaviorist and cognitive views of memory, which does not allow for precise categorization.

Syllabi analysis data tend to suggest a majority of professors reflect beliefs about memory in their practice that appear to support the cognitive view of memory. Because the cognitive view of memory proposes students need to actively reconstruct information to make it memorable and enhance long-term recall, professors who provide in-class and out-of-class activities, other than lecture and note-taking, promote student thinking and exhibit a learning facilitation orientation to teaching. The promotion of student thinking and exhibition of a learning facilitation orientation to teaching are aligned with the cognitive view of memory; therefore, one can infer that professors who evidence these views in their practice of teaching may practice a view of memory aligned with the cognitive view. Syllabi analysis also suggests that while a majority of all professors in the study reflect a cognitive belief about memory in their practice, more award-winning than second-year professors hold this belief. Due to the limitations of this study and its findings on professors' beliefs about memory, more research is clearly needed to more fully examine this area.

Learning Strategies

In this section I examine professor interview data for evidence of professors' beliefs about the learning strategies of their students and how they might attempt to capitalize on, as well as help students utilize, different learning strategies. I analyze professor-submitted course syllabi to discover evidence that suggests how their beliefs about learning strategies might reflect in their practice of teaching.

As Henderson (2003), McKeachie (2000), Nolen (2003), and Shakarian (1995) suggest, students use a variety of cognitive strategies and learning styles to learn material.

Henderson suggests professors should capitalize on those strategies by providing activities that encourage their use or directly teach students cognitive strategies. To determine how professors' beliefs about learning strategies might reflect in their teaching, I examine course syllabi for evidence of the type of activities and assignments they provide their students. The types of activities and assignments professors require of their students may reflect their beliefs about learning strategies and whether or not it is important for students to engage with learning material in a variety of ways. Examining both interview and syllabi analysis data will not only aid in ascertaining the beliefs about learning strategies professors hold, but will also help estimate how much their practice reflects the beliefs they espouse.

Espoused Beliefs – Learning Strategies

A majority of professors state they try to help students use effective learning strategies, gear teaching toward different learning styles, use a variety of teaching methods/activities to capitalize on different learning styles, directly teach cognitive skills such as metacognition, or help students discover their own learning preferences.

Helping students learn/use learning strategies. Anna, a second-year professor, discusses how she helps students learn more effectively:

> Anna [7-f]: I'm attentive to the issue that different people learn in different ways, so I try to vary things and also to get them to learn about their own learning styles so they can exploit that and right now, the most formal way I do that is to give them an extra-credit opportunity to take a learning styles questionnaire on the web and then use what they learn from it to create a study guide and turn that in for

extra credit. I try to use visual and kinesthetic information to help some people for what it's worth.

This excerpt suggests Anna believes students' learning styles influence how they approach learning. Anna encourages her students to learn about how they learn in order to use learning styles and strategies best suited to them. Anna also explains she teaches to those with different learning styles in the classroom, such as visual and kinesthetic learners, as suggested by Nolen (2003).

Bianca, a second-year professor, discusses specific strategies she offers students to help them better comprehend learning material:

> Bianca [7]: I have a number of students who read, write, read, write; everything they read, they write in their notes, which having done that as an undergrad, I recognized after a while I was just reading a sentence, writing a sentence, writing down...almost copying. That's not good. "You're not going to learn anything from that. You're better off to read a page, summarize what you just read on the page or go paragraph by paragraph." If they can summarize then it's up to them to put it in their own words, which I think requires a lot more cognitive effort and may help enhance their learning.

Different teaching modalities. Bianca also explains she teaches toward different learning styles, which suggests a belief that students may benefit from approaching learning in different ways:

> Bianca [5-f]: I'll try to make things as visual as possible. We do try to get an idea of what learning styles the students have. With the students I advise, I do ask

them what learning style they prefer, if they read something, hear something, write something, or see it and hear it. I would say 90% of the students who come in prefer to see and do something, so we try to incorporate a good bit more laboratory time. I try a lot of different ways and if it works – do it.

In the following excerpt, Deborah discusses how she attempts to engage different learning styles by using a variety of teaching methods, a means of capitalizing on different learning styles suggested by Henderson (2003):

Deborah [2-f]: I know that we've got an interactive generation, but I don't think a 20-minute lecture is bad, especially if it fits into what you do. So what I try to do is I will talk for a while, and then we'll be hands-on and we'll be working problems and stuff, but I try not to get up in front of the classroom and talk for an hour and 15 minutes.

Bobby discusses using case studies in class, which Shakarian (1995) suggests promotes active learning and may benefit a student who responds well to different learning methods:

Bobby [4-f]: I believe in a lot of case studies in class and they are very difficult for undergraduates to do – to think about how to apply the material and then take it one step farther. It's working pretty well now for students, but it's taken me 8 or 9 weeks to take them to that thought process.

William encourages his students to engage in material in different ways such as co-operative learning, which Nolen (2003) suggests may benefit certain types of learners:

William [7]: I really encourage the students to use the Math lab just to get together, even if they don't need help with tutoring. It's a place they can go, environmentally, to study where there are other people, hopefully, who enjoy what's going on and working together.

Petra, a second-year professor, also offers her ideas about student learning styles and how she approaches them in her teaching:

Petra [7-f]: I was 35 years old before I realized that people's brains don't work the same way and although I reached that revelation, I wonder if I don't still fall back into that? You know, "I think this way, this is my logic, therefore, everyone else must think in this manner too." There are a couple of ways in Statistics where you can reach the same conclusion through different ways and they're all just as valid. But when I teach, I probably assume that everybody learns the same way I do. I know that there's a big difference between what I know and what I do, okay? With that caveat, I know that in order to teach one thing to everybody, you've got to do it a couple of different ways or you have to be able to help people learn in their own way, but on a day to day basis in the classroom, I doubt that I do that.

In the above excerpt, Petra acknowledges a belief that students utilize different learning strategies, as well as a belief that material should be taught in different ways. However, as she explains, the awareness of what she *should* do does not always reflect in her actual practice.

Teaching/suggesting learning strategies directly. Petra explains how she encourages students to think about how to approach solving problems; a statement that suggests she attempts to promote metacognitive abilities in her students:

> Petra [7]: Before I put a formula or a problem solving technique up on the board, I sometimes ask, "How do you think we could calculate this?" or, "How do you think we could solve this?" or, "What are the things you think would be required to do this?" and you can get them thinking a little bit in the right direction.

Cecil, a second-year professor states the following suggestions he offers his students:

> Cecil [7]: As far as studying, I always tell them to take section headings and make questions out of them. So, if there's a section heading that says Independent/Dependent Variables then you could say, "what is an IV, what is a DV?" If you know the answer, then you're probably okay.

