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# Professional Behaviors, Sense Of Belonging, And Professional Socialization Of Early Career Clinical Laboratory Scientists

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PROFESSIONAL BEHAVIORS, SENSE OF BELONGING, AND PROFESSIONAL  
SOCIALIZATION OF EARLY CAREER CLINICAL LABORATORY SCIENTISTS

by

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A Dissertation

Submitted to the Graduate Faculty

of the

University of North Dakota

In partial fulfillment of the requirements

For the degree of

Doctor of Philosophy

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2012

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This dissertation, submitted by Janna Marie Schill in partial fulfillment of the requirements for the Degree of Doctor of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done, and is hereby approved.

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Janna Marie Schill  
June 18, 2012

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Dedicated in memory of:  
My mom, Elaine Marie Goll

Dedicated in honor of:  
My Children, Megan, Claire, and Michael

## ABSTRACT

Professional socialization is a process that individuals experience as members of a profession and consists of the knowledge, attitudes, and experiences that influence and shape their professional identity. The process of professional socialization has not been studied in the clinical laboratory science profession. Clinical laboratory science is an allied health profession that is faced by a workforce shortage that has been caused by a decrease in new graduates, decreased retention of qualified professionals, and increased retirements. Other allied health professions such as nursing, athletic training, and pharmacy have studied professional socialization as a way to identify factors that may influence the retention of early career professionals.

This mixed method study, which quantitatively used Hall's Professionalism Scale (1968) in addition to qualitative focus group interviews, sought to identify the professional attitudes and behaviors, sense of belonging, and professional socialization of early career clinical laboratory scientists. Early career clinical laboratory scientists were divided into two groups based upon the amount of work experience they had; new clinical laboratory science graduates have had less than one year of work experience and novice clinical laboratory scientists had between one and three years of work experience.

This study found that early career clinical laboratory scientists have established professional identities and view themselves as members of the clinical laboratory science field within four proposed stages of professional socialization consisting of pre-arrival,

encounter, adaptation, and commitment. New CLS graduates and novice clinical laboratory scientists were found to be at different stages of the professional stage process. New CLS graduates, who had less than one year of work experience, were found to be in the encounter stage. Novice clinical laboratory scientists, with one to three years of work experience, were found to be in the adaptation stage. In order for early career clinical laboratory scientists to successfully transition from student to committed professional, increased support from more experienced colleagues needs to be provided for this group of laboratory professionals. This study provided an initial examination of the professional socialization process in the CLS profession and adds to existing professional socialization studies in allied health.

## CHAPTER I

### INTRODUCTION

*“We need to value the individuals entering our profession. They are full of enthusiasm and, yes, in some cases, unrealistic expectations. Most need mentoring. If we do not assist them in using their talents and realizing their goals, the profession will lose many of them” (D. Knapp, 2000).*

#### **Background of the Study**

Bragg (1976) defined professional socialization as a process through which “the individual acquires the knowledge and skills, the values and attitudes, and the habits and modes of thought of the society to which he belongs” (p. 9). Professional socialization is a complex process in which individuals experience differing levels of belonging to a profession as they begin a career, during midcareer, and at the end of a career. An individual who can identify a sense of belonging as a member of a profession is more likely to remain in the profession than an individual who does not feel that sense of belonging.

In the past 50 years there has been an increase in the fields of work that have transitioned to being considered a profession. To determine if a field is considered a profession, it must meet a set definition. A profession has been defined as:

An occupation whose core element is work based upon the mastery of a complex body of knowledge and skills. It is a vocation in which knowledge of some department of science or learning or the practice of an art founded upon it is used in the service of others. Its members are governed by codes of ethics and profess a



commitment to competence, integrity and morality, altruism, and the promotion of the public good within their domain. These commitments form the basis of a social contract between a profession and society, which in return grants the profession a monopoly over the use of its knowledge base, the right to considerable autonomy in practice and the privilege of self-regulation. Professions and their members are accountable to those served and to society. (Cruess, Johnston, & Cruess, 2004, p. 74)

Health care is a sector in the United States that has experienced a continued growth in the types of jobs that have evolved into professions. Allied health care is a group of professions that provides assistance to physicians. Allied health professions account for 60% of the total health care workforce (Garcia, 2012, p. 18) and include professions such as nursing, physical therapy, occupational therapy, radiology technology, dietetics, and clinical laboratory science (CLS).

A clinical laboratory scientist (also known as medical laboratory science or a medical technologist) is an integral member of the health care team. Clinical laboratory scientists are responsible for assuring reliable and accurate laboratory test results that contribute to the diagnosis, treatment, prognosis, and prevention of physiological and pathological conditions in humans (American Society for Clinical Laboratory Science, 2012). A clinical laboratory scientist is expected to make error-free, life-changing medical decisions on a day-to-day basis in order to deliver diagnostic information enabling the physician to diagnose, treat, and monitor disease. According to the Bureau of Labor Statistics (2012), approximately 165,000 people are employed as clinical laboratory scientists in the United States.

Clinical laboratory science has faced a workforce shortage for more than 20 years. According to the 2009 American Society for Clinical Pathology Wage and Vacancy Survey (Bennett, Thompson, Holladay, Bugbee, & Steward, 2009), the national vacancy rate for clinical laboratory science positions was 10.4% (p. 139), the highest vacancy rate of all laboratory-based allied health professions. The workforce shortage has progressively worsened over time because of three broad causes: fewer new graduates due to a reduction in accredited educational programs, poor retention of new professionals, and retirement of current professionals.

Nationally accredited clinical laboratory science programs in the United States have decreased in numbers over the last 30 years. Due to the high cost of program delivery, sponsoring institutions including both universities and hospitals have chosen to close clinical laboratory science programs, limiting the number of programs available nationwide. According to the National Accrediting Agency for Clinical Laboratory Sciences, there are currently 226 accredited clinical laboratory science programs (Cearlock & Everson, 2012) compared to 791 programs in 1970 (Bureau of Health Professions, 2005). This program decrease has reduced the number of new graduates entering the clinical laboratory science workforce on an annual basis. In 2011, approximately 2,000 new graduates entered the clinical laboratory science workforce (American Society for Clinical Pathology, 2011) compared to 7,200 in 1974 (National Accrediting Agency for Clinical Laboratory Sciences, 1974).

A second factor contributing to the workforce shortage is poor retention of certified clinical laboratory scientists. Firestone and Finnegan (1997) found that “only 43% of new graduates in clinical laboratory science saw themselves remaining in the

profession five years later” (p. 17). One area that has been explored in an attempt to identify a source of decreased retention of new graduates is educational preparedness. Beck and Doig (2007) found that the more prepared a practitioner felt as a clinical laboratory scientist, the more likely the individual was to remain in the field. Additionally, many individuals who leave the field of CLS choose to seek advanced training as a physician and those individuals viewed clinical laboratory science solely as a stepping stone to future career plans (Beck & Doig, 2007).

The final factor contributing to the workforce shortage in clinical laboratory science is the advancing age of the workforce. According to the 2009 American Society for Clinical Pathology Wage and Vacancy Survey, approximately 13% of all clinical laboratory science workers plan to retire within the next five years of employment (Bennett et al., 2009, p. 140). These massive retirements, estimated at over 21,000 clinical laboratory scientists, will only exacerbate the extreme shortages that many hospital laboratories are already experiencing.

Other allied health professions are also struggling with workforce shortage. Some professions, such as physical therapy and nuclear medical technology, are not producing enough graduates (The New York Center for Health Workforce Studies, 2006). In addition, nursing has struggled with the retention of qualified individuals in the workforce and an aging workforce population (United States Department of Health and Human Services, 2010).

Since accredited allied health programs cannot quickly increase the number of new graduates or stop individuals from choosing to retire, fields such as nursing (Deppoliti, 2008), pharmacy (Hatoum & Smith, 1987), and athletic training (Pitney,

Ilsley, & Rintala, 2002) all have examined the process of professional socialization as a way to identify if the experiences and attitudes a professional encounters while a member of a profession influence the likelihood of the individual remaining in the chosen field. In the field of nursing, it has been studied extensively using different nurse populations including the student nurse perspective (Milisen, De Busser, Kayaert, Abraham, & de Casterle, 2010), a new nurse entering practice (Deppoliti, 2008), and experienced nurses either pursuing specialty education (Faul, Parker, & Morris, 2010) or becoming upper-level administrators (Batcheller, 2011).

Professional socialization research in the field of clinical laboratory science is lacking. A need for this type of research has been expressed briefly in literature by McClure (2009), who stated, “The need to discover and understand the attitudes and perceptions towards a career in the clinical laboratory sciences...is a key element in understanding what is necessary to maintain the vitality of the CLS...profession” (p. 17). If attitudes and perceptions of early career professionals continue to not be addressed, the field will continue to struggle with retention of new graduates after entering the workforce.

Professional socialization consists of three unique concepts: the skill set, behaviors, and sense of belonging that a person identifies with during membership within a profession (Howkins & Ewens, 1999, p. 41). Entry-level clinical laboratory scientists acquire the skill set or technical knowledge and skills needed to practice clinical laboratory science during formal education provided by nationally accredited clinical laboratory science educational programs. Individuals must complete a rigorous program of study consisting of coursework in biological sciences, chemistry, liberal arts, and

upper-level clinical laboratory science courses that lead to a bachelor's degree in clinical laboratory science.

All individuals who graduate from an accredited Clinical Laboratory Science program complete a mandatory clinical internship experience. Woeste and Barham (2006) stated, "The clinical internship is the hallmark experience of the clinical laboratory science profession" (p. 592). The clinical internship experience may be an individual's sole experience in a medical laboratory prior to entering the medical laboratory workforce.

Since clinical laboratory science is a profession that relies on the competence of its individuals to complete specialized skills, the technical aspects of professional socialization have been studied to ensure accredited programs can prepare entry-level clinical laboratory scientists to perform tasks within a specialized skill set. Beck and Doig (2007) studied the new clinical laboratory scientist's perceived readiness to complete different job duties in the profession's scope of practice. Overall, new clinical laboratory scientists reported an adequate educational preparation level in the technical aspects and science-based responsibilities of the field (Beck & Doig, 2007). Early career clinical laboratory scientists are well prepared to complete the technical duties of the profession.

A related study conducted by Butina and Schell (2011) explored the professional identity of experienced members of the CLS profession. The participants in the Butina and Schell study had less than 10 years of experience. Specifically, Butina and Schell's study looked "at how medical laboratory practitioners view themselves and their profession" (p. 10). Butina and Schell limited their study to identification of the three narrative themes evident to CLS practitioners as clinical laboratory science is

misunderstood by other health care professions, is invisible to the general public, and is vital to the care of patients (p. 14). However, the researchers speculate that ignorance and misunderstanding of the role of CLS on the part of medical practitioners in other related professions may be a key contributor to new professionals leaving the occupation within a few years.

Lunz, Morris, and Castleberry (1996) sought to identify factors that correlated to high levels of career commitment in clinical laboratory science professionals in order to identify attributes for laboratory managers to use when interviewing potential employees for job vacancies. Lunz et al. found that the clinical laboratory scientists who worked in laboratories that were well staffed had higher satisfaction than those that were poorly staffed.

Neither the study conducted by Butina and Schell (2011) nor the study conducted by Lunz et al. (1996) focused on the professional socialization of clinical laboratory scientists. A lack of research exists that identifies the professional behaviors and attitudes and the sense of belonging to the CLS profession, two significant factors that may be influencing the professional socialization of early career clinical laboratory scientists.

### **Purpose of the Study**

The purpose of this study was to identify the professional behaviors and attitudes and sense of belonging expressed by early career clinical laboratory scientists. The study compared newly graduated clinical laboratory scientists, who have less than one year of work experience, with novice clinical laboratory scientists, who have one to three years of work experience. Specifically, the goal of this study was to identify what stages of

professional socialization were exhibited by early career clinical laboratory scientists and identify factors that may influence the retention of clinical laboratory professionals.

### **Rationale**

There is a lack of professional socialization research that focuses on the attitudes, behaviors, and sense of belonging of early career clinical laboratory scientists. The findings in this study are useful to clinical laboratory science educators, managers, and other allied health professionals seeking to understand factors that influence the professional socialization of early career clinical laboratory scientists and provide factors that influence the retention in health care professions.

### **Research Questions**

The following research questions were posed:

1. What professional attributes (attitudes and behaviors) and characteristics defining sense of belonging are expressed by new clinical laboratory science graduates?
2. What professional attributes (attitudes and behaviors) and characteristics defining sense of belonging are expressed by novice clinical laboratory scientists?
3. What are the differences in professional attributes (attitudes and behaviors) and characteristics defining sense of belonging expressed by new clinical laboratory science graduates compared to novice clinical laboratory scientists?
4. What experiences and feelings are expressed by early career clinical laboratory scientists in regards to educational preparation, future career goals, and intent to remain in the CLS profession?

5. What stage of professional socialization is exhibited by new clinical laboratory science graduates compared to more experienced novice clinical laboratory scientists?

### **Definitions**

*Clinical laboratory science*: the allied health profession that collects, performs, interprets medical laboratory tests (Bureau of Labor Statistics, 2012). Abbreviated CLS. Also known as medical technology or medical laboratory science.

*Clinical laboratory scientist*: a person who is a member of the clinical laboratory science profession. Also known as medical technologist or medical laboratory scientist.

*Early career clinical laboratory scientist*: a clinical laboratory scientist with less than three years of experience.

*New clinical laboratory science graduate*: a clinical laboratory scientist with less than one year of experience.

*Novice clinical laboratory scientist*: a clinical laboratory scientist with one to three years of experience.

*Professional socialization*: a process through which an “individual acquires the knowledge and skills, the values and attitudes, and habits and modes of thought...[of the profession] to which he belongs” (Bragg, 1976, p. 9).

*Professional identity*: how clinical laboratory scientists view themselves and their profession (Butina & Schell, 2011, p. 10).

*Retention*: an individual remaining in a chosen profession.

*Sense of belonging*: “the need to belong” (Baumeister & Leary, 1995, p. 520). The individual identification to the clinical laboratory science profession.



### **Study Delimitations**

1. The study was limited to graduates, who completed their degrees between 2009 to 2011, from a single, traditional, university-based clinical laboratory science program at an upper midwestern university.
2. Professionalism behaviors were measured using Hall's Professionalism Scale (1968) as adapted by Snizek (1972).
3. Hall's Professionalism Scale (1968) as adapted by Snizek (1972) was distributed using electronic distribution methods.
4. Viewpoints of professional socialization were measured using online focus groups.

## **CHAPTER II**

### **BACKGROUND**

In many health care fields, formal educational programs focus on building the required skills and knowledge necessary to complete the day-to-day job tasks. Technical competency is crucial in the life and death environment of health care. The downfall of educational programs placing an emphasis on the technical skills and knowledge aspects of a profession is that little time is left for educators to focus on the non-theoretical aspects that are necessary for new graduates to successfully transition from the classroom to a clinical environment.

Crocker and Brodie (1974) stated, “A major goal of educators in the health professions is to endow students with realistic views of their professional roles” (p. 233). If students graduate with realistic expectations, there may be an increased likelihood of an early career professional transitioning and remaining in a profession. In the nursing profession, a previous study found that individuals who form an inaccurate expectation of a chosen field experience a poor transition, which may result in a negative outcome such as “desertion from the field after graduation” (p. 233).

#### **Review of Literature**

##### **Conceptual Framework**

**Professional socialization.** Professional socialization was defined by Bragg (1976) as a “process by which an individual develops the requisite skills, knowledge,

attitudes, and beliefs necessary for successful transition to professional status” (p. 14). Professional socialization is a form of situated cognition. In situated cognition, learning “shifts the focus from the individual to the sociocultural setting and the activities of the people within that setting” (Driscoll, 2005, p. 158). A new professional is only able to truly use the information acquired in a classroom after entrance into the profession is achieved. The knowledge that is acquired in the classroom will be transformed by the social interactions and completion of the job tasks in the true work environment.