Cecil's advice to students appears to suggest he tries to help students use metacognitive strategies, such as McKeachie (2000) offers, in order for them to study and learn more effectively.

Barbie offers the following about how she helps students organize material to learn more effectively, assistance that tends to suggest she attempts to foster metacognitive strategies in her students:

> Barbie [7]: I tell them, "Don't just write down the stuff I put on the board because I'm not masterful at board work." I put down stuff to help them organize. I give

them rubrics so they see the method to the madness and they see where it is going and they can use it as a kind of outline.

These interview excerpts reflect the various ways many professors appear to capitalize on and foster different learning and metacognitive strategies in their students.

Jim, a second-year professor, explains the suggestions he gives students to help them become more effective learners. While probably useful to students, they do not suggest he attempts to foster the use of various learning strategies in his students:

Jim [7]: [On what suggestions he offers student to help them learn effectively] Read the book; come to class. I really do. I really harp on my students to read the book and come to class and I guarantee that I've never failed somebody that's done both.

This interview finding does not suggest Jim fails to address or support different learning strategies his students may employ or need to employ but, rather, may reflect a lack of data that accurately allude to his beliefs about learning strategies.

Brad, an award-winning professor, offers study guides to help his students prepare for tests, but indicates he does not offer specific suggestions to students about how to learn or study more effectively. He offers:

Brad [7]: I don't have any "Uncle Brad's Helpful Hints" or, "study this way type of thing," but, especially before the first exam in the class, I will go over the kinds of questions that are asked. I'll even have sample test questions that we go over, so that students understand the kinds of questions that are asked. I give study guides so that they recognize that the material that is going to be on the exam are

the kind of things that we covered in class, but as far as "You need to memorize these three things" or, "The way to do this is this way" – no, I don't do that.

Brad's interview data do not suggest he fails to account for different learning strategies or learning styles students employ, but tend to suggest he does not "direct" students in how to go about learning or studying. As with Jim, it is possible that the interview data do not accurately reflect Brad's beliefs about learning strategies. The uncertainty or limitation involved with assessing a professor's belief about something based using only interview questions underscores the need to use multiple methods of research to better understand professors' beliefs. Therefore, the utilization of syllabi analysis may serve to more fully flesh out the professors' beliefs, as well as estimate how congruent their practiced beliefs are with their espoused beliefs.

Syllabi Analysis – Learning Strategies

To undertake syllabi analysis I analyzed professor-submitted course syllabi to discover evidence about how professors' beliefs about learning strategies might reflect in their practice of teaching. The process of syllabi analysis also serves to approximate congruence between professors' espoused and practiced beliefs.

I examined professors' syllabi for evidence of in-class and out-of-class assignments and activities that might suggest how professors capitalize on and provide opportunities for students to actively engage with learning material in a variety of ways. The teaching methods and activities a professor utilizes may reflect professors' beliefs about learning strategies and how important the professor may or may not feel it is to teach toward or foster different learning strategies. For example, a professor who does

not make outside requirements of students, other than reading and/or taking notes, may not offer students a variety of ways to actively engage with material. Similarly, a professor who limits in-class activities or teaching methods to one type, such as a lecture-only format, might not capitalize on the various learning strategies a student utilizes. However, this method of data collection is limited because it provides only a partial view of what a professor might do to capitalize on students' learning strategies.

Syllabi analysis findings suggest the majority of professors provide a variety of in-class and/or out of class activities that serve to capitalize on different learning strategies students use, as well as provide students opportunities to use different means of engaging with learning material. The findings also suggest all of the professors who made statements that suggest they try to help students use effective learning strategies, gear teaching toward different learning styles, use a variety of teaching methods/activities to capitalize on different learning styles, directly teach cognitive skills such as metacognition, or help students discover their own learning preferences, appeared to reflect these statements in their practice of teaching. There is evidence of congruence between belief and practice as the findings suggest these professors espouse and practice beliefs that indicate they are aware that students use a variety of learning strategies. Therefore, they afford students opportunities to use different learning strategies and ways to engage with learning material.

Syllabi analysis findings suggest the majority of professors provide a variety of in-class and/or out of class activities that serve to capitalize on different learning strategies students use.

In the examination of professor-submitted course syllabi, Deborah, Barbie, William, Cecil, Bianca, and Anna, appear to provide a variety of activities with different learning modalities, both in and out of class. For example, William explains in his course syllabus that students will sometimes work in groups during class and also advises his students to participate in the Math Lab as a cooperative-learning experience. Cecil's course syllabus details students will sometimes work in groups during class and also provides for a research project, both of which may provide students different perspective from which to engage with learning material. Anna provides many different in-class and out-of-class activities, such as group work, group projects, presentations, and out-of-class writing assignments, which also appear to provide a variety of different learning perspectives for students. Syllabi analysis suggests the course syllabi of these professors, as well as the other professors noted, support their espoused beliefs about learning strategies and tend to suggest congruence between their beliefs and practice.

Syllabi analysis indicates Bobby does not require outside assignments or activities of students (other than an implied reading of material), but his syllabus shows his students undertake case study analysis in the classroom, which suggests he provides for a variety of perspectives from which students can activate different learning strategies. This finding tends to suggest his practice of teaching is congruent with his espoused beliefs.

Jim and Brad's interview data were inconclusive and did not provide evidence of how they attempt to support learning strategies in or out of the classroom. However, syllabi analysis suggests Brad utilizes an out-of class assignment that requires students to analyze research. This assignment might capitalize on different learning strategies

students employ, which suggests a different perspective by which his students can engage with learning material. This finding does not suggest his practice is incongruent with his beliefs. Syllabi analysis indicates Jim's course syllabus, like his interview data, does not provide evidence of a variety of in-class or out-of-class activities. Additional data may better support or refute these findings.

Syllabi analysis findings suggest Petra provides for a variety of in-class and out-of-class activities in one section of a course she teaches. However, a syllabus from another section of the same course does not provide this variety of activities. Petra's espoused beliefs about learning strategies suggest she supports the use of different learning strategies, but syllabi analysis indicates her beliefs are not clearly reflected in practice. The uncertainty of these findings suggest the implementation of additional methods of research, such as direct observation may help one better learn about and describe the beliefs of professors and how their practice reflects those beliefs.