Bragg (1976) identified three distinct components that interact in the process of professional socialization: continuous, learning, and social. Professional socialization is viewed as a continuous process because, as an individual enters a profession, the professional socialization does not ever stop; rather, the individual progresses through different professional socialization stages over time. If an individual is expected to adopt certain behaviors or attitudes as a member of a profession, the acquisition of behaviors or attitudes must be acquired through formal or informal learning experiences and interactions with other professionals in a work environment. Bragg stated, “The end product of the socialization process is the incorporation of group values and norms into the individual’s self-image” (p. 14).

Nursing has extensively studied professional socialization (Kramer, 1974; Mooney, 2007; Simpson, 1979). The ability of a new nurse to transition into a practicing nurse is directly related to professional socialization. Mooney’s (2007) study of newly registered nurses found that “their [newly registered nurses] ability and willingness to become professionally socialized determines their ease of survival at clinical level” (p. 75).

Currently, in the allied health profession of clinical laboratory science (CLS), no study examines the process of professional socialization of CLS professionals, known as clinical laboratory scientists. CLS has a workforce shortage that has been attributed to a decreased number of new graduates, an aging workforce, and poor retention of qualified clinical laboratory scientists. Two of these causes of the workforce shortage, the decreased number of new graduates and the increased number of retirements, cannot be rapidly changed. However, by studying the process of professional socialization in early career clinical laboratory scientists, we may be able to help to identify ways clinical laboratories can increase retention of qualified clinical laboratory scientists.

### **Conceptual Models**

Due to a lack of literature regarding professional socialization in clinical laboratory science, other professional careers were explored to identify different professional socialization conceptual frameworks. Professions that have proposed conceptual models of professional socialization include higher education, social work, athletic training, and nursing.

**Higher education.** Rosch and Reich (1996) proposed a conceptual framework for the professional socialization of new faculty in higher education. Using mixed methods research, their study examined how new college faculty entering an initial academic appointment experienced the process of professional socialization. The Rosch and Reich model consists of the following stages: pre-arrival, encounter, adaptation, and commitment (p. 116).

Two phases of Rosch and Reich's (1996) model, pre-arrival and encounter, occur prior to an individual beginning the actual work of a college professor. In each of the two

stages, pre-employment, an individual relies heavily on acquiring theoretical information in a formal setting. The beliefs and attitudes formed prior to entering the profession are based on interactions with experienced college faculty in a student-to-expert setting. In addition, the formal interactions encountered in a classroom environment are paired with the informal interactions with faculty mentors.

Rosch and Reich's (1996) last two phases, adaptation and commitment, occur after an individual begins an initial faculty appointment. During the third stage, adaptation, an individual joins the profession of college professor and has to rely on theoretical knowledge but, as a part of adaptation, begins to adapt the information and apply it to professional practice. During the adaptation phase, a new professor will form a new identity that merges beliefs and expectations formed mainly during the pre-arrival stage with the new experiences of practice, which is influenced by the interactions with and attitudes of other faculty members. A significant finding in this stage was based on the workplace climate. Rosch and Reich found "in departments where the work environment, faculty morale, and climate were generally rated the highest...the less difficulty in adaptation to the new setting" (p. 127) was encountered.

Commitment is Rosch and Reich's (1996) final stage of professional socialization. Commitment occurs when "newcomers settle into the routine aspects of work, begin to focus on establishing their niche...[and] a cultural learning process begins" (p.127). During this phase, an individual merges past experiences encountered during both formal education and initial experiences as a new member faculty with the current workplace to form new attitudes and beliefs (p. 123). In the commitment phase, the individual is able to focus on the subculture and climate of the organization where

employed. An individual learns to navigate the subculture and climate in order to achieve individual gain.

Rosch and Reich's (1996) conceptual model of the professional socialization of new college faculty addresses the concept that an individual's professional socialization process needs to address a period of transition between formal education and practice. The transition gap occurs when the values and expectations encountered in a learning environment conflict with the true values and expectations of the actual work. The end product of the transition phase, part of Rosch and Reich's commitment phase, is a revised set of goals and values.

**Social work.** Miller (2010) studied the process of professional socialization of a social worker. The purpose of Miller's study was to create a theoretical framework that described the process by which an individual enters and remains in the field of social work. Miller identified three distinct phases of the professional socialization process of a social worker: pre-socialization, formal socialization, and practice after formal socialization (p. 930).

Miller (2010) described a social worker's pre-socialization stage as "the period of time extending up to admission in a formal social work program" (p. 931). Pre-socialization would include an individual's childhood and any education or personal experiences prior to entering into a social work program. A sub-stage of the pre-socialization stage is "anticipatory socialization" (p. 931), which is the point in time when an individual chooses to join the social work field. The experiences of the pre-socialization stage have direct correlation to completion in Miller's framework of professional socialization, and it also serves as a baseline for future individual growth.

The second stage of a social worker's professional socialization process, formal socialization (Miller, 2010), encompasses formal education in social work. Since social work education has various points of entry and exit, each individual who studies social work will have different experiences. In the United States, social work programs are accredited, which results in all social work graduates being exposed to nationally established knowledge and skill expectations. In addition to national guidelines for theoretical courses, each social work student completes at least one internship experience. Internship experiences provide the first steps of true professional socialization into the practice of social work, since experience is paired with prior knowledge and skills introduced in a classroom setting.

Miller (2010) described the influence the formal socialization stage has on the entire process of a social worker's professional socialization as "bi-directional" (p. 932). Miller stated the importance of this bi-directional relationship: "The ways in which individuals engage in their professional development has a reciprocal bearing on their relationships to their formal education" (p. 932). The more positive the experience a social worker has during the formal socialization process, the more likely the person is to positively view further professional development as a practitioner of social work.

The final stage described by Miller (2010) is the practice stage. This professional socialization stage consists of an individual practicing social work. The practice stage encompasses the entire career of a social worker. Miller describes how the practice stage relates to growth and maturation as a social worker: "The relationship to the setting in which one engages as a professional is affected by the way in which one is socialized to the profession" (p. 932). If a social worker's socialization process is realistic to the

practice setting in which the individual is employed after entering the field of social work, it may result in a more positive viewpoint of the profession and the new professional is more likely to remain in the social work profession.

Miller (2010) provided a beginning theoretical framework to describe the professional socialization process in social workers. The framework lacks supportive data that reinforce the three stages of a social worker's professional socialization, but provides a foundation for further research to explain and expand on the theoretical model. Miller emphasized the importance of formal education that includes an internship to allow for exposure to the practice of a profession prior to an individual formally entering the profession at an entry level.

**Athletic training.** In athletic training, an allied health field related to clinical laboratory science, Pitney et al. (2002) researched the professional socialization of athletic trainers who were employed as professionals in college athletics. The qualitative study broadly categorized themes into the two processes of anticipatory and organizational professional socialization (p. 63).

As a part of undergraduate degree requirements, student athletic trainers complete theoretical coursework, coupled with required clinical experiences. Participants in Pitney et al.'s (2002) study indicated recurrent themes that completion of an undergraduate degree in athletic training would not fully prepare an individual to be a successful trainer in college athletics. If an individual did not independently seek out a graduate internship, the ability to enter into practice as a college trainer was found to be unobtainable. Once employment at a college as an athletic trainer was achieved, a transitional period was still present.



Pitney et al.'s (2002) study also identified ways in which a new college athletic trainer navigated through a transition period and these experiences influenced retention in the profession. Three of 13 participants experienced "role instability," which is defined as when an individual is "unable to find adequate organizational support or commitment necessary for them to fulfill their professional mission" (p. 67). If an individual experiences role instability, the likelihood that the person will leave athletic training was found to increase.

Pitney et al.'s (2002) study of professional socialization of athletic trainers also emphasized that the ways in which an individual navigated the initial transition in a chosen field influenced the continued retention of an individual. If an individual entered into a period of time where the individual perceived there was no support from the workplace, the likelihood of professional retention decreased, resulting in the individual leaving the field, regardless of skills or ability.

**Nursing.** The area of allied health that has been most extensively studied in regards to professional socialization is the field of nursing. In an integrative review of 49 different studies of professional socialization in nursing, MacLellan, Lordly, and Gingras (2011) proposed a three stage nursing professional socialization cycle: pre-socialization, formal, and post-socialization (p. 39).

Pre-socialization of nurses is the experiences that influence an individual to enter the nursing profession. The pre-socialization phase is key to individuals choosing a profession, but also influenced the future stages of professional socialization because "values, beliefs, and expectations begin to form before students enter academia"

(MacLellan et al., 2011, p. 40). Once an individual chooses to enter the nursing profession, the professional socialization progresses to stage two, formal socialization.

During formal socialization, an individual received formal coursework on nursing concepts, participated in clinical experiences, and interacted with experienced nurses. An important influence during formal socialization was mentors. “Faculty and preceptors...have potential to make a positive impact” (MacLellan et al., 2011, p. 40) on the student nurse. Once an individual completed academic requirements and gained employment, movement progression into the third stage, post-socialization, occurs.

The post-socialization stage consisted of processes that culminated in a revision of the professional identity of an individual. The post-socialization phase has been studied extensively in an effort to improve the transformation of student to nurse. Studies have shown that the first six months of nursing employment is difficult (Almada, Carafoli, Flattery, French, & McNamara, 2004; Harwood, 2011; Newhouse, Hoffman, Suflita, & Hairston, 2007; Thrysoe, Hounsgaard, Dohn, & Wagner, 2011). Successful transformation from student to nurse is indicated by independent patient care, improvement of technical and patient care skills, and navigating workplace culture. Nurses remain in the post-socialization stage throughout their entire career.

A summary of professional socialization of nurses is described by MacLellan et al. (2011) as a process where “values, beliefs, and expectations begin to form before students enter academia, and continue to develop over the course of their professional career as they adapt to environments and colleagues possessing different priorities and expectations” (p. 40). A particular emphasis was placed on the need for mentors, such as

college faculty, clinical preceptors, and fellow nurses, at all stages of the professional socialization process.

### **Student Professional Identity**

Depending on the proposed model of professional socialization, the formation of an individual's professional identity may begin prior to (MacClellan et al., 2011; Miller, 2010) or at the point when (Rosch & Reich, 1996) an individual begins formal education in the chosen profession. Accredited clinical laboratory science programs require all students to complete a clinical internship experience as part of formal study. The clinical internship may be the sole experience a student has in a hospital laboratory prior to entry into the profession of clinical laboratory science. Several studies have been conducted that address a student's formation of a professional identity in two allied fields, nursing and pharmacy.

**Nursing.** Levett-Jones and Lathlean (2007) conducted a mixed methods research study to evaluate the formation of professional identity in student nurses. A key finding was that "a sense of belonging to the nursing team is crucial to a positive and productive learning experience" (p. 172). A student who is able to observe job responsibilities and receive the mentoring and emotional support from working professionals is more likely to form a more concrete professional identity. The entire clinical experience, including both negative and positive encounters, contributes to the student forming a positive professional identity.

Howkins and Ewens (1999) qualitatively studied the evolution of a nursing student's professional identity before, during, and after completion of a clinical experience. The transformation in professional identity was identified as a key factor to

performing well in a job interview and subsequently gaining employment after graduation.

Nursing students may spend a large amount of a clinical internship either observing or completing tasks with close supervision, which can be described as peripheral participation. Peripheral participation in an actual nursing practice environment leads to professional identity transformation (Howkins & Ewens, 1999), strengthening a new graduate's ability to relate to professional health care issues (Levett-Jones & Lathlean, 2007) and influencing the initial professional identity that is excitedly promoted by new graduates (Thrysoe et al., 2011).

Student development of a new professional identity is biased, as a student is expected to have continual supervision during an assigned clinical internship. As part of constant supervision, a student receives positive and negative feedback immediately upon completion of a task, while a new employee will complete job tasks without supervision. While constant supervision is necessary for a nursing internship in order to ensure patient safety, it does not support development of the independent decision making skills needed by the nursing professional to thrive during initial and long-term professional employment (Milisen et al., 2010).

**Pharmacy.** Pharmacy education has studied the professional socialization of students longitudinally over the time span of starting pharmacy school through the first year of professional practice. Hatoum and Smith (1987) researched the professional socialization of pharmacy students over a five year span. Study findings included that the professional socialization process of pharmacy students is incomplete and continues past the first year of professional practice (Hatoum & Smith, 1987).

Smith, Messer, and Fincham (1991) studied the change in professional behaviors and attitudes of the same cohort of pharmacy students studied by Hatoum and Smith (1987). Research findings indicated that pharmacists in their first year of practice identify a lower sense of calling towards the pharmacy profession than at the beginning of formal education (Smith et al., 1991, p. 34). In addition, the positive attitudes expressed towards pharmacy that were higher at the time of graduation were decreased one year after entering the pharmacy profession (Smith et al., 1991, p. 35). Smith et al. (1991) reported that overall the formal education process may not influence the professional socialization process of pharmacists (p. 35). This study was the only allied health study of professional socialization that did not support the argument that the professional socialization process is impacted significantly by formal education experiences.

### **Workplace Professional Identity**

The experiences encountered as part of an educational program provide the foundation of attitudes and behaviors that lead to the formation of an “ideal” professional identity (Clark, 1997). The ideal professional identity is based on the heavy emphasis formal education places on theory, which can differ from the real world application of learned theory to job tasks (Deppoliti, 2008). Once novice professionals enter the workforce, the professional socialization process continues through the enculturation into a work environment, and this, in turn, influences their professional identity.

As a novice moves further into the workplace, gaps are identified in the previously formed professional identity. The gap between the “ideal” and the “reality” of a profession has been defined as a theory-practice gap (Maben, Latter, & Clark, 2006). The period of time that an individual is navigating the theory-practice gap has been

termed in the literature by others as “transition shock” (Harwood, 2011), “reality shock” (Kramer, 1974), or an “abrupt awakening” (Thrysoe et al., 2011).

**Nursing.** Since nursing is the allied health profession that has most extensively studied professional socialization, nursing researchers have also explored the theory-practice gap. Deppoliti (2008) described the significance of the theory-practice gap: “Disparity between the idealism and professionalism of the educational process and the actualization of the practice environment...leads to nurses leaving the profession” (p. 255). That qualitative research study interviewed new nurses in order to evaluate the individual transition from student to care provider. A significant factor that contributed to a successful transition from student to nurse was an “appropriate balance of challenge and support from the system, peers, colleagues and patients” (p. 261), which resulted in a transformed professional image during the first three years of nursing.

Price (2008), in a qualitative meta-synthesis of 10 previous studies, sought to identify the experiences that influenced the professional socialization of nurses with less than one year of experience. The meta-synthesis reiterated the difficulty of navigating through the “reality shock” (p. 14). Reality shock resulted when a new nurse needed to create a new self-identified professional identity that contradicted prior aspects of nursing imparted by isolated educational experiences. Price’s research found that workplace colleagues are important to novices transitioning from student to nurse. “Nursing professional socialization is greatly influenced by the role models, especially other nurses in practice settings and mentors within the profession” (p. 18).

Mooney (2007) used a grounded theory approach to study novice registered nurses with less than one year of work experience. A theme categorized as frustration

was expressed by study participants who focused on a quality of patient care and the discrepancy between what they were taught in their coursework and workplace practice. Novice nurses recognized that a gap existed between education and practice. Mooney's study found that coworkers played a role in the professional socialization of new nurses and stated the importance of coworkers as "nurses' professional socialization is greatly influenced by the role models, especially other nurses in practice settings and mentors within the profession" (p. 18). When a novice nurse interacts with an experienced nurse who practices a high quality of care, the novice nurse is able to transition through the theory-practice gap more easily, as the disconnect between education and practice is less.

The clinical laboratory science research has not focused on the individual professional identities of clinical laboratory scientists. Previous CLS studies focus on the identification of reasons why causes of decreased retention are present in the profession from the perspective of the laboratory manager and formal preparation prior to entering the workforce.

### **Clinical Laboratory Science**

Unlike these other allied health professions, the field of clinical laboratory science has done very little research within the framework of professional socialization. Some aspects of professional socialization, such as the professional identity, educational preparation of new graduates, retention including career commitment and job dissatisfaction, have been studied by researchers. A search of the literature, however, reveals that research was limited in depth, as the research primarily focused on clinical laboratory scientists with more than five years of work experience. The following section summarizes these studies.