Henderson (2003) suggests professors' beliefs about learning strategies may or may not be related to their beliefs about memory. Henderson further explains evidence of the types of in-class and out-of-class assignments and activities professors utilize may be connected to their beliefs about memory. Interview and syllabi analysis data suggest the majority of professors in this study hold and practice beliefs about memory that appear congruent with the cognitive view of memory as a reconstructive process requiring students to actively engage with learning material to facilitate learning and long-term memory recall. Interview and syllabi analysis data also tend to suggest professors believe that students benefit from undertaking learning from a variety of perspectives. Professors

who provide a variety of learning activities that capitalize on, as well as encourage the use of, a variety of learning strategies may view learning as an active process that benefits from actively engaging with learning material in different ways. This suggests a parallel between beliefs about learning strategies and memory. This also suggests professors who hold a cognitive view of memory encourage the use of different learning strategies to promote learning and long-term recall of learning material.

Conclusions about Learning Strategies

Interview and syllabi analysis data suggest the majority of professors provide a variety of in-class and/or out-of-class activities that serve to capitalize on different learning strategies students use. Interview data indicates a majority of professors try to help students use effective learning strategies, gear teaching toward different learning styles, use a variety of teaching methods/activities to capitalize on different learning styles, directly teach cognitive skills such as metacognition, or help students discover their own learning preferences. Syllabi analysis findings suggest the majority of professors utilize a variety of in-class and/or out of class activities in order to capitalize on the different learning strategies students use.

Group findings tend to suggest the same amount of award-winning and second-year professors espouse beliefs about learning strategies. Syllabi analysis data suggest more award-winning than second-year professors attempt to capitalize on various student learning strategies, as reflected in the assignments and activities they describe in their course syllabi. Syllabi analysis suggests an equal amount of award-winning and second-year professors practice beliefs that are congruent with their espoused beliefs. As with the

other constructs examined in this study, the findings on learning strategies are limited and indicate a need for more research to better ascertain professors' beliefs about learning strategies.

Additional Findings

Interview data analysis suggests a common theme emerges about how professors structure and support the learning environments of their students and how the learning environment they construct affects a student's emotional state. Bain (2004) suggests students' emotional states are very important to their learning. Fraser (1993) indicates many educators believe the importance of the learning environment, which includes its climate, ambience, tone, and atmosphere, is vital to student learning.

Louis Schmier (2005) notes that it is important for professors to utilize empathy in the classroom to create an environment of warmth and safety for students so they fully reach their potential. Schmier explains how a professor creates and supports a student's learning environment influences how well they learn and how much they realize their potential as a person. This statement is rife with implications about the influence professors can have on their students, both positive and negative.

Several professors note the way they respond to student questions is extremely important for creating and maintaining a good learning environment. Although not a direct cognitive influence on learning, several professors explain an emotionally cold or negative learning environment is detrimental to student learning.

William, an award-winning professor, suggests the way he responds to student questions shapes the learning environment in his classes. He offers:

William [10-f]: I want students to ask questions whenever there is something that's not clear, so part of my task is to let students know – and they're pretty quick to determine whether the professor welcomes questions or not – they learn that pretty quickly. So, my hope is it's an atmosphere where students can answer questions and then if I ask a question of students, that I get their feedback and that they feel that they can answer without having the fear of being jumped on.

William discusses the effect of a professor's treatment of students upon student motivation, participation, and interest:

William [9-f]: I still think that a teacher can turn students off and for those students who have marginal or some motivation, a teacher can turn that spigot completely off. So, I think internal motivation is important – in math it is critical – but I also think that the faculty's treatment of students is very important, so they do go hand in hand. If the teacher seems to not care about the class or not care about the students in the class, I think students will perceive that. If a student asks a question and the teacher treats that question rudely, that student might not ask the question again even though on down the road the question might be very valid, a very good question that needs to be asked, but it may be left unasked. As a matter of fact, the student may decide, "I'm not interested in this class anymore."

Bobby, an award-winning professor, describes how he creates a good learning environment by being genuine and how he attempts to make an emotional connection with his students. He relates these activities to motivation:

Bobby [8-f]: I think an interpersonal connection has to be made. I think they'll see…I use the word all the time, "genuine," I'm genuinely interested in them learning and I'm genuinely interested in sharing with them what I know and what will help them be successful. I let them know that they can open their mouths and say something wrong and I won't blow them out of the water. There are two plains – there's the emotional plane and the substantive plane, the facts – you're not going to get to the mind until you get to the heart and I truly believe that.

Deborah, an award-winning professor, explains she gets to know her students and supports them emotionally to make the learning environment in her classes better. She believes these activities increase motivation:

Deborah [8-f]: I really love the bit about having my majors – they're my kids, they are my other family and I'm real sad when they all graduate. I start getting to know them when they're juniors and then I have them some that year and on through their senior year. That's one of the things I love most about teaching; I think the more I get to know the student, the better the learning environment. I think that if I know them personally, they try harder. I think students need to know that you care about them – not just learning about what you're teaching, but as a person.

Bianca, a second-year professor, discusses the importance of building trust with her students so they can experience a positive learning environment:

Bianca [8-f]: I took a lot of time and energy to develop a level of trust with them, so that they know they could come to my office and tell me anything, like, "I

really wasn't getting anything out of this today; I don't understand it," or if they have suggestions about what could've been done to make that a better situation for them to learn, more facilitating. There's a real high level of respect in the class and that means a tremendous amount to me.

While the emotional state of a student is not a cognitive process of learning, the professors' statements about the importance of creating a positive learning environment, engaging students on an emotional level, and creating trust with students, certainly alludes to the vital importance of a student's emotional state in the context of cognition and learning.

Because of the influence of emotions and environment on learning, the professors' statements about how they enhance relationships with students and create a positive learning environment are robust. While it is not within the scope of this study to fully explore this area, these findings support the need for more research in this area, particularly research about student learning and cognition in relation to emotion and learning environment.

Chapter V

Discussion

In this study I have described the beliefs that professors hold about the psychological constructs of motivation, attention, memory, and learning strategies. I have described professors' espoused beliefs about these constructs and how their practice of teaching may reflect them. I examined interviews and syllabi to explore congruence between professors' espoused beliefs and their practice of teaching. In this section I discuss these findings, suggest the limits of this study, and provide suggestions for future research. Table 1 summarizes the themes that emerged from the data.

Beliefs about Motivation

The construct of motivation was examined in this study in terms of intrinsic and extrinsic motivation, and learning and performance goals. The majority of professors in this study espouse beliefs about motivation that suggest they try to increase their students' intrinsic motivation in a variety of ways.

Several professors state they try to increase students' intrinsic motivation by explaining the relevance of learning material in order to make it interesting and relevant to students' lives and careers. The research of McKeachie (2000) and Eccles et al. (1998) suggest methods like these increase students' intrinsic motivation.

McKeachie (2000) and Eccles et al. (1998) suggest that enhancing students' sense of self-efficacy also serves to increase intrinsic motivation. Several professors state they

Table 1

Emergent Themes

Motivation
Relevance
Self-efficacy
Curiosity and Interest
Grades and/or Praise or Consequences
Attention
Novelty and Variety
Mixed-view Cognitive/Behaviorist
Volitional and Mixed-view Volitional/Behaviorist
Memory
Stepping-stone view of memorization
Key-component view of memorization
Learning Strategies
Help students learn/use learning strategies/styles
Use of different teaching modalities
Directly teach or suggest learning strategies to students

attempt to increase students' feelings of mastery in what they learn and their sense of self-efficacy in order to increase their motivation.

A few professors in this study espouse beliefs about motivation that suggest a behaviorist view of the construct. Eccles et al. (1998) describe motivation as a series of biological drives that are satisfied by the behaviors that are reinforced most, which become habits. The professors with a behaviorist view of motivation cite grades and praise as increasing student motivation, a method Henderson (2003) suggests professors with a behaviorist orientation to motivation might utilize.

Syllabi analysis findings suggest half of the professors in the study offer students interesting assignments and activities to capture their interest and elicit curiosity, offer choices in assignments they are required to do, and allow for student failure by providing a variety of ways for students to demonstrate learning, which increases intrinsic motivation (Crocker & Nuer, 2002 and Henderson, 2003).

For the most, syllabi analysis findings suggest professors' practice is congruent with their beliefs. Group findings suggest more second-year than award-winning professors hold beliefs that are congruent with practice, but the limitations of this research call into question the validity of that finding.

Information about learning and performance goals obtained in this study is limited, but syllabi analysis findings suggest that professors with a behaviorist view of motivation do not tend to allow for student failure in the way they structure their class, which suggests a relationship with performance goals (Crocker & Nuer, 2002 and Henderson, 2003). Conversely, syllabi analysis findings indicate professors with a

cognitive view of motivation tend to allow for student failure, which suggests a relationship with learning goals.

Beliefs about Attention

The construct of attention was examined in this study along three perspectives: volitional, behaviorist, and cognitive. Reason (1984) explains early philosophers believed people had to exert their will to pay attention to things were not novel or interesting to them. Henderson (2003) asserts professors with a volitional view of attention may, indeed, believe students can exert their will to pay attention. As discussed in Barkley (1996), the behaviorist view of attention suggests paying attention is not an act of will, but a functional relationship between a participant and their environment that is contingent upon reinforcement. Halperin (1996) explains cognitive psychologists believe attention is based on cognitive processes, which can be voluntary or involuntary, that respond to novelty and change in the environment and result in attending.

Interview data suggest a majority of professors in this study use a variety of techniques to introduce novelty and change in the classroom. This finding suggests most of the professors in this study hold a cognitive belief of attention. Henderson (2003) suggests teachers who hold a cognitive understanding of attention may attempt to create novelty and variety in the classroom to support selective attention. Many professors in this study use a variety of class activities, present information through different modalities, or vary their lecture techniques to introduce novelty and variety in the classroom, as suggested by Fulk (2000), McKeachie (2000), and Bruning (1994) to help students pay attention.

Two professors describe ways to maintain attention that suggest they espouse a behaviorist belief about maintaining attention, such as providing consequences for inattention or providing attention contingent upon student behavior. One professor espouses a volitional belief that suggests attention is an act of will, and two professors appear to hold a mixed-belief about attention, cognitive and behaviorist, and volitional and behaviorist.

Group findings suggest more award-winning than second-year professors espouse beliefs about motivation that suggest a cognitive view of attention. The only professors who held views related to the behaviorist belief of attention, or mixed-belief views, were second-year professors. The only professor who espoused a volitional view of attention was an award-winning professor. These findings may be tenuous and suggest more information is needed to better ascertain professors' beliefs about attention.

Syllabi analysis was not utilized to ascertain professors' beliefs about attention because the professor-submitted syllabi do not provide a means of determining these beliefs.

Beliefs about Memory

The construct of memory was examined in this study in terms of professors' beliefs about memory storage and recall, and professors' beliefs about the role of memorization in the learning process.

Bruning (1994) posits memory is a reconstructive process based on making connections between old material and new material. Henderson (2003) suggests professors with this view of memory may attempt to help make new material meaningful

and memorable to facilitate understanding. This view may be congruent with the learning facilitation orientation to teaching described by Prosser and Trigwell (1999). Henderson asserts a common view of memory professors may hold is that memory works like a tape recorder and stores information in a more or less verbatim form. This view may be associated with the knowledge transmission teaching orientation and the surface approach to learning described by Prosser and Trigwell, which tends to support the behaviorist paradigm of learning.

The cognitive view of memory is most aligned with the "gist" view of memory storage, as Bruning (1994) suggests people tend to "recall the gist of passages rather than verbatim content" (p. 9). Henderson (2003) suggests professors who hold a behaviorist type of belief may require and expect different abilities of their students, such as the ability to commit large amounts of information to memory and to recall information in a detailed manner.

Concerning memorization, the research of Cooper et al. (2002) suggests professors' beliefs about memorization may be understood as a cognitive act that falls along a continuum of importance as it applies to understanding. The continuum provided by Cooper et al. was utilized in this study to conceptualize and describe professors' beliefs about memorization—beliefs which likely allude to their beliefs about memory in general. For the purposes of this study, professors whose statements suggest a belief about memorization as having a minimal or stepping-stone role in learning are considered to hold a cognitive belief about memorization, while professors who express a belief

about memorization as a key component of learning are considered to hold a behaviorist belief about memorization.

I examined professor-submitted course syllabi for evidence of in-class activities and out-of-class assignments that attempt to actively engage student thinking, such as cooperative learning activities, simulations, or case studies, activities that Henderson (2003) suggests engage students in thinking. Professors whose course syllabi provide evidence that they make such attempts to engage students in thinking support a learning facilitation orientation to teaching and a cognitive view of memory, while professors who do not make such attempts exhibit a knowledge transmission and behaviorist view of memory.

The interview data suggest a majority of professors in this study believe memorization has a minimal role in, or serves as a stepping-stone to, learning, which suggests a cognitive view of memory. Several professors discuss the need to tie new information to old information, as suggested by Bruning (1994) and Henderson (2003) to help students remember new learning material. The majority of professors explain the use of memorization is necessary, at times, but is not sufficient to produce long-term understanding or deep processing of material.