**Retention.** Beck and Doig (2005) researched reasons why clinical laboratory science has decreased retention. The study did not focus on the individuals who were leaving a job or the profession but gathered information from laboratory managers who are faced with being short staffed when an employee leaves the laboratory.

Beck and Doig (2005) found that decreased retention occurred most significantly when an individual is employed at a facility for less than five years. Beck and Doig (2005) concluded, “Leaving early is not surprising because in the first few years of practice, employees may be learning whether or not the clinical laboratory environment is a good match for them” (p. 244). Beck and Doig (2005) pointed out that those first few years of initial employment are vital for an individual choosing to remain in the CLS profession. They concluded that an important way to reduce the severity of the CLS workforce shortage is to ensure that experienced clinical laboratory scientists actively assist new professionals in their transitioning from student to practitioner.

**Career commitment in clinical laboratory science.** Blau (1999) conducted a five year longitudinal study that examined the professional commitment of clinical laboratory scientists with less than five years of work experience. Over time, new clinical laboratory scientists expressed a decreased level of professional commitment (Blau, 1999). One possible cause of the decreased professional commitment was due to implementation of federal mandates that resulted in a decrease in qualified individuals who could work as a clinical laboratory scientist. While the study participants were qualified to meet the federal mandates, the elimination of staff created a stressful work environment that may have contributed to a decreased work commitment (Blau, 1999).



Blau and Lunz (1998) conducted a longitudinal study that researched the correlation between level of professional commitment and intent to leave the clinical laboratory profession. The major finding of this national study was “younger and less satisfied medical technologists [former name of clinical laboratory scientist] had a higher intent to leave the profession” (p. 260). Though the Blau and Lunz study identified that young professionals have an increased likelihood to leave the profession, the findings did not identify reasons why early career clinical laboratory scientists were choosing to leave the field during the 1990s.

Firestone and Finnegan (1997) conducted a national survey of recent clinical laboratory science graduates and found discouraging results regarding self-reported intention to remain in the profession. A major finding of this national study was “only 43% of respondents planned to remain in the field for a period of longer than five years” (p. 17).

**Job dissatisfaction.** McClure (2008) examined the perspectives of clinical laboratory scientists with varying amounts of work experience. The amount of work experience ranged from early to end of career. A major finding in this study was the differences in attitudes towards the profession in the laboratory professionals with less than 2 years of experience to those with 4 to 10 years of experience. The professionals with 4 to 10 years of experience expressed increased dissatisfaction with the CLS profession and described the field as a “dead-end” (McClure, 2008, p. E5). The recommended solutions suggested by McClure (2008), such as increasing pay, were only short-term solutions.

Doig and Beck (2005) quantitatively studied causes of job dissatisfaction using a national survey that sought to identify CLS professionals' attitudes and behaviors in regards to CLS as a profession. The study was one of the only published studies that shared results that explored the workplace culture in the clinical laboratory. They found that autonomy and independence were two key factors found to correlate with increased job satisfaction (Doig & Beck, 2005, p. 26).

Professional dissatisfaction is not a new concern in the clinical laboratory science profession; rather, it is a chronic disease that has not been properly addressed over time. Hajek and Blumberg (1982) surveyed recent graduates in the state of Illinois. In general, the similar sources of career dissatisfaction identified by Doig and Beck (2005), such as lack of respect from general public and other health care providers, were listed as causes of increased professional dissatisfaction. The disconnects between classroom and job expectations were cited as creating an "identity crisis" (Hajek & Blumberg, 1982, p. 496) in the CLS profession.

**Knowledge and skills of new graduates.** Beck and Doig (2002) conducted a national survey of educators, practicing CLS staff, and laboratory managers to determine if new graduates in CLS have the appropriate technical skills and knowledge to be successful clinical laboratory scientists. The study concluded that new graduates have the necessary technical knowledge but may not be as prepared to navigate the non-technical job tasks that are often assigned within the first three years after entering the profession.

In order to identify presence of a theory-practice gap in CLS, Beck and Doig (2007) conducted a national survey of board certified, early career professionals with less than three years of experience. The study sought "to assess the relationship between the

educational preparation and the career expectations” (Beck & Doig, 2007, p. 238) of clinical laboratory scientists. They found that the more closely an early career clinical laboratory scientist’s current position matched pre-conceived expectations, the longer the individual intended to remain within the profession.

**CLS professional identity.** Butina and Schell (2011) qualitatively studied the perceived identity of the clinical laboratory science profession from a population of experienced clinical laboratory scientists. Study participants reported that CLS has a poor professional identity and the three emergent viewpoints of the CLS profession are “misunderstanding of the profession by other health care professions, general unawareness by the public, [but] vital to patient care” (p. 14). Butina and Schell concluded that the negative professional identity may influence the retention of clinical laboratory scientists in the United States.

### **Summary**

Professional socialization is the process that an individual experiences that allows the formation of a professional identity. The professional socialization process has been studied extensively by professions including nursing, athletic training, social work, and higher education. The profession of clinical laboratory science has not studied the professional socialization process. Previous CLS research has identified that poor retention of clinical laboratory scientists is a factor that has contributed to the current workforce shortage of qualified laboratory personnel. By studying the professional socialization process, the CLS profession may identify factors that may increase the retention of experienced laboratory professionals.

## **CHAPTER III**

### **RESEARCH METHODOLOGIES**

#### **Introduction**

In this chapter, the methods and procedures for this study of professional socialization in early career clinical laboratory scientists in the United States are described. Included in this chapter are identification of study participants and methods of data collection and analyses.

#### **Purpose**

Currently, there is a lack of research addressing professional socialization of early career clinical laboratory scientists in the United States. The study was guided by the following research questions:

1. What professional attributes (attitudes and behaviors) and characteristics defining sense of belonging are expressed by new clinical laboratory science graduates?
2. What professional attributes (attitudes and behaviors) and characteristics defining sense of belonging are expressed by novice clinical laboratory scientists?
3. What are the differences in professional attributes (attitudes and behaviors) and characteristics defining sense of belonging expressed by new clinical laboratory science graduates compared to novice clinical laboratory scientists?

4. What experiences and feelings are expressed by early career clinical laboratory scientists in regards to educational preparation, future career goals, and intent to remain in the CLS profession?
5. What stage of professional socialization is exhibited by new clinical laboratory science graduates compared to more experienced novice clinical laboratory scientists?

### **Research Design**

Currently, a lack of research exists in the area of professional socialization in the field of clinical laboratory science. Since the study explored two aspects of professional socialization, behaviors and attitudes and also personal experiences, a single style of research collection, solely qualitative or quantitative, would not allow for both concepts to be studied in an in-depth manner. In order for the study to adequately address both behaviors and experiences, it was necessary to collect information using both qualitative and quantitative research methods, a style of research known as mixed methods research.

Burke Johnson and Onwuegbuzie (2004) defined mixed methods research as “the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or languages into a single study” (p. 17). A mixed method research design was specifically selected in order to enrich data collected quantitatively with a survey with qualitative focus group interviews.

In this study, the Hall’s Professionalism Scale (1968) survey, which was adapted by Snizek (1972) (see Appendix A), was used as a quantitative measure of professional attitudes and behaviors of early career clinical laboratory scientists. At the same time of survey collection, online focus group interviews (see Appendix B) were concurrently

conducted to gather qualitative data in order to assess each individual's sense of belonging to the clinical laboratory science profession.

This concurrent gathering of both quantitative and qualitative data classifies the method of research used as a “concurrent mixed methods” approach. According to Creswell and Plano Clark (2011), a concurrent mixed methods design is used “when the researcher wants to triangulate the methods by directly comparing and contrasting quantitative statistical results with qualitative finds for corroboration and validation purposes” (p. 77). The purpose of this concurrent mixed methods design is to “simultaneously collect both quantitative and qualitative data, merge the data, and use the results to understand a research problem” (Creswell, 2008, p. 557). In this way, the quantitative data collected from the survey will be triangulated by the qualitative focus group findings, thus strengthening the results for the posed research questions.

### **Study Participants**

Early career clinical laboratory scientists were identified as those individuals with less than three years of work experience. Individuals with more than three years of experience as a clinical laboratory scientist are eligible to pursue specialty certification in different laboratory topics. The ability of a clinical laboratory scientist to pursue specialty certification is an indicator of advanced experience in the CLS profession (American Society for Clinical Pathology, 2012).

Participants from this study were drawn from a single clinical laboratory science program located at an upper midwestern university. The university is a comprehensive university with an annual enrollment of approximately 14,000 students. The university Clinical Laboratory Science (CLS) program is the only in-state, university-based CLS

program and one of the five largest nationally accredited clinical laboratory science programs nationwide. Approximately 85 students complete the program each year.

This study utilized a convenience sample. Participants were recruited using lists of alumni who completed the undergraduate CLS program between May 2009 and May 2011. At the time of data collection, all participants had less than three years of full-time work experience. Eligible participants completed the CLS program using a traditional route of study with a clinical internship of greater than 12 weeks in length. For the purposes of this study, 141 individuals were identified as possible participants; 112 were able to be contacted using electronic means.

Participants were divided into two different groups based on time since program completion. Members of Group One were considered “new clinical laboratory science graduates.” These 69 individuals completed the CLS program in May 2011. At the time of data collection, Group One had less than one year of work experience in clinical laboratory science. They were electronically sent Hall’s Professionalism Scale (1968) survey (see Appendix A) in May 2011 and were asked to submit their surveys by the end of July 2011. A total of 24 surveys were returned. The response rate was 34.8%.

At the time of survey distribution, Group One participants were also asked to participate in an anonymous online focus group (see Appendix C). Focus group interviews were conducted in May 2011 and June 2011 (see Appendix D). Eight individuals volunteered to participate in focus group interviews. The response rate was 33.3%.

The second group of participants, Group Two, consisted of 72 individuals who completed the clinical laboratory science program between May 2009 and May 2010. All

Group Two participants were considered “novice clinical laboratory scientists.” At the time of data collection, Group Two had one to three years of work experience. Only 43 of the 72 were able to be contacted electronically. The Hall’s Professionalism Scale (1968) was electronically distributed to the 43 individuals in Group Two in February 2012; data collection ended in March 2012. Twenty-one surveys were returned with a 48.8% response rate.

At the time of survey distribution, Group Two participants were also asked to participate in the anonymous online focus group. Group Two focus group interviews were conducted in March 2012. Three individuals participated in focus group interviews. The response rate was 14.3%.

### **Quantitative Instrument**

Hall’s Professionalism Scale (1968) as adapted by Snizek (1972) identifies individual professional behaviors. A high expression of professional behaviors correlates with a positive viewpoint of an individual profession. The Hall’s Professionalism Scale (1968) has been used extensively in other professions including nursing, accounting, engineering, occupational therapy, education, and medicine (Blezek, 1987; Breeden et al., 2000; Hall, 1968; Shafer, Park, & Lia, 2000; Snizek, 1972).

Hall’s Professionalism Scale (1968) focuses on five different constructs: professional organizations, service to society, self-regulation, calling to the field, and autonomy (p. 93). The intent of each of the five constructs is defined in detail as follows:

1. Professional organizations: The professional organization construct consists of statements that indicate the utilization of a professional organization as a resource. The entity of a professional organization includes both the formal



structure of the organization and the informal network of people who are members.

2. Service to society: The service to society construct consists of statements that indicate expressions of belief that the profession is significant to others, including both the people who practice the profession and the public.
3. Self-regulation: The self-regulation construct consists of statements that indicate that the people who practice a chosen profession judge the work of fellow colleagues and judge the performance of job duties.
4. Calling to the field: The calling to the field construct consists of statements that indicate members of the profession are dedicated individuals who would remain dedicated even if the rewards, such as pay, would be lower than they are at present.
5. Autonomy: The autonomy construct consists of statements that indicate members of the profession are able to make decisions independently, without influence from place of employment, other coworkers, or the person who is receiving the services provided by the profession.

Hall's Professionalism Scale was introduced in the literature in 1968 as a 50-item questionnaire consisting of 10 different questions in each of the five different constructs (Hall, 1968). Snizek (1972) shortened the survey to 25 items consisting of 5 different questions in each of the five constructs.

### **Instrument Reliability**

Hall (1968) originally verified the reliability of Hall's Professionalism Scale in many different professions including medical physician, nurse, social worker, librarian,

and lawyer. Snizek (1972), after shortening the original Hall's Professionalism Scale, reported higher Cronbach's alpha for each construct compared to Hall's original analysis.

For the purposes of this study, the electronic version of Hall's Professionalism Scale (1968) as revised by Snizek (1972) contained a revised six-point Likert-like response scale. The original Hall's Professionalism Scale (1968) survey consisted of a five-point Likert-like scale that contained a neutral response choice. In the new scale, participants were asked to rate their responses in terms of Strongly Disagree, Disagree, Slightly Disagree, Slightly Agree, Agree, and Strongly Agree, thus eliminating Hall's neutral response choice. The neutral response was removed in order to equalize the distance between each scale category (Dunn-Rankin, Knezek, Wallace, & Zhang, 2004).

Prior to data analysis, the modified Hall's Professionalism Scale (1968) as revised by Snizek (1972) was reassessed for construct reliability to account for the changes made to the scale, as well as the minor revisions to the question wording that were made to clarify that the profession the respondent was considering was clinical laboratory science. A Cronbach's alpha calculation was used to ensure construct reliability. According to Dunn-Rankin et al. (2004), "Cronbach's alpha is most commonly used to determine reliability of a set of categorical ratings" (p. 11).

Hall's Professionalism Scale (1968) as adapted by Snizek (1972) demonstrated a higher Cronbach's alpha using a five-point scale compared to the newly adapted six-point scale. Although the new survey's Cronbach's alpha was lower than reported by Snizek (1972), a Cronbach's alpha greater than 0.400 is considered to be acceptable (Leech, Barrett, & Morgan, 2005, p. 67). As all constructs scored above that mark, the revised survey is considered to be a reliable instrument. Table 1 contains the Snizek's (1972)

Hall's Professionalism Scale (1968) and the current study's scale and question reliability scores after these modifications were made.

Table 1. Reliability of Hall's Professionalism Scale (1968) as Adapted by Snizek (1972) After Revision to a Six-point Likert-like Scale.

Construct	Six-point Modified Scale	Snizek's Revised Scale
Viewpoint of Professional Organizations	.547	.621
Providing Service to the Public	.566	.640
Self-regulation	.622	.699
Calling to the Field	.622	.583
Autonomy	.712	.738

### Qualitative Instrument

The qualitative instrument used for this study is the researcher (Patton, 2002, p. 566). In order to eliminate researcher bias, the researcher objectively interacted and collected data (Bogdan & Biklen, 2007). The researcher in this study is an educator in the clinical laboratory science profession. The researcher is a board certified clinical laboratory scientist. The researcher in this study is a graduate of an accredited clinical laboratory science program.

In addition, the researcher has interacted with all focus group participants in previous learning experiences. In an attempt to eliminate bias towards any focus group participants, all focus group volunteers were asked to use an anonymous login name in the electronic chat session. The anonymous name prevented the researcher from having

any possibility of past experiences influencing data collection and analysis. Even though this study was the first qualitative study completed outside of basic qualitative research coursework, the researcher attempted to remain unbiased, trustworthy, and authentic (Lincoln & Guba, 1985) at all times.

### **Data Collection**

Approval from the Institutional Review Board at the upper midwestern university was received prior to data collection (see Appendix E). In order to maintain individual anonymity, quantitative survey responses were returned to a third-party faculty member within the clinical laboratory science program at the university. The third-party individual was not directly involved in this study but acted as the liaison between the researcher and the participants to distribute surveys and establish meeting times for online focus groups. The individual identities of all focus group participants were kept anonymous in order to allow participants to feel comfortable expressing opinions about both prior educational preparation and current experiences as practitioners in the field.

All participants were asked to complete the revised Hall's Professionalism Scale as adapted by Snizek (1972). Participants were sent a request to complete the survey in an electronic format. After two weeks had passed, a second request to participate was sent. After an additional week, a final request to complete was electronically distributed. Each individual was given a week to respond to the final request. All surveys were returned electronically to a third party in the clinical laboratory science program in order to keep all responses anonymous.