Interview data suggest two professors believe memorization is necessary to learn the material they teach and imply it is sufficient to produce learning. This supports the key-part category of the memorization continuum proposed by Cooper et al. (2002), which is aligned with a behaviorist view of memory. One of these professors provides information about her memorization demands of students that may be domain specific, so

the findings about her should be interpreted very cautiously and may not accurately allude to her beliefs about memory. While the other professor made note of utilizing a "dictionary approach" to learning at times, and stated memorization is important and necessary for students who take her class, these results should also be interpreted cautiously because they also may be domain specific.

Syllabi analysis data suggest nearly all of the professors in this study reflect a cognitive view of memory in their practice of teaching. Professors design activities or assignments to attempt to engage student thinking. Many professors use activities such as research projects, cooperative-learning activities, in-class case studies, out-of-class writing assignments, and book and research reviews to actively engage students.

Pertaining to storage and recall, the syllabi analysis data also suggest professors support a "gist," rather than "detail" belief about memory storage and retrieval (associated with the cognitive view of memory and the learning facilitation orientation to teaching) and may only expect students to code and recall the gist of learning material, rather than have verbatim coding and recall (associated with the behaviorist view of memory and knowledge transmission orientation to teaching.

Group findings suggest more award-winning than second-year professors espouse and practice a cognitive belief about memory. Considering the limitations of the data collection methods employed in this study, this finding should be interpreted with caution and may be an artifact of data collection methods. Because this finding comes up on a few occasions, though, it may reflect the teaching experience and expertise award-winning professors have accumulated during their careers.

Beliefs about Learning Strategies

This construct involves professors' beliefs about the learning strategies of their students and how they might attempt to capitalize on or help students utilize different learning strategies. I also analyzed course syllabi to discover evidence that suggests how their beliefs about learning strategies reflect in their practice of teaching.

Henderson (2003) suggests students use a variety of cognitive strategies and learning styles to learn material and asserts professors should capitalize on this by providing activities that encourage their use or directly teach students cognitive strategies. The types of activities and assignments professors require of their students reflect their beliefs about learning strategies and whether or not it is important for students to actively engage with learning material in a variety of ways. Shakarian (1995) explains teachers may use a variety of active learning strategies such as: cooperative/ collaborative learning, simulations, role-playing, debate, peer teaching, and case studies to match teaching method with a student's preferred learning style.

Interview data analysis suggests a majority of professors in this study state they try to help students use effective learning strategies, gear teaching toward different learning styles (as suggested by Shakarian, 1995), use a variety of teaching methods/activities to capitalize on different learning styles (as suggested by Nolen, 2003) directly teach cognitive skills such as metacognition (as suggested by McKeachie, 2000), and/or help students discover their own learning preferences.

I examined professors' syllabi for evidence of in-class and out-of-class assignments and activities that might suggest how professors capitalize on and provide

opportunities for students to actively engage with learning. Syllabi analysis findings suggest the majority of professors in this study attempt to provide a variety of in-class and/or out of class activities that capitalize on different learning strategies students use and provide students opportunities to use different means of engaging with learning material. Syllabi analysis shows professors provide activities that utilize different teaching modalities, opportunities for cooperative-learning, and a variety of ways to engage with material, such as writing and preparing presentations.

Syllabi analysis findings also suggest there may be a relationship between professors' beliefs about learning strategies and there beliefs about memory. Syllabi analysis suggests that professors who hold a cognitive view of memory encourage the use of a variety of learning strategies to promote learning and long-term recall of learning material, but there is not enough data to infer a similar finding about professors with a behaviorist view of memory.

I believe that the findings of this study are rather encouraging. The vast majority of professors espouse beliefs about the learning constructs examined in this study that suggest they are well-informed about these matters for the most part. Many of the professors' espoused beliefs and practices revealed in this study seem to support the research that cognitive psychologists have provided about learning over the years. The attempt at ascertaining how professors' beliefs reflect in practice generally produced results that suggest professors' espoused beliefs are fairly well reflected in their practice of teaching. Although the methods employed in this study are limited, they tend to suggest that professors are "practicing what they preach"—most of the time.

Limitations of this Study

One limitation of this study is that it does not fully capture all of the beliefs professors may hold about the psychological constructs examined in this research. For example, interview data do not provide information about schemata, which is an important part of memory reconstruction.

Another limitation is that the methods employed do not allow for direct comparison of espoused and practiced beliefs. As a result, comparisons of professors' beliefs using interview and syllabi analysis data only allowed for inferences to be drawn and estimates to be made about how professors' beliefs reflect in their practice of teaching.

Professors' beliefs about the construct of attention were gleaned from interview data only and may be less robust as a result of coming from only one source.

The syllabi analysis data gathered in this research were based on only one course. Therefore this may have provided evidence of teaching practices that are highly domain specific or not representative of the professors' usual practices.

Course syllabi were the only documents analyzed in this study. Examining additional documents, such as tests or exams, may provide additional evidence of professors' practiced beliefs.

Suggestions for Future Research

Future research endeavors might include direct observation of professors to more fully ascertain how professors' espoused beliefs about student learning relate to their practice.

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Appendices

Appendix A

Sample Transcript

This transcript has been reproduced using the pseudonym of William that was assigned to the participant. The "J" stands for the researcher's name, which is Jeff.

J: Tell me about a time when your students were really learning what you wanted them to.

W: This semester in a Linear Algebra class we were covering some concepts which are related, I won't mention the terms – I know they won't mean a lot to you – but closely related concepts of linear independence and what is the basis for a vector space and what's a spanning set. They're tied together but there are subtle distinctions and it takes students a while to learn them and so for the first time I had tried an activity that I had not done before, in which I gave them a true/false quiz – normally for a major test, I don't like to use true/false very much. Occasionally, I will or some reason in Linear Algebra I tend to use it where I don't in other classes, but this was deliberately a T/F quiz to make them think about what are the questions and what are the issues here. So, it wasn't a tricky thing, but it was some questions to force them to think about the definitions that they were working with. Half the credit came from their individual answers then after that I said "okay, now the next part is as a class you have to come to consensus" – it's a

small enough class-15 to 16 students in there so that they can have a class discussion and come up with class answers, so half of the credit came from their own individual answers, which they couldn't change once they got in class discussion part, but then class discussion – whatever the group would determine to be the answer, was the other half of the question and I was pleased with the discussion that went on there, where people that missed the question were willing to ask "well why is this" and others could answer it. So, I could tell from the discussion that happened – through comments that were made – that yes, a lot of people really knew what was going on and I felt that they could explain it – they had an opportunity to explain it to their colleagues when one of them said "hey, well why is this one false" so I was pleased with that.

J: What was it about that particular event that you think the students responded so well to?