At the time of survey distribution, participants were asked to take part in an online focus group interview. Those choosing to volunteer for the online survey were asked to

send an electronic response accepting the invitation to participate in the focus group interview to the third party who was collecting the revised survey, thus maintaining subject anonymity.

Online focus group interviews were conducted using an electronic chat format using Adobe Connect. An online focus group format was chosen to allow participation regardless of current geographic location or assigned work schedule of each focus group volunteer. Each online focus group interview length was approximately one hour. A private URL address to the online focus group location was assigned and distributed to each volunteer. Participants were asked to login using an anonymous name in order to preserve anonymity.

Prior to beginning the focus group interview, each participant was informed that the chat was voluntary and that the participant could choose to not answer any questions or leave the interview at any time. Since each interview question and each response was communicated to the appropriate focus group member, interviewer or interviewee, using a text-based interaction, each transcript was transcribed automatically as part of each focus group interview. In order to ensure saturation of information, a minimum of two focus groups interviews were conducted for each group of participants, as recommended by Vaughn, Schumm, and Sinagub (1996, p. 48).

### **Data Analysis**

After collection of data, initial data analysis occurred independently on each of the quantitative and qualitative data sets. Upon completion of each independent data analysis, further analysis consisted of side by side comparison of quantitative survey

results with the qualitative focus group interview results. Collaborative data analysis utilized the mixed method data analysis technique of triangulation.

### **Quantitative Data Analysis**

Data collected from the revised Hall's Professionalism Scale (1968) as adapted by Snizek (1972) were analyzed using traditional quantitative analysis. Data analysis was conducted utilizing IBM SPSS 19©. Descriptive data analysis included frequency and percentages of each response for each item in the 25-item survey. In addition, characteristics of the respondent were analyzed by inferential statistics.

The demographic variables collected in addition to the revised Hall's Professionalism Scale (1968) survey consisted of gender, time since program completion, route of study, age, professional organization membership, and future routes of advanced academic study. In addition, an independent t-test analysis was conducted on individual questionnaire items as well as the five different survey constructs using the five different demographic variables for groupings.

### **Qualitative Data Analysis**

Qualitative data were collected using an online chat-based interface (see Appendix D). The online chat-based interface allowed each individual focus group response to be transcribed in a real-time format. The real-time transcription was used to ensure descriptive validity (Maxwell, 1992). In addition, online chat sessions were used for all focus group interviews, which ensured consistency of data collection between all data collection sessions (Miles & Huberman, 1994). A total of five different focus group sessions occurred: three focus groups for new CLS graduates and two for novice clinical

laboratory scientists. All participants were given the choice to not respond to any question and to stop participating in the focus group interview at any time.

After completion of all focus group interviews, the data were qualitatively analyzed. Focus group interviews of new clinical laboratory science graduates and novice clinical laboratory scientists were individually analyzed and coded. Coding consisted of reviewing data for “regularities and patterns” (Bogdan & Biklen, 2007, p. 173). After coding of each interview, themes and categories were identified and defined.

### **Mixed Method Data Analysis**

In order to connect the qualitative and quantitative data together to explain the professional socialization process of early career clinical laboratory scientists, additional mixed method data analysis utilized the triangulation technique. Mixed method triangulation is not to be confused with qualitative data triangulation. Creswell (2008) defines mixed method data triangulation as “simultaneously collecting both quantitative and qualitative data, merging the data, and using the results to best understand a research problem” (p. 648). Table 2 contains the structure of mixed method data analysis that combined quantitative and qualitative data after each data set was independently analyzed.

After separate qualitative and quantitative data analysis, the quantitative and qualitative findings were merged with the intent to strengthen the findings. Erzberger and Kelle (2003) describe the role of triangulation as part of data analysis: “The varying perspectives opened up by different methods may supplement each other so as to produce a fuller picture” (p. 470).

Table 2. Mixed Method Research Analysis Process for Research Study on the Behavior and Attitudes, Sense of Belonging, and Professional Socialization of Early Career Clinical Laboratory Scientist.

Research Topic	Process of Professional Socialization in Early Career Clinical Laboratory Science	Sense of Belonging to CLS Profession	Attitudes & Behaviors
Data Collection	Merging of Quantitative Survey With Qualitative Focus Group Data	Focus Group Interviews Transcripts of Interviews	Quantitative Data Hall's Professionalism Scale
Data Analysis	Mixed Method Triangulation	Coding, Category, and Theme Identification	Descriptive and Inferential Statistics



## **CHAPTER IV**

### **RESULTS**

The purpose of this mixed method research study was to identify the professional attributes, sense of belonging, and stage of professional socialization expressed by early career clinical laboratory scientists with less than three years of work experience. The following research questions guided this study:

1. What professional attributes (attitudes and behaviors) and characteristics defining sense of belonging are expressed by new clinical laboratory science graduates?
2. What professional attributes (attitudes and behaviors) and characteristics defining sense of belonging are expressed by novice clinical laboratory scientists?
3. What are the differences in professional attributes (attitudes and behaviors) and characteristics defining sense of belonging expressed by new clinical laboratory science graduates compared to novice clinical laboratory scientists?
4. What experiences and feelings are expressed by early career clinical laboratory scientists in regards to educational preparation, future career goals, and intent to remain in the CLS profession?
5. What stage of professional socialization is exhibited by new clinical laboratory science graduates compared to more experienced novice clinical laboratory scientists?

This chapter includes the demographic characteristics along with subsequent mixed method analysis to the stated research questions. The mixed method analysis consisted of individual analysis of the qualitative and quantitative results, followed by a subsequent combined analysis of qualitative and quantitative findings.

### **Research Questions**

#### **Research Question 1: What Professional Attributes (Attitudes and Behaviors) and Characteristics Defining Sense of Belonging Are Expressed by New Clinical Laboratory Science Graduates?**

**Demographic characteristics.** Each participant, who completed the revised Hall’s Professionalism Scale (1968) as adapted by Snizek (1972), was asked to indicate several demographic items. Respondents were asked to identify gender, age, membership in professional organizations, years of experience, and future educational plans. Table 3 provides the demographic data for new clinical laboratory science graduates.

Table 3. Demographic Characteristics for Respondents With Less Than One Year of Work Experience.

Characteristics	n	
Gender	Male	10
	Female	14
Age	< 25 years old	14
	≥ 25 years old	10
Professional Organizations	None	9
	One or more professional organization	15
Future Educational Plans	Yes	9
	No	15

The frequency and distribution of demographic characteristics for new graduate clinical laboratory scientists for gender, age, professional organization membership, and future educational plans had a fairly balanced distribution. A slightly higher percentage of females compared to males participated in the study, 58.3% compared to 41.7%, respectively. Most participants, 58.3%, were less than 25 years old. A majority of new CLS graduates, 62.5%, were a member of a professional organization and 62.5% did not indicate future plans to pursue further education.

**Professional attributes.** The revised Hall's Professionalism Scale was used to collect quantitative data on the attitudes and behaviors expressed by clinical laboratory scientists with less than one year of experience. The scale's questions are categorized into five general constructs: professional organizations, duty to the public, self-regulation, calling to the field, and autonomy.

**Professional organizations.** Survey respondents indicated a strong agreement on survey items focused on the role of the professional organization. In Table 4, the number and percentages of responses are provided for each of the professional organization questions. Support for the professional organization was unanimous, as all participants agreed that professional organizations should be supported. The majority of these new CLS graduates have become involved with a professional organization, as 66.7% (n=16) indicated agreement to attendance at a local professional organization meeting.

One element of the professional organizations construct, the professional journal, was not incorporated into the behaviors of these new CLS graduates. Only 45.8% (n=11) indicated agreement that reading a professional journal was a current behavior. However, 70.9% (n=17) indicated that reading professional journals is an activity that they would

Table 4. Descriptive Statistics Including Mean, Frequency, and Distribution for Clinical Laboratory Scientists With Less Than One Year of Experience in Hall's Professionalism Scale (1968) Professional Organization Construct.

Question	Mean	STD		D		SLD		SLA		A		STA	
		n	%	n	%	n	%	n	%	n	%	n	%
I systematically read the professional journals.	3.08	3	12.5	7	29.2	3	12.5	8	33.3	2	8.3	1	4.2
I attend professional meetings at the local level.	3.79	2	8.3	1	4.2	5	20.8	9	37.5	6	25.0	1	4.2
I believe that professional organizations should be supported.	5.13	0	0	0	0	0	0	2	8.3	17	70.9	5	20.8
The professional organization doesn't really do too much for the average member.	3.13	0	0	9	37.5	7	29.2	5	20.8	2	8.3	1	4.2
Although I would like to, I really don't read professional journals too often.	4.00	1	4.2	1	4.2	4	16.7	9	37.5	7	29.2	1	4.2

Abbreviations: STD: Strongly Disagree; D: Disagree; SLD: Slightly Disagree; SLA: Slightly Agree; A: Agree; STA: Strongly Agree.

like to do more often. This indicates that although they understand the value and importance of reading the journals, the majority of them are not yet doing so.

*Demographic group differences.* An independent t-test sample was used to determine if gender, age, professional organization membership, or future educational plans resulted in differences in the score for questions in the professional organizations construct. Age, professional organization membership, and future educational plans did not have significant differences.

The professional organizations construct score did result in a significant difference with regard to gender, however. The t-test means of males and females was  $t(22)=2.105$ ,  $p < 0.05$ . The mean of females was significantly lower ( $m = 3.18$ ,  $sd = 1.02$ )

than the mean of males ( $m = 3.90$ ,  $sd = 3.90$ ). This indicates that females may be less likely to become involved with aspects in the professional organization including attending local meetings and reading professional journals regularly.

***Duty to the public.*** Five survey items were grouped within the construct categorized as duty to the public. Duty to the public consisted of statements that focused on two individual concepts: the necessity of the clinical laboratory science profession and the perceived presence of the profession of clinical laboratory science. In Table 5, the number and percentages of responses are provided for each duty to the public question. New CLS graduates indicate that the profession of CLS has a duty to the public, with 91.7% ( $n=22$ ) indicating that the CLS profession is vital and 62.5% ( $n=15$ ) agreeing that the CLS profession is essential and indispensable.

***Demographic group differences.*** An independent t-test sample was used to determine if gender, age, professional organization membership, or future educational plans resulted in differences in the total score for duty to the public construct. Gender, age, professional organization membership, and future educational plans did not have significant differences.

***Self-regulation.*** In the self-regulation construct, five survey questions addressed the ability of the CLS profession to evaluate the competency and quality of its members. New CLS graduates indicated that the CLS profession is well regulated by the members of the profession, as 95.8% ( $n=23$ ) indicated agreement that other colleagues are aware of each other's competence. The new graduates also believe that the CLS profession offers opportunities to judge each other's work, as 100.0% ( $n=24$ ) indicated agreement to this question.

Table 5. Descriptive Statistics Including Mean, Frequency, and Distribution for Clinical Laboratory Scientists With Less Than One Year of Experience in Hall’s Professionalism Scale (1968) Duty to the Public Construct.

Question	Mean	STD		D		SLD		SLA		A		STA	
		n	%	n	%	n	%	n	%	n	%	n	%
Other professions are actually more vital to society than mine.	2.21	5	20.8	11	45.8	6	25.0	2	8.3	0	0	0	0
I think that my profession, more than any other, is essential for society.	3.75	0	0	4	16.7	5	20.8	10	41.7	3	12.5	2	8.3
The importance of my profession is sometimes overstressed.	2.58	4	16.7	7	29.2	10	41.7	1	4.2	2	8.3	0	0
Some other occupations are actually more important to society than is mine.	3.75	0	0	4	16.7	8	33.3	5	20.8	4	16.7	3	12.5
If ever an occupation is indispensable, it is this one.	3.67	4	16.7	3	12.5	2	8.3	6	25.0	6	25.0	3	12.5

*Abbreviations: STD: Strongly Disagree; D: Disagree; SLD: Slightly Disagree; SLA: Slightly Agree; A: Agree; STA: Strongly Agree.*

New CLS graduates indicated that the profession is able to assess the work quality of its members. In this study, 95.7% (n=23) of new CLS graduates indicated agreement that members of the CLS profession know how well other members of the profession are performing their work. In Table 6, the numbers, percentages, and means of responses are provided for each self-regulation survey question.

*Demographic group differences.* An independent t-test sample was used to determine if gender, age, professional organization membership, or future educational plans resulted in differences in the self-regulation construct score. Gender, age,

Table 6. Descriptive Statistics Including Mean, Frequency, and Distribution for Clinical Laboratory Scientists With Less Than One Year of Experience in Hall’s Professionalism Scale (1968) Self-regulation Construct.

Question	Mean	STD		D		SLD		SLA		A		STA	
		n	%	n	%	n	%	n	%	n	%	n	%
My fellow professionals have a pretty good idea about each other’s competence.	4.75	0	0	0	0	1	4.2	7	29.2	13	54.2	3	12.5
A problem in this profession is that no one really knows what his colleagues are doing.	2.54	2	8.3	14	58.3	4	16.7	1	4.2	3	12.5	0	0
We really have no way of judging each other’s competence.	2.21	4	16.7	12	50.0	7	29.2	1	4.2	0	0	0	0
There is not much opportunity to judge how another person does his work.	2.75	8	33.3	14	58.3	2	8.3	0	0	0	0	0	0
My colleagues pretty well know how well we all do in our work.	4.57	0	0	0	0	1	4.3	10	43.5	10	43.5	2	8.7

Abbreviations: STD: Strongly Disagree; D: Disagree; SLD: Slightly Disagree; SLA: Slightly Agree; A: Agree; STA: Strongly Agree.

professional organization membership, and future educational plans did not have significant differences.

**Calling to the field.** The fourth construct in Hall’s Professionalism Scale (1968) is calling to the field. The calling to the field construct consists of five questions whose statements focus on the perceived dedication to the CLS profession by its members. Overall, the perception of these new graduates regarding CLS professionals’ calling to the field is high across most questions. The majority of new CLS graduates, 87.5% (n=21), indicated that members of the profession do have a “calling” to CLS. In addition,

95.6% (n=23) of new CLS graduates indicated that the people who work in the CLS profession are dedicated. New CLS graduates, 79.2% (n=19), are encouraged by the ideals maintained by members of the CLS profession. And, to a slightly lesser degree, 70.9% (n=17) of these new CLS graduates indicate that the members of the CLS profession believe in their work.

The survey item in the calling to the field construct that had the lowest mean response of 3.02 was related to pay of CLS professionals. Only 41.6% (n=10) of new CLS graduates indicated agreement to the statement that asked if clinical laboratory scientists would remain in the profession even if pay was reduced. In Table 7, the numbers, percentages, and means for each of the five survey items in the calling to the field construct are provided.

*Demographic group differences.* An independent t-test sample was used to determine if gender, age, professional organization membership, or future educational plans resulted in differences in the sense of calling construct score. Gender, age, professional organization membership, and future educational plans demographics mean differences did not have significant differences.

*Autonomy.* The final construct in Hall's Professionalism Scale (1968) is autonomy. The construct of autonomy consists of five survey items that focus on the ability of an individual to freely perform job responsibilities. New clinical laboratory science graduates do not indicate autonomous CLS practice, as 95.8% (n=23) indicated that their decisions are subject to review. In addition, 88.2% (n=18) indicated disagreement to the statement, "I am my own boss in almost every work-related situation."



Table 7. Descriptive Statistics Including Mean, Frequency, and Distribution for Clinical Laboratory Scientists With Less Than One Year of Experience in Hall’s Professionalism Scale (1968) Calling to the Field Construct.