W: Partly it relies upon the personality of the class. I could've tried this experiment with another class that I had in mind and I think it would have flopped because if it's a class that's very quiet and the students aren't willing to speak up, then it wouldn't work, but what happened here – first I had to get a volunteer for someone who would be the class...the person to lead the discussion and right away somebody said "I'll do it" and wasn't someone who normally makes A's, but it's somebody who had confidence in himself and is willing to go out on a limb and they have a lot of fun with each other, so

the personality of the class allowed them to discuss and joke around and have a good time with it and I think that made it a success.

J: Have there been other instances…it sounds like part of the group dynamic is what made this a particularly successful class time. Have you used any similar types of things in other classes?

W: I frequently – if the class size and room allow for it – I would like to get groups of students at the blackboard – this has to mean that I have lots of floor space because I'm in a small room, I can't do this, but it's often the case that I will have groups of students go to the board in groups of 3 or 4 a piece and in groups work together on some sort of problem. And, again, whether that goes well or not depends on the students as much as me. I sometimes have groups – this semester in my Math 135 class…that's a course for business majors – it's part statistics and then a little bit at the end, there's an Algebra portion with the ideal or ideally getting the notion of what is the derivative of a function. So, statistics and then functions and rates of change and there are points in time in the Algebra part of the course where I will have them…had them get into groups this semester just to work on some problems, then we had group discussion afterwards. And I think from one class to another, it worked better in my second class than in my first class just because of the nature of the students. So, yeah I think the students themselves are a big factor to whether an exercise works for them or not.

J: What kind of students do you need to have for stuff like that to work?

W: Students who are willing to take a risk to talk and so part of that does go back on the faculty member. The instructor has to set up an environment to create trust where students are willing to speak out or if they're working in groups, they have to work with friends. If there's somebody who…I imagine there could be individual people who could make a group dynamic not work. Number one, they have to be people who are willing to talk and willing to listen – flipsides of the coin – and respect other people and I pretty much don't have a problem with that happening. I think once students get involved in a class, particularly if there seems to be a grade involved, as long as there is something there to make them be involved in the work, I think that encourages things to go better, but yeah…so there's that. It certainly helps if students are involved in the class to begin with. If they come in and…if someone's missed 3 days of class and don't know what's going clearly can't contribute as much as somebody who's been doing homework and what not, so that's a big factor there too. Have the students been doing their bargain of the work – keeping up with the homework and trying to learn the material as they go along.

J: Tell me more about the environment of the class. How is it that you try to structure things?

W: The basic class structure is that I use the lecture format as the primary mode of teaching. Now, by lecture that doesn't mean just me talking with no interaction from the students, let me be clear on that. A lot times I'm lecturing on a problem and I say "okay, what's the next step", so I use leading questions and what not to have a discussion lecture, but I will have the majority...most of the classes, I'm leading a kind of lecture to introduce problems and my objective is to make material clear. Along the way, I want students to ask questions whenever there is something that's not clear, so part of my task is to let students know – and they're pretty quick to determine in which the professor welcomes questions or not – they learn that pretty quickly. So, my hope is it's an atmosphere where students can answer questions and then if I ask the question of students, that I get their feedback "what'd you get on Question #3", that they feel that they can answer without having the fear of being jumped on. But basically I do a lot of lecture/discussion with some activities if I can fit some in or as I feel they would work one and I try to make it an atmosphere where students feel it's okay to make a mistake, but they should be involved enough to try and that I'm really interested in them learning the material and I expect them to have an interest in learning the material too.

J: How do you know or how can you tell that your students are learning?

W: Of course the big one is what happens when I give them a test (laughs) – so that gives me some feedback. Another kind of feedback that's just along the way, you can at least tell if students are engaged in the class when you look out at the class – is everyone

yawning? And there are times when I can tell the class is wandering and there are times I can tell "yes, they're really with me." In a longer class period – and hour and fifteen minute class – sometimes it just comes to the point where "um, I think we need a five minute break – let's stand up for a minute and stretch." There's that kind of feedback; I do feel that most people, whether they want to acknowledge it or not, can tell whether students are paying attention. Now, that doesn't necessarily mean students are learning everything you want – you don't know what's sinking in, but at least you know something is happening if they're paying attention. Then feedback from tests and then, it might be even if there's a question that comes from a student that might really show "oh, I wasn't really expecting that kind of question." It can be something really good or it might show that there's something I really need to address here – to question it another way to find out what the students are learning or what's in their mind.

J: Okay. By the same token then, how do you know if they're not learning?

W: Okay, by the same things – the flipsides, so if I'm grading tests and getting grades of 30's and 40's, then something didn't happen there that I was hoping would happen. If I'm looking around and there's a lot of people yawning, that's...well, maybe the environment is not very exciting and again, sometimes a question can be very good because it can indicate great thinking on their part. Sometimes a question can communicate a student hasn't grasped something that you thought they should already know – that you need to go back and address something.

J: What kind of question would indicate that they are learning?

W: Going back to Linear Algebra – I'll mention that because it's a course I'm teaching right now, having recently talked about what's the basis for a vector space – bases are not unique. If I asked for what's the basis of the vector space for 2x2 matrices and somebody gives me the answer I'm looking for and somebody else says "well, could we use this as a basis?" and the one that they suggest is correct, then probably there is good thinking that is going on there and that they maybe brought something creative to the thought, not giving me the standard kind of answer that I'm looking for. So sometimes...and I do have one particular student in mind whose whole goal is to give me a correct answer that is not what I'm looking for (laughs). So if I say somebody give me a number that we can start with that I'm looking for like 5, 6, or 7 – he'll say "pi." And that's sort of fun having a student like that to keep me on my toes.

J: Tell me about a time when your students were enthusiastic about learning.

W: Recently in a Calculus class that I was teaching, I had one of those days that I had them up at the blackboard for maybe half the class period, where I was giving them some problems to do – maybe it was some problems on doing derivatives or something like I gave them a graph and they had to do something with it – I don't remember the exact exercise we were doing, but I do remember I went from group to group to group and as

soon as each group got one particular question, I said "okay, here's the next one to work" and I continued to work around the room and was busy the whole time and at the time I didn't think anything special was happening, but in class somebody just mentioned to me "gee, this was a really fun class." You could take that two ways – one way you could take that is class is normally not fun, but I really think that she meant it was more fun than usual and it's not often that I student tells you that they enjoyed a class – I mean it's nice when that happens. That to me, just that comment, made me feel very good about that particular day and I thought that something must have happened there that went well…at least for that one student.

J: Tell me what types of things you do to help your students pay attention in class.