Question	Mean	SD		D		SLD		SLA		A		STA	
		n	%	n	%	n	%	n	%	n	%	n	%
People in this profession have a real “calling” for their work.	4.39	0	0	0	0	2	8.7	11	45.8	9	37.5	1	4.2
The dedication of people in this field is most gratifying.	4.48	0	0	0	0	1	4.3	11	47.8	10	43.5	1	4.3
It is encouraging to see the high level of idealism which is maintained by people in this field.	3.92	2	8.7	1	4.3	1	4.3	10	41.7	7	29.2	2	8.3
Most people would stay in the profession even if their incomes were reduced.	3.08	1	4.2	7	29.2	6	25.0	9	37.5	1	4.2	0	0
There are very few people who don’t really believe in their work.	3.88	1	4.2	3	12.5	3	12.5	9	37.5	7	29.2	1	4.2

*Abbreviations: STD: Strongly Disagree; D: Disagree; SLD: Slightly Disagree; SLA: Slightly Agree; A: Agree; STA: Strongly Agree.*

An area of autonomy that is demonstrated by new CLS graduates, however, is in the area of professional judgment, as 75.0% (n=18) indicated disagreement to the statement, “I don’t have much opportunity to exercise my own judgment.” Supporting this, 75.0% (n=15) of new CLS graduates indicated that they are allowed to make decisions on work tasks. In Table 8, the numbers, percentages, and means for each of the five survey items in the autonomy construct are provided.

Table 8. Descriptive Statistics Including Mean, Frequency, and Distribution for Clinical Laboratory Scientists With Less Than One Year of Experience in Hall’s Professionalism Scale (1968) Autonomy Construct.

Question	Mean	STD		D		SLD		SLA		A		STA	
		n	%	n	%	n	%	n	%	n	%	n	%
I make my own decisions in regard to what is to be done in my work.	4.04	1	4.2	3	12.5	2	8.3	9	37.5	6	25.0	3	12.5
I don’t have much opportunity to exercise my own judgment.	2.67	3	12.5	11	45.8	4	16.7	4	16.7	1	4.2	1	4.2
My own decisions are subject to review.	4.88	0	0	0	0	1	4.2	8	33.3	8	33.3	7	29.2
I am my own boss in almost every work-related situation.	2.65	3	13.0	7	30.4	8	34.8	5	21.7	0	0	0	0
Most of my decisions are reviewed by other people.	4.21	0	0	1	4.2	4	16.7	12	50.0	3	12.5	4	16.7

*Abbreviations: STD: Strongly Disagree; D: Disagree; SLD: Slightly Disagree; SLA: Slightly Agree; A: Agree; STA: Strongly Agree.*

*Demographic group differences.* An independent t-test sample was used to determine if means for each demographic category of gender, age, professional organization membership, or future educational plans results were statistically significant using the total autonomy construct score. Differences in the means in the demographic categories of gender, age, membership in a professional organization, or plans to pursue additional education were not statistically significant.

**Sense of belonging.** Sense of belonging is formed by the experiences of an individual. Focus group interviews were conducted and qualitatively analyzed. Eight of 24 survey respondents (33.3%) participated in the focus group interviews. All focus group interview transcripts were open coded. After completion of open coding, the codes

were categorized into themes. Table 9 contains the codes and categories identified in the focus group interviews of new clinical laboratory science graduates.

Table 9. New Clinical Laboratory Science Graduates Open Coding and Categories.

Category	Codes
Formal education	Discovery of CLS profession Other career choices Reasons chose CLS as a career Preparedness for clinical experience
Experiences in the clinical laboratory environment	Independent practice as clinical laboratory scientist Joining the CLS profession Dream busters Favorite area of laboratory
Current career goals	Size of facility where employed Factors contributing to choosing current place of employment Plan to stay in current position Future educational plans Advancement opportunities
The CLS profession	Professional organizations Role of a clinical laboratory scientist Laboratory visibility

Several themes emerged from the focus group interviews including new CLS graduates are members of the profession, are excited to be a member, and plan to remain in the CLS profession for more than five years. At the time of focus group interviews, the primary experience that influenced these new CLS graduates' sense of belonging to the CLS profession was the required clinical internship. New CLS graduates identified a shift from student to a CLS professional as having occurred at some point during the required clinical internship.

*Yes, probably after about 2/3 of the way in (my clinical internship). By then I knew how to do just about everything in the lab so I was doing a lot of the lab work. However they didn't treat me as if it was my responsibility to do the work. I could have been less involved if I'd wanted to.*

*I came in as a student and developed into a coworker. My favorite rotation was Blood Bank and I actually handled all the calls and QC as well as chemistry with the calibrations and so forth. They considered me a worker and said many times they wanted to hire me.*

Newly graduated clinical laboratory scientists expressed a positive viewpoint about the CLS profession. The individuals are confident with the skills they have acquired during formal education. One focus group respondent expressed the confidence as:

*I feel very confident about being an independent CLS. Maybe it sounds conceited, but I really feel like I am going to be a great CLS. The education and clinical internships prepared me well.*

The newly graduated clinical laboratory scientist recognizes that the CLS profession is perceived by its members as invisible to non-members. Examples demonstrating the lack of visibility of the CLS profession include:

*I think the other team players in the hospital (some doctors, nurses, etc...) need to be actually informed about what we do as lab professionals. So they better understand us.*

Lastly, the newly graduated clinical laboratory scientists anticipate short-term CLS career advancement opportunities and hope to pursue advanced education within the profession. One respondent shared the enticement of job promotion to accept a position at the same site at which the student did a rotation:

*I think there are rumors of a promotion if things go well. We'll see; lots of promises were made to get me to stay.*

In addition, of the eight individuals who were interviewed, only two participants did not indicate that they had future goals of pursuing advanced education in clinical laboratory science.

## **Research Question 2: What Professional Attributes (Attitudes and Behaviors) and Characteristics Defining Sense of Belonging Are Expressed by Novice Clinical Laboratory Scientists?**

Clinical laboratory scientists with one to three years of experience have had more time working in a clinical laboratory, yet they are still considered by the profession to be “novices” because they do not yet meet the criteria for more advanced licensure qualifications. The extra time these early career clinical laboratory scientists have had in the clinical laboratory has allowed for additional experiences that influence their attitudes and behaviors and the sense of belonging to the CLS profession.

**Demographic characteristics.** Each participant, who completed the revised Hall’s Professionalism Scale (1968) as adapted by Snizek (1972), was asked to indicate several demographic items. Respondents were asked to identify gender, age, membership in professional organizations, years of experience, and future educational plans. Table 10 provides the demographic data for novice clinical laboratory scientists.

The frequency and distribution of demographic characteristics for novice clinical laboratory scientists was similar to that of the newly graduated CLS group with regard to gender, professional organization membership, and future educational plans. A higher percentage of females compared to males participated in the study, 52.3% compared to 47.6%, respectively. A majority of novice clinical laboratory scientists (76.2%) were members of a professional organization and 61.9% did not indicate future plans to pursue further education. The one piece of demographic data that was different was age. Most novice clinical laboratory scientists (61.9%) were older than 25 years of age.

**Professional attributes.** Attitudes and behaviors of novice clinical laboratory scientists were assessed using the revised Hall’s Professionalism Scale (1968). The

Table 10. Demographic Characteristics for Respondents With One to Three Year(s) of Work Experience.

Characteristics		n
Gender	Male	10
	Female	11
Age	< 25 years old	8
	≥ 25 years old	13
Professional Organizations	None	5
	One or more professional organization	16
Future Educational Plans	Yes	8
	No	13

scale’s questions are categorized into five constructs: professional organizations, duty to the public, self-regulation, calling to the field, and autonomy.

***Professional organizations.*** The professional organizations construct of Hall’s Professionalism Scale (1968) was five questions that focused on support and involvement in laboratory-based professional organizations. Novice clinical laboratory scientists indicated that the professional organization is a recognized component in the profession. All novice clinical laboratory scientists (n=21) indicated agreement that CLS professional organizations should be supported. The novice clinical laboratory scientist may not be aware of the different types of services offered by professional organizations, as 61.9% agreed with the statement, “The professional organization doesn’t really do too much for the average member.”

A second piece of the professional organizations construct was the incorporation of behaviors related to professional development. The behaviors adopted by novice

clinical laboratory scientists include systematically reading professional journals, 52.4% (n=11), and attending professional meetings, 71.9% (n=13). Although the majority of the novice clinical laboratory scientists indicated “systematic reading of professional journals,” this result is countered by their reporting that they (57.1%) may not read the journals “too often.” Table 11 contains the means, frequencies, and percentages of responses for each question in the professional organizations construct for novice clinical laboratory scientists.

*Demographic group differences.* An independent t-test sample was used to determine if the demographic groups, age, gender, membership in a professional organization, or future education plan resulted in differences in the score for questions in the professional organizations construct. All demographic variables’ mean differences were found to be statistically insignificant.

*Duty to the public.* The duty to the public construct of Hall’s Professionalism Scale (1968) had five questions that focused on the role of the clinical laboratory science profession to others. Novice clinical laboratory scientists recognize that the CLS profession is vital to all members of society (90.4%, n=19). The novice clinical laboratory scientists indicated moderate support that the CLS profession is essential (57.1%, n=12), important (52.3%, n=12), and indispensable (66.7%, n=14). Lastly, novice clinical laboratory scientists (90.5%, n=19) indicated that the clinical laboratory science profession’s importance is not overstressed. In Table 12 are the means and distribution of responses for the revised Hall’s Professionalism Scale (1968) duty to the public construct for novice clinical laboratory scientists.

Table 11. Descriptive Statistics Including Mean, Frequency, and Distribution for Novice Clinical Laboratory Scientists With One to Three Year(s) of Experience in Hall's Professionalism Scale (1968) Professional Organizations Construct.

Question	Mean	STD		D		SLD		SLA		A		STA	
		n	%	n	%	n	%	n	%	n	%	n	%
I systematically read the professional journals.	3.24	4	19.0	3	14.3	3	14.3	6	28.6	5	23.8	0	0
I attend professional meetings at the local level.	3.52	3	14.3	5	23.8	0	0	5	23.8	7	33.3	1	4.8
I believe that professional organizations should be supported.	4.95	0	0	0	0	0	0	5	23.8	12	57.1	4	19.0
The professional organization doesn't really do too much for the average member.	3.62	1	4.8	4	19.0	3	14.3	8	38.1	4	19.0	1	4.8
Although I would like to, I really don't read professional journals too often.	3.76	1	4.8	3	14.3	5	23.8	5	23.8	5	23.8	2	9.5

Abbreviations: *STD*: Strongly Disagree; *D*: Disagree; *SLD*: Slightly Disagree; *SLA*: Slightly Agree; *A*: Agree; *STA*: Strongly Agree.

**Demographic group differences.** Demographic information was collected in the categories of gender, age, membership in a professional organization, and future educational plans. An independent t-test sample was performed for each demographic category using the total duty to the public construct score. The mean differences for age, gender, professional organization membership, and future educational plans were found to be statistically insignificant.

**Self-regulation.** In the self-regulation construct, five survey questions addressed the ability of the CLS profession to evaluate the competency and quality of its members. Novice clinical laboratory scientists indicated that the CLS profession is regulated by the members of the profession, as 85.7% (n=18) indicated agreement that other colleagues



are aware of each other's competence. The novice clinical laboratory scientist also believes that the CLS profession offers opportunities to judge others' work, as 76.2% (n=16) indicated agreement to this question.

Table 12. Descriptive Statistics Including Mean, Frequency, and Distribution for Novice Clinical Laboratory Scientists With One to Three Year(s) of Experience in Hall's Professionalism Scale (1968) Duty to the Public Construct.

Question	Mean	STD		D		SLD		SLA		A		STA	
		n	%	n	%	n	%	n	%	n	%	n	%
Other professions are actually more vital to society than mine.	2.38	4	19.0	10	47.6	5	23.8	0	0	1	4.8	1	4.8
I think that my profession, more than any other, is essential for society.	3.48	1	4.8	2	9.5	6	28.6	10	47.6	2	9.5	0	0
The importance of my profession is sometimes overstressed.	2.38	3	14.3	10	47.6	6	28.6	1	4.8	1	4.8	0	0
Some other occupations are actually more important to society than is mine.	3.33	0	0	7	33.3	4	19.0	8	38.1	0	0	2	9.5
If ever an occupation is indispensable, it is this one.	3.67	2	9.5	2	9.5	3	14.3	8	38.1	6	28.6	0	0

Abbreviations: STD: Strongly Disagree; D: Disagree; SLD: Slightly Disagree; SLA: Slightly Agree; A: Agree; STA: Strongly Agree.

Novice clinical laboratory scientists indicated that the profession is able to assess the work quality of its members. In this study, 61.9% (n=13) of novice clinical laboratory scientists disagreed with the statement, "A problem in this profession is that no one really knows what his colleagues are doing." Table 13 provides the mean and distribution of responses for each question of the revised Hall's Professionalism Scale (1968) self-regulation construct.

Table 13. Descriptive Statistics Including Mean, Frequency, and Distribution for Novice Clinical Laboratory Scientists With One to Three Year(s) of Experience in Hall's Professionalism Scale (1968) Self-regulation Construct.

Question	Mean	STD		D		SLD		SLA		A		STA	
		n	%	n	%	n	%	n	%	n	%	n	%
My fellow professionals have a pretty good idea about each other's competence.	4.24	1	4.8	1	4.8	3	14.3	5	23.8	9	42.9	2	9.5
A problem in this profession is that no one really knows what his colleagues are doing.	3.33	1	4.8	8	38.1	4	19.0	1	4.8	5	23.8	2	9.5
We really have no way of judging each other's competence.	2.62	4	19.0	6	28.6	7	33.3	2	9.5	2	9.5	0	0
There is not much opportunity to judge how another person does his work.	2.71	3	14.3	7	33.3	6	28.6	3	14.3	2	9.5	0	0
My colleagues pretty well know how well we all do in our work.	4.38	1	4.8	1	4.8	1	4.8	6	28.6	10	47.6	2	9.5

Abbreviations: STD: Strongly Disagree; D: Disagree; SLD: Slightly Disagree; SLA: Slightly Agree; A: Agree; STA: Strongly Agree.

*Demographic group differences.* An independent t-test sample was used to determine if gender, age, professional organization membership, or future educational plans resulted in differences in the self-regulation construct score for individuals with one to three years of work experience as a clinical laboratory scientist. Differences in the means for the demographic groups of gender, age, professional organization membership, and future educational plans were found to be statistically insignificant.

*Calling to the field.* The fourth construct in revised Hall's Professionalism Scale (1968) is calling to the field. The calling to the field construct consists of five questions whose statements focus on the dedication of the members of the CLS profession. The

mean calling to the field construct score was 3.81. Table 14 provides means and distribution of responses for novice clinical laboratory scientists for the five items in the calling to the field construct.

Table 14. Descriptive Statistics Including Mean, Frequency, and Distribution for Novice Clinical Laboratory Scientists With One to Three Year(s) of Experience in Hall's Professionalism Scale (1968) Calling to the Field Construct.

Question	Mean	STD		D		SLD		SLA		A		STA	
		n	%	n	%	n	%	n	%	n	%	n	%
People in this profession have a real "calling" for their work.	4.00	1	4.8	3	14.3	1	4.8	6	28.6	10	47.6	0	0
The dedication of people in this field is most gratifying.	3.71	1	4.8	6	28.6	1	4.8	4	19.0	8	38.1	1	4.8
It is encouraging to see the high level of idealism which is maintained by people in this field.	3.86	1	4.8	0	0	0	0	6	28.6	8	38.1	6	28.6
Most people would stay in the profession even if their incomes were reduced.	3.00	3	14.3	3	14.3	9	42.9	4	19.0	1	4.8	1	4.8
There are very few people who don't really believe in their work.	3.67	1	4.8	2	9.5	6	28.6	6	28.6	6	28.6	0	0

*Abbreviations: STD: Strongly Disagree; D: Disagree; SLD: Slightly Disagree; SLA: Slightly Agree; A: Agree; STA: Strongly Agree.*

Responses indicated that 76.2% (n=16) novice clinical laboratory scientists view that CLS members have a "calling" to the profession. Novice clinical laboratory scientists are encouraged by the ideals (95.2%, n=20) and dedication (61.7%, n=13) maintained by CLS professionals. The survey item that had the lowest mean for the novice clinical laboratory scientists was related to pay. Novice clinical laboratory scientists (71.5%, n=15) indicated that people may leave the profession if pay was reduced.