W: I guess a big thing is that I try to make sure that my explanations are clear. Now, clarity is not the same as being exciting, but if I lose the student along the way…if you get lost and you don't follow something, then pretty quickly you can tune it – things can get boring if you don't know what's going on. So I think the first step is to make sure students are with me when I'm trying to explain something – to be as clear as possible. "Why are we going from A to B?" I try to show enthusiasm for mathematics when I teach and I think that makes a big difference. Somebody who sort of speaks in a monotone tends to put students to sleep pretty quickly, so I think that I'm blessed with having a loud voice – I mean sometimes it's a curse that I'm not aware of how loudly I'm talking sometimes, but for teaching it is a blessing and it comes across as enthusiasm and that is a

comment that comes across on my student evaluation very frequently. One of the questions is something like "Is the teacher enthusiastic about the course?" or something and I get very good responses on that, so students at least perceive me to be enthusiastic about mathematics and I think that keeps them in-tuned.

J: What kind of demands do you place on a student's ability to memorize in your classes?

W: Hmm...good question. There are...I like to think the mathematics I cover are conceptual and that it's not strictly a memorization of symbols. Now, there are times when we learn procedures to do something and I hope that the procedure is meaningful, but occasionally you just have to learn to do it. Sometimes there are definitions that just to be learned and this is in higher level, even as you go up in high-level mathematics – you take an advanced calculus analysis class, you just have to spend time learning that there are precise definitions that lead to the proofs of what's going on and you have to have those under your belt, so there are parts of mathematics where memorization is important, but hopefully the memorization leads to an understanding of the concepts that goes with what I'm memorizing. I think if somebody's just learning a rote procedure without understanding, they might be able to spit it back on a test, but they're not going to retain it for very long and it doesn't do them much good and that's the kind of student where you'll see grades on final exams going down. So what's more important is an understanding of what's happening. There's memorization and there's understanding and understanding beats the memorization 100 to 1. That's really what's important – the

understanding of what's going on and when I grade it's different – if the students are doing a process and along the way they make an arithmetic mistake but they're doing the correct work, they get almost all credit – it might be minus a half or minus one. If I feel like they're writing something down that they were trying to memorize, but if my take on what I'm grading is they don't understand what's going on, then they lose a significant amount of work. So there is a place for memorization, but for mathematics in particular...what we're really after as faculty is being able to think and understand what you're doing and being able to work logically.

J: What do you think it takes then for the student to retain what they're learning versus something rotely memorized? You kind of distinguished between the two.

W: For retention...and I'm going to veer away from your question a little bit. For retention in mathematics, practice...well, actually this does address your question. About every night, I assign homework on what's been covered in class and questions should make students think...and it's wrestling with the problems – and I'm dealing with mathematics, in other disciplines in might be wrestling with reading something or it might be wrestling with writing something, so there's different ways that teachers try to engage students outside the classroom to think about what's happened in the past lesson or maybe to prepare them for what's coming up – but it's students involvement in the work, in the case of mathematics, it's typically working math problems and wrestling with what are the issues of involved in math problems that will make them understand

what's going on and be able to retain it. A student who comes to class...there can be sharp student who come to class and who understand without any effort what's going on in the classroom, but I think that they ultimately hurt themselves and I think that they might even in the short run do fairly well on tests by just studying and thinking about their notes and not doing any homework problems, but I think it will eventually catch up with them. Sometimes it takes getting to a higher level, maybe they can do it that way at a 100 level class and then at the 200 level class they find "whoops, I can't do this" – but at sometime it will catch up with them.

J: Do you give your students any suggestions or tips to help them become more effective students or learners?

W: At the very beginning of the semester...this is something I've tried for the first time this semester based on I went to a syllabus workshop given by the Faculty Center and one of the ideas they suggested was to give a syllabus quiz and I've never done it before, but in all my classes the very first assignment was to go to my course webpage and I have an expanded syllabus with more stuff out there and I just ask some questions on here and this was an easy "A". All you had to do was spend time looking at the syllabus on the web and answer questions about it and turn it in – like the first week of class. So, I right away try to get them to go to my website and see what's out there and to be familiar with it. I talk about the math lab that, in addition to my office hours or times – whenever my doors open, students are welcome to come see me. I try to get the idea across that I'm

open. But I really encourage the students to use the Math lab just to get together – even if they don't need help with tutoring – it's a place they can go environmentally to study where there's other people, hopefully, who enjoy what's going on and working together. So I try to encourage right up front the notion that homework is very important and even though most of it is not graded, it's still not an optional thing. If they want to learn then they need to be doing the homework. So I encourage them to use the Math lab, let them know I'm available outside of class if I'm needed, although one of my goals in teaching...ideally, I'd like to think that my lessons are so crystal clear and so perfect that when they do the homework, things just fall into place and I'm not needed outside of the classroom – not that doesn't happen. Up front I really try to encourage students to get on the right track, keeping up with the class. That's a big part of it. I know there's another faculty member in another department who said that just being there is a big part of the game and he uses attendance as...you could view it punitively, but uses attendance as a factor in the grade and a number of different things that go on.

J: You were talking about homework...how important is a student's outside contribution?

W: Extremely important and as I said, there can be bright students who initially – and they are lower level classes – might unfortunately might be able to get by and be able to do pretty well by just coming to class and spending minimal effort outside of class, but eventually I think it will catch up with them sometime or another and I think that no

matter what the discipline – whether it's working problems in mathematics, whether it's reading literature in your literature class and thinking about what's happening, whether it's writing...whatever's going on – whatever assignments are made, that's a critical part of learning.

J: Tell me something you do to motivate your students to learn.

W: Well, in any class where you're giving tests – I mean that's a "stick" kind of motivator as opposed to a "carrot", but a test...knowing that there are tests throughout the class, I typically give 3 tests in addition to the final exam...knowing that they will be tested, even if the student is getting behind or what not, when test time comes that sort of puts the pressure on you to go back and "now I've really got to sit down and look over this last bit of material and focus on it." So tests are a big motivator – I think at least for those who take grades seriously, it's a motivator.

J: Now what about the students who might not be particularly motivated by tests or grades – you mentioned there might be something...?

W: Yeah, I don't know...if there's a student who's not motivated...sometimes there are students who just drop out of the picture and what could I have done to keep them on board? I don't know. Every semester there are some of those and I hope that there are not many, but there are some. You see, you don't know what you can do to reach different

people and I don't know what other faculty...that'd be something interesting to find out – what do you do to motivate students to learn, other than tests and the grading system that we have and I don't know. I think that basically with each student, the amount of motivation they have is intrinsic to them and assigning grades is a way that maybe – a marginal bit – may encourage students to become more motivated, but I don't think there are students who make an "A" who would not learn anything if there were not the test there. I think what it is...is that you have a certain amount of motivation and a test can help bump that up a little bit, but the motivation is either already there or isn't.