*Demographic group differences.* An independent t-test sample was performed to determine if there were significant differences in the means for each of the demographic categories. The differences in means for gender, age, professional organization membership, or future educational plans were not statistically significant.

**Autonomy.** The final construct in revised Hall's Professionalism Scale (1968) is autonomy. The construct of autonomy consists of five survey items that focus on the ability of an individual to freely perform job responsibilities. Table 15 lists the mean and response distributions for novice clinical laboratory scientists for each survey item. The data revealed that novice clinical laboratory scientists have had opportunities to exercise their own judgment (76.2%, n=16) and independently managed their work duties (71.4%, n=15). They did feel, however, that the decisions they made were subject to review by others (76.2%, n=16), but a lower number of novice clinical laboratory scientists indicated agreement that "most" of their decisions (66.6%, n=14) are subject to review.

*Demographic group differences.* An independent t-test sample was used to determine if there were significant differences in the means for each demographic group. Demographic groups included gender, age, professional organization membership, and future educational plans. The differences in the means for the total autonomy construct score using each demographic category groupings were not statistically significant.

**Sense of belonging.** Sense of belonging is formed by the experiences of an individual. Novice clinical laboratory scientists have had additional time and experiences in the workplace setting that may result in transformation of their sense of belonging to the CLS profession. Focus group interviews were conducted with three individuals,

Table 15. Descriptive Statistics Including Mean, Frequency, and Distribution for Novice Clinical Laboratory Scientists With One to Three Year(s) of Experience in Hall's Professionalism Scale (1968) Autonomy Construct.

Question	Mean	STD		D		SLD		SLA		A		STA	
		n	%	n	%	n	%	n	%	n	%	n	%
I make my own decisions in regards to what is to be done in my work.	3.71	2	9.5	0	0	4	19.0	12	57.1	2	9.5	1	4.8
I don't have much opportunity to exercise my own judgments.	2.90	2	9.5	6	28.6	8	38.1	3	14.3	1	4.8	1	4.8
My own decisions are subject to review.	4.38	1	4.8	0	0	4	19.0	5	23.8	7	33.3	4	19.0
I am my own boss in almost every work-related situation.	3.05	2	9.5	5	23.8	7	33.3	4	19.0	3	14.3	0	0
Most of my decisions are reviewed by other people.	3.55	2	9.5	4	19.0	2	9.5	6	28.6	5	23.8	1	4.8

Abbreviations: *STD*: Strongly Disagree; *D*: Disagree; *SLD*: Slightly Disagree; *SLA*: Slightly Agree; *A*: Agree; *STA*: Strongly Agree.

14.2% of the survey respondents. The individual interviews were open coded. After coding, responses were categorized into themes. Table 16 contains coding and categories of the focus group interviews.

Several themes emerged from the focus group interview including an overall frustration towards more experienced colleagues, a desire to find an individual "niche," and a desire to obtain new job responsibilities. Novice clinical laboratory scientists indicated that one of the more difficult aspects of the profession is working with fellow clinical laboratory scientists who have negative attitudes towards the profession. One respondent shared that one of the main reasons why a job change might be in the person's future is primarily due to the workplace culture of the laboratory:

Table 16. Novice Clinical Laboratory Scientist Categories and Codes of Qualitative Data.

Category	Codes
Previous experiences	Discovery of CLS profession Reasons CLS was chosen profession Clinical internship experiences Initial CLS position
Members of the profession of CLS	Colleagues Current CLS position Work environment Future career plans Extra responsibilities
The profession of CLS	Professional organizations Strengths of CLS profession Weakness of CLS profession Challenges to the profession of CLS Role of a clinical laboratory scientist Visibility of the profession

*At times there is too much drama in the laboratory between coworkers. It's hard working with women who have been there for 20-30 years.*

The frustrations caused by the current workplace environment resulted in each of the focus group participants indicating that they had recently considered a job change. One novice clinical laboratory scientist had already found and accepted a position as a clinical laboratory scientist in a different laboratory, while a second focus group member only planned on remaining in the current position for approximately six more months.

The novice clinical laboratory scientists also indicated that they wanted additional work responsibilities. One respondent described current job duties as an “equipment trouble-shooter” instead of a clinical laboratory scientist. Ways that respondents were seeking out new responsibilities included movement out of their current positions. One was moving into a more advanced position in industry, one planned on moving to a

specialized position in a single laboratory department, and one will be moving into a managerial role. All three focus group participants expressed little intent to remain at the “staff” level, known in the CLS profession as a “generalist.”

**Research Question 3: What Are the Differences in Professional Attributes (Attitudes and Behaviors) and Characteristics Defining Sense of Belonging Expressed by New Clinical Laboratory Science Graduates Compared to Novice Clinical Laboratory Scientists?**

**Professional attributes.** To identify differences in attitudes and behaviors identified by clinical laboratory scientists with either less than one (newly graduated) or more than one to three year(s) work experience (novice), inferential statistics were used to compare and contrast the total construct score for both groups for each of the five constructs in the revised Hall’s Professionalism Scale (1968).

Inferential statistics for each construct included the independent t-test sample and the Mann-Whitney U test. Due to the small sample size, the Mann-Whitney U test was also used to evaluate differences in the two different work experience groups.

New CLS graduates had higher means for four of the five constructs. The four constructs in this category included professional organizations, duty to the public, calling to the field, and self-regulation. The difference in means for each total construct score was not found to be statistically significant, however. A Mann-Whitney U test was also found to lack statistical significance for total scores for the professional organizations, duty to the public, and calling to the field constructs.

New CLS graduates had a higher total self-regulation construct score than novice clinical laboratory scientists. The mean for new CLS graduates was 4.56 (sd = 4.56)

compared to the novice clinical laboratory scientists' mean of 4.14 (sd = 4.17). The difference in the means was found to be statistically significant ( $t(43) = 31.6, p < 0.05$ ). The differences in means would be expected, as new CLS graduates would be more closely supervised on a regular basis than those who had more work experience and thus had demonstrated the ability to perform quality work independently.

Novice clinical laboratory scientists had a higher total autonomy score ( $m = 3.56, sd = .842$ ) compared to new CLS graduates ( $m = 3.47, sd = .958$ ). A higher score in autonomy is expected for novice clinical laboratory scientists, as the members of this group should be performing assigned job tasks independently on a day-to-day basis. The difference in means was found to be statistically insignificant, however ( $t(43) = -.333, p > 0.05$ ). A Mann-Whitney U test was also found to be statistically insignificant.

**Sense of belonging.** Three basic themes emerged through the focus group interviews that demonstrated a different sense of belonging between the participants based on years of work experience. Table 17 provides a comparison and examples from interview transcripts that indicate a different sense of belonging to the clinical laboratory science profession.

The general topics that differed based on time spent in the clinical laboratory workforce were current career goals, future career goals, and their viewpoint regarding the attitudes of more experienced clinical laboratory science professionals. The change in sense of belonging to the clinical laboratory science profession indicated that new professionals in the CLS profession experience a transition phase as they move away from the ideals formed as a student to those of the practicing professional.



Table 17. Variations in the Sense of Belonging of New Clinical Laboratory Science Graduates Compared to Novice Clinical Laboratory Scientists.

Topics	New CLS Graduate	Novice Clinical Laboratory Scientist
Current career goals	Want to work at a small facility to gain experience before moving to a larger facility or specialty.	Have left first position and shifted to a different hospital. <i>After I graduated and passed the boards I was employed there as a night shift med tech for a little over 2 years. I currently am employed on a rotating scheduling in a large health care facility in a major metropolitan area.</i>
	Interview Question: Where have you been hired to work? <i>A smaller facility as a generalist, where I will be doing all departments in the lab every day (rotating phlebotomy)</i>	<i>Stayed in my first position for a little more than eight months, moved to a different state and have been employed in a facility for a little over a year. At the end of the month I will be taking a new position in a different state.</i>
	<i>As things go right now; a hospital with about 25-30 beds</i>	
	Want to stay in current position for a period less than five years.	
	Interview Question: How long do you plan on staying at your place of hire? <i>The plan is for about 4 years</i>	Have sought out extra responsibility. <i>I am the head of the Chemistry Department.</i>
	<i>At least 2 years I would say</i>	<i>Been offered a position of laboratory manager in a different state. Will be relocating to become a laboratory manager with less than three years of full-time experience.</i>
Expect career advancement opportunities. <i>I think there are rumors of a promotion if things go well. (we'll see, lots of promises were made to get me to stay, so if any of them come true I'll be happy)</i>	Looking for a niche. <i>I think I may try working in a microbiology laboratory lab first and see how I like that.</i>  <i>I like working in the lab. I don't have much interest in transferring to an area of health care where I would be dealing directly with patients routinely. I would like to make this profession work for me.</i>	

Table 17 cont.

Topics	New CLS Graduate	Novice Clinical Laboratory Scientist
Future career goals	<p>Plan to seek an advanced education in clinical laboratory science.</p> <p><i>I do want to get my masters</i></p> <p><i>Start my masters</i></p> <p><i>I want to go on and get more education in lab management-related issues.</i></p>	<p>Sometimes feel like knowledge is underutilized.</p> <p><i>Sometimes I feel more like a troubleshooting expert for qc or instrument breakdowns than a medical professional.</i></p> <p>May leave field for other health care positions.</p> <p><i>Lately I've been debating looking for a job with a large corporation like Siemens or Beckman Coulter.</i></p> <p><i>Eventually I'd like to go back and get my RN.</i></p>
CLS colleagues	<p>More experienced techs are unfriendly to early career colleagues.</p> <p><i>I think there were some areas that the techs did not want me to be in there "territory" so to speak.</i></p> <p><i>I make others feel uncomfortable and they don't want to work by me.</i></p>	<p>Laboratory climate needs to change to retain workers.</p> <p><i>There is a lot of negativity out there about this profession, mostly from the people who have been doing it the longest.</i></p> <p><i>At times there is too much drama in the laboratory between coworkers. It's hard working with women who have been there for 20-30 years.</i></p> <p>The question item from Hall's Professionalism Scale (1968) as adapted by Snizek (1972) stated, "It is encouraging to see the high level of idealism which is maintained by people in this field." Respondents with 1-3 year(s) of experience reported a lower agreement to this statement than respondents with less than one year of experience. The results were found to be statistically significant, <math>t(43) = 2.232</math>, <math>p &lt; 0.05</math>.</p>

Based on the findings of this study, new clinical laboratory scientist graduates choose to work in smaller facilities to gain knowledge and experience with the intent to remain in the initial place of employment for at least two years. In addition, future career

goals are related to advancement within the field of clinical laboratory science. Last but not least, the new CLS graduate had negative encounters with more experienced colleagues in the CLS profession. The negative interactions resulted in the new CLS graduate having a viewpoint that more experienced clinical laboratory scientists may be intimidated by the level of knowledge of a new professional.

In this study, novice clinical laboratory scientists have either moved to a larger laboratory than the original place of employment after graduation or will be moving into an entry-level managerial role. In addition, all focus group respondents described a desire to find a laboratory niche either by leaving the CLS profession for another allied health profession, moving out of the clinical laboratory into supportive biotechnology industry positions, or staying within the CLS profession, but moving towards greater work responsibilities.

**Research Question 4: What Experiences and Feelings Are Expressed by Early Career Clinical Laboratory Scientists in Regards to Educational Preparation, Future Career Goals, and Intent to Remain in the CLS Profession?**

Two recurrent themes emerged from the qualitative data. The two themes were not solely found in either of the two groups but recurrent in both the new CLS graduate and novice clinical laboratory scientist groups. The two themes were early career clinical laboratory scientists are members of the CLS profession and the CLS profession is important but an invisible profession.

**Members of the clinical laboratory science profession.** Early career clinical laboratory scientists have joined the CLS profession. Indicators that new professionals are members of the profession include membership in a professional organization. Early

career clinical laboratory scientists, 69.9% of all responses, identified membership in at least one professional organization. Furthermore, 67.7% of survey respondents indicated membership in at least one of the two prominent professional organizations, the American Society for Clinical Laboratory Science (ASCLS) or the American Society for Clinical Pathology (ASCP).

Focus group interviews revealed that 2 of 11 participants had become involved as leaders in a laboratory professional organization. Each participant had been elected to a statewide board position and both were able to attend a national level annual meeting. In addition, one participant has been continually involved at the statewide level of a professional organization for each of the first three years since entering the CLS profession.

**CLS is an important but invisible profession.** During the focus groups, the importance of the CLS profession was repeatedly discussed by each focus group participant. The following comments were made to describe the role of the CLS profession by one of these early career clinical laboratory scientists:

*It is an honorable profession that is part of health care. Health care would almost cease to exist without the role CLS plays.*

Another respondent summarized the importance of the CLS profession from using a life-and-death viewpoint:

*It's good to feel like you have contributed to saving someone's life.*

Comments also indicated that they felt that the profession of clinical laboratory science was invisible. This invisible nature has led clinical laboratory scientists to perceive the general public's unawareness of the profession as a lack of respect.

Examples from the focus group interviews that demonstrate the invisible nature of the profession include:

*There is little known about our profession. I feel other professions don't realize the amount of education we have or what kind of work goes into keeping a lab accredited.*

The same focus group participant continued to try to explain this viewpoint of invisibility with the following statement:

*It is an integral part of the health care system and should be held with higher regards than it is.*

**Research Question 5: What Stage of Professional Socialization Is Exhibited by New Clinical Laboratory Science Graduates Compared to More Experienced Novice Clinical Laboratory Scientists?**

New CLS graduates and novice clinical laboratory scientists are at different phases of professional socialization. Both groups of early career laboratory scientists have entered into the practice of clinical laboratory science; yet, the experiences encountered by the novice clinical laboratory scientist have resulted in this group of study participants transitioning into a different stage of professional socialization.

New CLS graduates have formed an initial professional identity based primarily on the clinical internship experiences they have recently completed. The new CLS graduates have a positive sense of belonging to the field of the CLS profession. This sense of belonging is indicated since the new graduates have chosen to accept an entry-level position in a clinical laboratory. The attitudes and behaviors that are expressed by new CLS graduates may be skewed, as they have not fully matriculated into the more autonomous practice of clinical laboratory science.

The novice clinical laboratory scientist has transitioned into a different stage of the professional socialization process and has had more experiences in addition to the previous student experiences. The new experiences influenced the ideals that were present when they were new CLS graduates. The new experiences have been both positives and negative, and have resulted in differences in professional attributes and sense of belonging expressed by the novice clinical laboratory scientist. A novice clinical laboratory scientist expresses a sense of belonging to the CLS profession, but at this stage of professional socialization individuals are choosing to either remain or leave the CLS profession.

## **CHAPTER V**

### **DISCUSSION AND CONCLUSIONS**

#### **Summary**

This study examined the phenomena of professional socialization in early career clinical laboratory scientists who have less than three years of work experience in the medical laboratory environment. Early career clinical laboratory scientists are highly skilled and have the education needed to be considered “ready” to become clinical laboratory science practitioners (Beck & Doig, 2002).

In the United States, a severe workforce shortage of certified clinical laboratory scientists has existed for more than 20 years (Hansen & Lavanty, 2001; Kaplan & Burgess, 2010; Karni, 1993; Thompson et al., 2009). The severe workforce shortage has been created due to several factors including a decrease in the number of new graduates entering the workforce, poor retention of practicing clinical laboratory scientists, and an increase in the number of experienced clinical laboratory scientists who are retiring. Since the clinical laboratory science profession cannot quickly increase the number of new graduates or stop experienced clinical laboratory scientists from retirement, the profession needs to identify ways to increase the retention of early career clinical laboratory scientists. Other allied health professions that have also faced workforce shortages have looked at the process of professional socialization in an attempt to increase retention of qualified personnel (Hatoum & Smith, 1987; Mooney, 2007;

Pitney et al., 2002). In this study, the researcher sought to study the professional socialization of early career clinical laboratory scientists, in the hopes of uncovering possible factors that, if changed, could increase retention of early career clinical laboratory scientists.