J: Tell me about a time when your students seemed very motivated.

W: I would say in a lot of classes, whenever there is an animated discussion going on – that's motivation. When they're taking a test sometimes, motivation happens right then (laughs). Sometimes that's a little too late. Sometimes students are more interested in learning something in the middle of the test than they were before. So, going back to the example with my Calculus class and my students were working together in groups of four – I can look back on times when I've done exercises like that with my students and I felt like they really were involved, so I'm going to equate involvement with motivation. I don't know that that's necessarily one in the same always, but when the students are involved, I think they're motivated and for some reason they're being involved. I can see that at times when I have students working in groups or at the board or even on a particular day and we're working certain problems and if I'm asking "what do we next"

and there are certain students who are really with it and really answering, there's a motivation there.

J: Tell me about how you evaluate student performance and why.

W: My evaluation is based on tests, homework, quizzes, and final exam. There have been times when I have also had a class participation grade as a minimal thing – I find that's harder for me to evaluate and when I have taught Math 101 – that's a Math for majors not requiring a particular Math class, I know I've had to have a project in there, that's part of the liberal studies…when we designed the class, we said there will be project component, but basically it is there written work on tests and homework, quizzes, and exams.

J: How important is it to cover all of the material that you decided you wanted to at the beginning of each semester?

W: That depends on whether the course is a prerequisite for a follow-up course or not, so in Calculus 1, we're expecting to get from Part A to Part B. In Calculus 2 – it picks up at some point and if I don't get to the last 3 or 4 sections and those sections are critical for Calc. 2, I've done a tremendous disservice to those students, so therefore I do think it's important for me as a faculty member to have some idea of what are the most critical sections and to make absolutely sure I cover them and then to realize "here are a couple of things that I can let go of if I have to." In our Math 135 class it's a prerequisite for

Management 235 and so I try to make sure that all the faculty members…for some reason I sort of got involved in that…in the development of that, so each semester I make sure the faculty members know "if you don't cover the functions and rates of change parts of the course, don't get up to derivatives – that's okay. It's not acceptable not to cover this chapter in the Statistics textbook because they're using the same textbook and they're going to pick up at the next chapter." So I let them know "hey, it is absolutely essential that you cover this material – it is less essential…if you have to have some give and take there's some other material that you can give up." I do think content is important though. There are some people who feel that the process of teaching and what's more important is not how much you cover, but what students take away in their memory of how thing interacted…well, in Mathematics, for a number of courses I do think there is some agreement out there among the Mathematic community – that a Linear Algebra class will have this in it and that an Abstract Algebra class will cover this much and if you're covering significantly different amounts of material then I think there's a problem there.

J: What do you hope that your students take with them after having had you as a professor?

W: The number one thing…after saying all this talk about content (laughs)…the main thing is that I want them to be able to look back and say "well, I enjoyed that mathematical experience." Whether they were a good mathematics student or not, I hope that they left with a good taste in their mouth from the class. Now beyond that I do also

hope that they've learned a lot of the mathematics that was involved and I knew students have different tracks – for some students, what I'm teaching might be their terminal course and in that case, the particular content that they leave with might not be as important as for somebody, for example, some of our students go on to graduate school in Mathematics – well, the particular content I'm covering I think is very important for them and then somewhere in the middle are students who might use some things from my class in another class and I like it when that happens. I do remember one time when I was still a graduate student at Clemson and I was teaching Calc. 3 for the first time and there were certain types of things that I was teaching and I had…I was learning them as the students were and I really had no idea where that would be useful, but later on student who was in Electrical Engineering said "you know, those surface integrals and stuff that we did, I have used that in my other classes." I really appreciated him telling me that. So, number one I like students to leave with a good taste in their mouth – their last mathematical experience, whatever it was, was a good one. Number two, I would like them to have whatever content they need and for some students that might not be very much, but others it might be a lot, but whatever content they need for their next step, whatever their next step is, that's what I'd like them to learn.

J: You were talking about students with internal motivation and their ability to learn in the absence of a faculty member's personal concerns. How important then is the teacher to students that are highly, internally motivated?

W: I still think that a teacher can turn students off and for those students who have a marginally or some motivation, a teacher can turn that spigot completely off, so I think the internal motivation is important – in math it is critical, but I also think that the faculty's treatment of students if very important so they do go hand in hand.

J: And that's what you mean then by "turning it off?"

W: Yes.

J: How would a teacher turn off a student's motivation?

W: If the teacher seems to not care about the class or not care about the students in the class, I think students will perceive that. If a student asks a question and the teacher treats that question rudely, that student might not ask the question again even though on down the road the question might be very valid – be a very good question that needs to be asked, it may be left unasked. As a matter of fact, the student may decide "I'm not interested in this class anymore." So you never know what you can say or not say that has an influence on a student's attitude and I do think that faculty members do have an influence on some students more than on others.

J: Thanks a lot. Is there anything else you'd like to add?

W: I think that's about it.

Appendix B

Informed Consent Form

Principal Researcher: Jeffrey Hart

Faculty Advisor: Dr. John Habel, Associate Professor of Psychology,

Western Carolina University

Purpose: You are invited to participate in a research study, entitled Professors' Beliefs About Student Learning. The purpose of this study is to learn about and describe the beliefs that college professors hold about how their students learn. If you agree to participate, you will be one of approximately 10 participants in this research. Involvement with this research allows the participants the opportunity to express their beliefs and opinions about teaching and learning in higher education.

Procedure: You will be interviewed for approximately one to two hours. You will be asked about various topics regarding teaching, learning, and your experiences as a college professor. Each interview will be audiotaped and heard only by the researcher. The researcher will keep each recorded interview, as well as any documents supplied the researcher, in a locked file to prevent unauthorized use. All materials will be kept for a period of twelve months and then destroyed.

Consent: I have been given an opportunity to ask questions about this study. Answers to such questions (if any) have been satisfactory. The information in the study will be recorded and a pseudonym will be used in place of my real name in any written documents based on the information gathered during the interview. If the results of this study are published, I will not be identified by my real name, but by a pseudonym that will be used instead. In consideration of the above, I give my consent to participate in this research study. I understand that my participation is voluntary and I may withdraw at any time. I acknowledge receipt of a copy of this informed consent statement.

If you would like more information about this study, or if you have questions or concerns, please contact me, Jeffrey Hart, at (828) 627-8738. You also may contact Dr. John Habel at (828) 227-3361 or Dr. Millicent Abel, chair of the Institutional Review Board of the Department of Psychology, at (828) 227-7361.

_____ _____

Participant's Legal Signature Date

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Signature of Researcher Date