Professional socialization is a conceptual framework that describes a process in which an individual moves from being an outsider to being a member of a chosen profession. The conceptual model of professional socialization is unique for each profession. Professional socialization has not been studied in the profession of clinical laboratory science. The purpose of this study was to identify the professional attributes, sense of belonging, and professional socialization of clinical laboratory scientists with less than three years of work experience.

Using a mixed method research approach, the following research questions were investigated:

1. What professional attributes (attitudes and behaviors) and characteristics defining sense of belonging are expressed by new clinical laboratory science graduates?
2. What professional attributes (attitudes and behaviors) and characteristics defining sense of belonging are expressed by novice clinical laboratory scientists?
3. What are the differences in professional attributes (attitudes and behaviors) and characteristics defining sense of belonging expressed by new clinical laboratory science graduates compared to novice clinical laboratory scientists?



4. What experiences and feelings are expressed by early career clinical laboratory scientists in regards to educational preparation, future career goals, and intent to remain in the CLS profession?
5. What stage of professional socialization is exhibited by new clinical laboratory science graduates compared to the more experienced novice clinical laboratory scientists?

## **Discussion**

### **New CLS Graduates**

**Professional attributes.** The Hall's Professionalism Scale (1968) was designed to measure the attitudes and behaviors that correlate with attributes associated with professionals across many disciplines (Blezek, 1987; Breeden et al., 2000; Hall, 1968; Shafer et al., 2000; Snizek, 1972). The new CLS graduates expressed high levels of these attitudes and behaviors and can, as such, be considered professionals.

The role of the professional organization was the first topic that was studied using Hall's Professionalism Scale (1968). Total construct scores indicated that these new graduates understand and value their professional organizations. They attend meetings and, although they may not always read professional journals, they feel the need to do so.

The regulation of the CLS profession by its members was the second construct in Hall's Professionalism Scale (1968). Newly graduated clinical laboratory scientists are aware that the profession of CLS is highly regulated by its members. Since each clinical laboratory scientist is expected to annually pass federally mandated competency assessments, the recognition that the profession is well regulated is not an unexpected finding. It indicates, however, that these new clinical laboratory science professionals are

aware of how the CLS profession is regulated and that they understand that every member of the profession plays a role in this self-regulation, including them.

Another construct that was evaluated using Hall's Professionalism Scale (1968) was the level of autonomy that was expressed by new CLS graduates. In this study, new CLS graduates indicated that more experienced clinical laboratory scientists do not recognize the new graduate as fully qualified to practice the profession independently. Even though new CLS graduates passed entry-level board certification examinations, their completion of job duties continued to be scrutinized by more experienced clinical laboratory scientists. As a result of this increased scrutiny, the new CLS graduate does not exhibit the professional attributes associated with autonomy. The responses by new CLS graduates indicated that this group of professionals has not achieved the right to autonomous practice. Despite a lack of professional autonomy, new CLS graduates indicated that they understand their duty to the public and feel a strong calling to the field of CLS.

**Sense of belonging.** A second piece of this study was to qualitatively research the sense of belonging of early career clinical laboratory scientists. Sense of belonging was studied using online focus group interviews. New clinical laboratory scientists have established a sense of belonging to the CLS profession. Study findings that indicated a sense of belonging to the CLS profession included a personal identification of transitioning from student to practitioner, an intent to remain in the CLS profession long term, and plans to pursue advanced education in the CLS profession. The sense of belonging was formed based on the experiences encountered in an educational setting, and most especially during their internship practicums.

The sense of belonging expressed by the new CLS graduate is one that indicates a desire to pursue a career in clinical laboratory science. Although an initial sense of belonging may be felt during their coursework at the university, it really begins to develop or emerge during the final months of the student internship. The CLS student begins to identify more with more experienced clinical laboratory scientists and less with their role of student. The feelings of identification with the CLS profession expressed by these new graduates is similar to the transition of a new graduate nurse that was found by Mooney in his 2007 study and by Almada et al. in their 2004 study.

New CLS graduates reported that they plan on remaining in the CLS profession long term. This finding contradicts the findings of Monahan (2001) and Spannaus-Martin (1997) that new graduates are viewing the field of clinical laboratory science as solely a stepping stone for other advanced health care professions such as medical doctor or physician assistant. If further education was a career plan, new CLS graduates indicated that they specifically intended to pursue graduate studies in clinical laboratory science. This finding is particularly important, as it may indicate that CLS programs are graduating a cadre of students who want this particular profession and can see their fit within, above, and beyond all others. Lastly, these new CLS graduates have stated that they expect to encounter advancement and promotion opportunities in the CLS profession. An expectation of advancement by early career clinical laboratory scientists supports the findings of McClure (2009).

New graduates recognized and are comfortable and confident that they have the skills and knowledge that they need for the performance of the job duties of the CLS profession. While the graduates feel well prepared to enter the workforce, there is

recognition that additional work experience will enhance these skills and allow for knowledge to be not only memorized for the purposes of passing university or licensure tests, but also applied on a daily basis in the performance of their duties. This finding is similar to and supports the findings of Beck and Doig (2002) regarding the preparedness of new clinical laboratory scientists.

A challenge identified by new CLS graduates with regard to their professional identity within the CLS profession was the lack of understanding by non-members of the importance of the CLS profession in providing quality health care. This finding supports previous studies of more experienced CLS professionals in that each study identified that the profession is important but not visible to other health care professions or to the general public (LaCroix, Bean, & Chandler, 1993; McClure, 2009; Polansky, 2004).

**Professional socialization.** In this study, the researcher found evidence to suggest that the CLS professional socialization process begins during the formal education of future professionals, which is similar to the professional socialization model proposed previously by Rosch and Reich (1996). While other professions such as nursing (MacLellan et al., 2011) and social work (Miller, 2010) have indicated that their professional socialization actually begins prior to individuals entering their formal education, this study could not support this finding in CLS because many of the study participants did not find out about the profession until after their enrollment in a higher education setting.

With regard to the specific stage of professional socialization of these early career CLS professionals, the researcher found that it was evolving as they became more immersed into the workforce as entry-level employees. When the early career clinical

laboratory scientists entered the workforce, new expectations and responsibilities challenged pre-existing experiences that were encountered as part of CLS education. The challenge of difference in ideals versus practice has been described as “reality shock” by Kramer (1974) and these CLS professionals also expressed this shock.

New CLS graduates identified a sense of belonging to the CLS profession and have also incorporated positive attitudes and behaviors. The professional socialization stage of new CLS graduates who have just begun their practice as clinical laboratory scientists can be categorized as equivalent to the encounter stage of Rosch and Reich’s (1996) higher education model. The new CLS graduates have experienced change, as the professional ideals that were originally established during formal education evolved through clinical internship experiences and were strengthened by the recruitment process these new graduates experienced as part of their search for their first position. The new CLS graduates expressed readiness to complete work duties and the expectation of achieving promotion as a short-term professional goal. The new CLS graduates have not been able to become completely immersed in the laboratory environment as true clinical laboratory scientists, but they have begun the process.

### **Novice Clinical Laboratory Scientists**

**Professional attributes.** The Hall’s Professionalism Scale (1968) was used to quantitatively measure the professional attributes (behaviors and attitudes) of the novice clinical laboratory scientists. Novice clinical laboratory scientists are those in the profession who have one to three years of experience. As one would expect, these novice clinical laboratory scientists did indicate that they viewed themselves as members of the CLS profession. Novice clinical laboratory scientists, similar to the new CLS graduates,

expressed high levels of agreement in all five constructs of Hall's Professionalism Scale (1968).

The first construct of Hall's Professionalism Scale (1968) examined their perception of the role of the professional organization. Novice clinical laboratory scientists expressed attitudes and behaviors that demonstrated a strong agreement that the professional organization was important to the CLS profession. Behaviors that indicated involvement in the professional organization included membership in a laboratory professional organization, participation in professional organization events, and reading of professional journals.

The second construct of Hall's Professionalism Scale (1968) focused on the role of the CLS profession and its duty to the general public. This study found that novice clinical laboratory scientists felt that the profession is vital and essential for all people. The findings in the construct support that members of the CLS profession view themselves as integral members of the health care team and that the laboratory results they provide aid in the treatment of disease but, because of established requirements, they are still not far enough along in their careers to qualify for more advanced specialty certification in the profession.

The third construct of Hall's Professionalism Scale (1968) examined novice clinical laboratory scientists' view of the self-regulation of the profession. Novice clinical laboratory scientists identified that the CLS profession is well regulated. A high level of agreement in regards to the self-regulation of the CLS profession was expected by the researcher, as the profession is regulated by existing federal mandates. As a part of federal regulations, all clinical laboratory scientists are expected to pass annual

competency evaluations that demonstrate knowledge and proficiency. These results show, however, that these novice clinical laboratory science professionals are aware that they must meet and maintain certain standards to continue in their chosen profession.

The fourth construct of Hall's Professionalism Scale (1968) focused on the dedication of novice clinical laboratory scientists to the CLS profession. Novice clinical laboratory scientists indicated that the CLS profession requires a "calling" to the field. In addition, novice clinical laboratory scientists indicated that CLS professionals are dedicated and have high professional ideals. One area within this construct that novice clinical laboratory scientists indicated disagreement with was in regards to personal compensation. They indicated that clinical laboratory scientists may not remain in the field if pay was reduced. This finding supports McClure's (2008) study, which found that clinical laboratory scientists did not feel that CLS practitioners were adequately compensated for knowledge and day-to-day job duties.

The final construct in Hall's Professionalism Scale (1968) examined the ability of professionals to practice the CLS profession autonomously. The novice clinical laboratory scientists indicated that they have achieved the right to perform job duties independently. The fact that these novice clinical laboratory scientists now feel that they can and are allowed to practice job duties autonomously is a particularly important finding, as it is considered to be an indicator of increased retention by this study's participants to the CLS profession. Increased independence was linked to an increased likelihood of remaining in the CLS profession in a study previously reported by Doig and Beck (2005). The finding of autonomous practice is not unexpected, however, as the novice group of CLS professionals have completed required new employee training that

new CLS graduates would not have completed at the time of the focus group interviews. Until that training is completed, no CLS professional is allowed by law to practice independently.

**Sense of belonging.** A second piece of this study was to qualitatively examine the sense of belonging to the CLS profession by early career clinical laboratory scientists. Sense of belonging was measured using online focus group interviews. This group of clinical laboratory scientists indicated a sense of belonging that had shifted away from the ideal professional expectations that were previously formed during their formal education to a transformed professional identity which was based on a more realistic view of the profession, as a result of their non-educational experiences and workplace interactions. The transformation from idealism to realism was studied in nursing by Mooney (2007), who found that new nurses whose workplace interactions and experiences were supportive of novice professionals during this transitional period had a higher sense of belonging to the nursing profession and were more likely to remain in their chosen profession. That these novice CLS professionals are transitioning in this way is an important finding, as it will make their retention in the profession more likely to occur, as long as the transition remains positive.

However, a finding that was not anticipated within the novice clinical laboratory scientist group was that the sense of belonging that was occurring did not necessarily equate to an intention to remain in the profession. At the time of focus group interviews, the novice clinical laboratory scientists identified a desire to discover their professional niches. If the novice clinical laboratory scientists were able to find their professional



niches, it increased their sense of belonging to the CLS profession and their desire to remain within the profession.

But, if the novice clinical laboratory scientists expressed their perception that the CLS profession was not challenging for general laboratory staff, which is the initial entry level position for all CLS professionals, then they were more likely to leave the profession. They stated that they were now ready for and wanted their work to be more challenging. Deppoliti (2008) found that new nurses also had a desire to have new challenges in the first three years of practice. Ways that participants in this study have already sought out new challenges in the CLS profession included moving to a larger medical facility and becoming involved in laboratory management. One focus group participant was in the process of deciding if pursuing education in a related health care profession was the best way for him/her to obtain that desired professional challenge. This finding is particularly important because it shows that if the CLS profession is not perceived by new professionals as challenging, then decreased retention rates will continue to occur, further impacting the workforce shortage.

**Professional socialization.** The final component this study examined was how the incorporation of professional attributes and personal experiences influenced the professional socialization of novice clinical laboratory scientists. Professional socialization of novice clinical laboratory scientists was affected by the challenges of actual work expectations, which conflicted with the predetermined ideals that were previously formed when they were students and new graduates. In the field of nursing, the conflict between true work expectations and pre-existing ideals has been defined as a theory-practice gap (Maben et al., 2006).

Novice clinical laboratory scientists indicated that they are still in the process of acclimatizing to the clinical laboratory workplace and expressed movement through a theory-practice gap. As they have tried to negotiate between theories they learned in schools and the realities of the workplace, many of them have sought new challenges in an effort to find their “niche.” The niche is the place where the individual’s theoretical ideal of what being a CLS professional is all about melds or matches with the actual practice they are doing in the workplace.

Findings of this study indicate that novice clinical laboratory scientists have begun to navigate through the theory-practice gap in response to their experiences as inexperienced clinical laboratory scientists in the workplace. The ease or difficulty that was experienced while moving through this defining period influenced the retention of these relatively new professionals. Several novice CLS professionals reported their movement into new positions at different health care facilities than where they were originally hired as new graduates. That this movement has already occurred within the first three years of employment is quite telling and is indicative of the CLS profession experiencing navigation through the theory-practice gap in ways similar to the nursing profession, as was discussed by Price (2008).

A second finding that indicated the influence of the theory-practice gap on the retention of novice clinical laboratory scientists was the expressed frustration with regard to working in a negative work climate. The negative workplace climate has influenced the formation of their new professional identities; those previously established ideals (theory-based) formed early on are being modified because of the workplace climate. Additionally, the novice CLS professionals reported that the negative workplace climate

has influenced them to the extent that they are reflecting upon their desire to remain in the CLS profession. The finding that workplace climate is influencing these professionals to this extent has also been found in the athletic trainers profession by Pitney et al. (2002).

The stage of professional socialization expressed by novice clinical laboratory scientists should reflect the importance of this navigation through the theory-practice gap and their attempts to understand the workplace climate of the clinical laboratory. This increased emphasis on the workplace culture as it relates to the individual professional relates to Rosch and Reich's (1996) professional socialization stage of adaptation. The novice clinical laboratory scientists have moved away from the professional ideals that were formed based on formal education and have adjusted their ideals to match the realities they experience on a day-to-day basis.

If the novice clinical laboratory scientists are able to maneuver through the theory-practice gap, adapt ideals, and learn to navigate the workplace culture, then they will have a greater chance of being retained in the CLS profession. If the retained novice clinical laboratory scientists are able to achieve the desired level of work responsibility and exist in the workplace, then it is predicted that these professionals will transition to the next stage in Rosch and Reich's (1996) model, the commitment stage. If, however, the novice clinical laboratory scientists do not achieve desired job responsibilities, fail to negotiate that theory-practice gap, or navigate the existing workplace climate, then the new clinical laboratory scientists will most likely leave the profession entirely. Mooney (2007) found something similar to this in that the ability of a new nurse to survive the

navigation of the theory-practice gap was the predictor for remaining in the nursing profession.

### **Differences Between New CLS Graduates and Novice Clinical Laboratory Scientists**

In this study, all participants are categorized as early career clinical laboratory scientists. In order for clinical laboratory scientists to be eligible for specialty certification examinations, individuals need to have a minimum of three years of full-time work experience (American Society for Clinical Pathology, 2012). All participants in this study had less than the required three years of full-time work experience and are, therefore, classified as “early career” clinical laboratory scientists. If we can find ways of retaining more of these early career clinical laboratory scientists in their first three years, the workforce shortage can be significantly impacted.

**Professional attributes.** The differences in professional attributes between the new CLS graduates and novice clinical laboratory scientists were not statistically significant with regard to the revised Hall’s Professionalism Scale (1968) as adapted by Snizek (1972) constructs of professional organizations, self-regulation, calling to the field, and duty to the public. Both groups value their professional organizations, understand their duty to the public, and recognize that their chosen career is self-regulated and members of the profession are dedicated. In addition, early career clinical laboratory scientists believe that people in their profession are “called” to it and they, themselves, have been “called” to it.

Overall, new CLS graduates expressed higher agreement in four of five Hall’s Professionalism Scale (1968) survey constructs than the novice clinical laboratory

scientists. Higher construct scores by the new CLS graduates were found in the constructs that looked at the role of the professional organization, duty to the public, self-regulation, and calling to the field. The higher construct scores may indicate the presence of a theory-practice gap. The newly graduated CLS professionals may not have had enough time in the profession to realize what they do not know about the workplace environment of the laboratory. The only category of questions that novice clinical laboratory scientists had higher overall means than new CLS graduates was autonomy. Novice clinical laboratory scientists have more experience in the laboratory, and would be expected to record higher levels of autonomous behaviors.

In the role of the professional organizations construct, novice clinical laboratory scientists indicated a higher mean in regards to reading the professional journals while the new CLS graduates had higher means for attending professional meetings. The novice clinical laboratory scientists may be using the professional journals as a source for obtaining information about current practices and trends in the field in order to meet the compulsory continuing education requirements to maintain their national board certification. The new CLS graduates may have been required to attend local professional organization meetings as a part of their clinical internship experience.

In the self-regulation of the profession, new CLS graduates had a higher overall mean than the novice clinical laboratory scientists. The new CLS graduates indicated a higher agreement in regards to the statement that examined if CLS was well regulated by itself. The difference in means may once again reflect the presence of a theory-practice gap in early career clinical laboratory scientists. One explanation for the differences in means is the heavy emphasis that formal education programs place on the regulatory

aspects of the CLS profession, which may influence the perceptions of the new CLS graduates' expectation of annual competency requirements.

A second question in the self-regulation construct that had different responses with the novice clinical laboratory scientists indicating a higher level of disagreement was with regard to the CLS profession being overstressed. The lower mean expressed by novice clinical laboratory scientists for this survey item may indicate that the novice clinical laboratory scientists have recognized more than new CLS graduates the poor visibility of the CLS profession because of professional interactions with both the general public, who are having laboratory testing, and interactions in the health care setting with other health care professionals. The poor professional identity of the CLS profession was a finding that was also previously identified by Butina and Schell (2011) and McClure (2008).

In the calling to the field construct, the new CLS graduates had a higher overall mean than the novice clinical laboratory scientists. In particular, the new CLS graduates had higher means in regards to a calling to the field and the dedication of members of CLS. The higher means expressed by new CLS graduates may indicate the presence of a theory-practice gap, as the graduates may have skewed ideals based on limited clinical experiences and classroom learning, which overemphasizes the life-and-death nature of providing accurate laboratory results. To the contrary, the novice clinical laboratory scientists, who still indicated that the members of the profession are called to the field, has had actual real-life experiences that have allowed for the life-and-death nature of the work to become standard practice. The novice clinical laboratory scientists place an

emphasis on the influence of the workplace culture and identified that a decrease in pay would negatively influence the dedication of practicing clinical laboratory scientists.

The study did find, however, that novice clinical laboratory scientists had a higher level of professional autonomy than did the newly graduated CLS professionals. The higher level of autonomy would be expected, as this group of individuals has gained more work experience, and, as such, are more capable of performing tasks without direct supervision. In addition, the novice early career clinical laboratory scientists are often hired to work on evening and night shifts. This off-shift work schedule is typically minimally staffed, which requires the individuals working at these times to be able to independently make accurate decisions on an hour-to-hour basis.

**Sense of belonging.** The new CLS graduate has a higher sense of belonging to the CLS profession than the novice clinical laboratory scientist. The higher sense of belonging expressed by less experienced individuals may be a result of unrealistic or idealistic views of their professional lives. Arthur (1992) found that new nurses often enter the nursing profession with unrealistic career expectations. As the early career clinical laboratory scientists acquire more information about the realities of their day-to-day tasks and career advancement opportunities, and become matriculated into the workplace culture of the laboratory, the sense of the belonging to the profession decreases. Although these novice clinical laboratory scientists still expressed a desire to remain as members of the CLS profession, the dynamics of the work environment are resulting in changes to their previous career plans of remaining in the field in the same position. A previous study by McClure (2008) found that the lack of professional advancement opportunities influenced the retention of clinical laboratory scientists with

5 to 10 years of experience. This result indicates that the CLS profession needs to examine the scope of practice of certified clinical laboratory scientists and adjust the levels of practice of the profession in order to increase the opportunities available to these early career clinical laboratory scientists so that retention is increased. They want and need to be challenged.

**Professional identity.** An unexpected finding in this study was the awareness of the early career clinical laboratory scientists of the challenges that are facing the CLS profession. During the course of this study, the negative aspects of the workplace and laboratory profession were topics participants repeatedly stated as part of the focus group interviews in both groups. While one might expect the novice group to be aware of this, one would not expect the newly graduated to have picked up on this. A study by Gray and Smith (1999) found that the poor attitudes of experienced nurses have been found to influence the professional socialization of early career nurses. This seems to hold true for these early career CLS professionals, as well.

The primary frustration about the CLS profession expressed by study participants was the negative image of the profession that is portrayed by a small group of its members. The early career clinical laboratory scientists readily stated that the negative image of the laboratory starts in the laboratory. These early career clinical laboratory scientists whole-heartedly agreed that these individuals need to change their negative attitudes into positive attitudes. They believe that the positive attitudes will drive change and increase respect for the laboratory profession, both within itself and with other allied health care professionals and the public.



With regard to the public, specifically, the early career clinical laboratory scientists who participated in this study recognized that the role of the clinical laboratory profession as members of the health care team is not well understood. The blurred understanding of the role of the clinical laboratory scientist is frustrating to early career clinical laboratory scientists; they expect the CLS profession and its members to take steps to make others more aware of the CLS profession. This group of CLS professionals takes self-regulation to another level: self-promotion of the profession.

### **Conclusions**

This study has implications for future early career clinical laboratory scientists, clinical laboratory managers, and clinical laboratory science educators.

#### **Early Career Clinical Laboratory Scientists**

Future clinical laboratory scientists need to continue to embrace the profession of clinical laboratory science, but also need to be aware of the theory-practice gap that occurs as early career professionals transition from student to clinical laboratory scientist. Early career clinical laboratory scientists should not be discouraged by the time it takes to navigate through the theory-practice gap.

In order to successfully manage the theory-practice gap, new clinical laboratory scientists need to identify peers and mentors who will help them remain in the CLS profession. The findings of this study contradict a previous study by Beck and Doig (2007), who did not find evidence of the presence of a theory-practice gap with early career clinical laboratory scientists. The format of the Beck and Doig (2007) study, however, may have made it difficult to identify because of the quantitative collection method that was used in that study.

Early career clinical laboratory scientists need to have patience in regards to the professional socialization process. The early career clinical laboratory scientists enter into professional practice in the encounter stage. As the individuals gain experience in the workplace, they will navigate through the adaptation phase and the conflicts that naturally occur as they deal with the existence of a theory-practice gap. More opportunities for advancement will become available in the CLS profession, and the new CLS professionals will progress onward into the commitment stage of professional socialization. Early career CLS professionals must have patience as they navigate from encounter through adaptation to commitment. It takes time and patience.

### **Laboratory Managers**

In order to improve retention of early career clinical laboratory scientists, changes in the laboratory culture need to occur immediately. A change of workplace culture is particularly important because of the anticipated shift in employee demographics as a result of the large number of the workforce that is due to retire. The laboratory manager is the individual who can implement and influence staff to make changes to the present workplace environment.

In order to keep the CLS profession viable and retain talented, early career clinical laboratory scientists, laboratory managers need to implement measures that will improve the morale within the workplace, especially in lieu of the fact that these early career laboratory scientists may have to manage the responsibility of increased workloads caused by the expected reduction in laboratory staff triggered by the predicted retirements. Increased workload and the resulting stress have been associated with

decreased retention of laboratory personnel in previous studies (Lunz, Harmening, & Castleberry, 1998).

This study found that early career clinical laboratory scientists identified that more experienced professionals need to improve their attitudes towards the CLS profession. This group of professionals believes that the negative attitudes expressed by more experienced clinical laboratory scientists influenced not only the early career clinical laboratory scientists but also the external image of the role of the laboratory in health care. Bragg (1976) identified that the professional socialization process involved the incorporation of not only personal but also “group values and norms” (p. 14). The importance of a positive work environment was also supported by the findings of Levett-Jones and Lathlean (2007), who found that a positive work environment enhanced the formation of new nurses’ sense of belonging to the nursing profession. If the laboratory does not positively improve workplace culture, then the early career clinical laboratory scientists may adopt the same negative perspective, thus perpetuating the problem for another generation of CLS professionals.

A second change that is needed to improve the retention of early career clinical laboratory scientists is the incorporation of mentorship at the time of initial hire of new graduates. Utilization of a mentorship program may assist early career clinical laboratory scientists in their successful transition into the laboratory workforce. As a result of these positive mentorship experiences, early career clinical laboratory scientists may choose to remain in the field and in their current positions instead of leaving the field for other laboratory settings or related professions. The nursing profession has adopted a model of mentorship as new graduates enter the workforce. Schipper (2011) found that an

implementation of a year-long mentorship program for new graduates improved retention rates and the morale of new hires in nursing. If clinical laboratories adopt a similar program of mentorship for new hires, this mentorship program needs to begin at the time of hire. Laboratory managers should not consider the mentorship that naturally exists as a part of the clinical laboratory science internship practicums sufficient mentorship. It should start at the time of hire. The only study addressing mentorship in the clinical laboratory science literature examined the role of mentorship of new CLS faculty teaching (Beck & Laudicina, 2001) at the university level. Beck and Laudicina (2001) found that if new CLS faculty had a mentor there was an increased likelihood of successful transition into academia. This sort of mentorship is needed even more within the CLS profession itself.

Lastly, laboratory managers need to be aware of the professional socialization process and how progression through the stages influences the retention of clinical laboratory scientists. If laboratory managers are able to support and encourage the progression through the different phases of professional socialization, then retention of early career clinical laboratory scientists will improve. Other allied health professions have studied the professional socialization process as a way to improve retention of early career professionals and have indicated that it does improve retention (Hatoum & Smith, 1987; Mooney, 2007; Pitney et al., 2002). There is evidence to suggest that this will hold true for CLS as well.

### **Clinical Laboratory Science Educators**

Diana Mass, who was interviewed by Castleberry and Rolen-Mark (2000), was asked to identify a failure of the current CLS curriculum. She stated that the sole failure

of the CLS system is a lack of professional socialization (p. 491). The assumption that professional socialization occurs only during the formal education of an individual is inaccurate, as other professional socialization conceptual frameworks do not support this argument (e.g., Miller, 2010, and Rosch & Reich, 1996). The process of professional socialization may begin when an individual is a student but the process continues throughout the entire career. As such, clinical laboratory science educators are only the first step in the professional socialization process.

One way clinical laboratory science educators can improve the professional socialization process is by being positive student role models. In addition, the faculty acknowledgment of the presence of a theory-practice gap in the CLS profession will also help alleviate that “reality shock” students should expect to experience. By acknowledging that a theory-practice gap exists, new collaborations between accredited CLS programs and clinical laboratories may work to support students and early career CLS professionals’ successful movement through the theory-practice gap and increase the retention of new clinical laboratory science graduates. The gap exists; CLS educators must acknowledge the gap and better prepare their students for dealing with it and working through it.

### **Limitations**

This study was conducted using a convenience sample from a single clinical laboratory science program, which may have limited the generalizability of the study. The electronic format of the quantitative survey and focus groups may have discouraged responses from eligible participants. Lastly, the design of this study may have discouraged participation.

## **Future Research**

In order to provide an in-depth explanation of professional socialization, studies need to be conducted that identify professional attributes and sense of belonging of clinical laboratory scientists with different levels of work experience. Future research should utilize quantitative surveys, qualitative focus groups, individual interviews, and mixed method designs. In order to enhance generalizability, future studies of early career clinical laboratory scientists need to be conducted using graduates from other clinical laboratory science programs. Future large-scale studies would also need to be conducted to collect a larger sample size than the present study in order to identify if the difference in means that were found in this study between the new CLS graduates and the novice clinical laboratory scientists is more significant than this study found. Other work experience categories that can and should be studied include:

1. Students in other accredited clinical laboratory science programs;
2. CLS professionals with 3-10 years of work experience;
3. CLS professionals with 10 or more years of experience;
4. CLS professionals who have left the profession for a different career;
5. CLS professionals who have retired from the profession.

This study utilized a single administration of the Hall's Professionalism Scale (1968) as adapted by Snizek (1972) and qualitative focus group interviews. In order to further explain the attributes and experiences that influence the professional socialization process of early career clinical laboratory scientists, a longitudinal study of a single cohort of students could utilize a repeated measurement and analysis of the Hall's

Professionalism Scale, focus groups and individual interviews of cohort members during the first three years of practice in the clinical laboratory science profession, and beyond.

### **Final Thoughts**

This study identified the professional attributes, sense of belonging, and professional socialization process of early career clinical laboratory scientists. If the members of the CLS profession do not change the dynamics of the laboratory, the decreased retention of early career clinical laboratory scientists will continue. Poor retention of early career clinical laboratory scientists is not a new issue facing the profession, but rather it is a long-term problem that the profession has failed to address.

CLS educators are challenged to annually produce as many highly qualified professionals as possible. Producing more CLS graduates will not decrease the workforce shortage entirely, but it will help if it is paired with the CLS profession identifying and implementing successful strategies to retain new graduates as they make the transition from students to experienced clinical laboratory scientists. An in-depth analysis of the professional socialization of clinical laboratory scientists is key to successful retention.

## **APPENDICES**



## Appendix A

### Hall's Professionalism Scale (1968) as Adapted by Snizek (1972)

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#### Professional socialization in students and practitioners of clinical laboratory science.

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Please answer the following questions. All responses are confidential and will not be identified to individual students.

Once you have completed the survey please choose the submit survey option at the end of the survey. The survey will be electronically sent for data analysis. If you encounter difficulties on submission, the survey may be emailed to [karen.peterson@med.und.edu](mailto:karen.peterson@med.und.edu), submitted via fax to (701) 777-2404 or submitted via US Mail. Mailing address is: Karen Peterson UND Dept of Pathology; Mail Stop 9037 501 N. Columbia Road; Grand Forks, ND 58202-9037. Karen is collecting all surveys prior to analysis to ensure non-identification of survey responses.

Thank you for your time used to complete this survey. If you have any questions about this instrument please feel free to contact me directly at [janna.schill@med.und.edu](mailto:janna.schill@med.und.edu) or contact me via phone at (701) 777-6302

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<p>Select your answer that best describes your demographics.</p>	
<p>Gender</p> <p><input type="checkbox"/> Male</p> <p><input type="checkbox"/> Female</p> <p>Age</p> <p><input type="checkbox"/> &lt; 25</p> <p><input type="checkbox"/> 25-40</p> <p><input type="checkbox"/> &gt; 40 Yrs</p> <p>Please select if you are a member of any or all of the following professional organizations.</p> <p><input type="checkbox"/> American Society of Clinical Pathology</p> <p><input type="checkbox"/> American Society for Clinical Laboratory Science</p> <p><input type="checkbox"/> Other related field.</p> <p>Please state the organization _____.</p>	<p>Please select your route of study in the UND Clinical Laboratory Science Program.</p> <p><input type="checkbox"/> WCACLS</p> <p><input type="checkbox"/> UND 2+2 program of study</p> <p><input type="checkbox"/> UND 4+1 program of study</p> <p>Please select your current program status.</p> <p><input type="checkbox"/> CLS Professional Year 2 (currently completing clinical practicum experience)</p> <p><input type="checkbox"/> Recent CLS Program graduate (completed Degree/certificate in 2010 or 2009)</p> <p>Do you plan on apply to a professional school in another similar area of study (i.e. pre-Medicine, pre-Physician Assistant, etc.)</p> <p><input type="checkbox"/> Yes</p> <p style="padding-left: 20px;">If yes, what are of study to you plan to pursue? _____</p> <p><input type="checkbox"/> No</p>

Hall's Professionalism Scale (1968) as Adapted by Snizek (1972)

The following questions are measure certain aspects of what is commonly defined as "professionalism" All of these questions reference your clinical laboratory science as your particular profession. Each item then, should be answered in light of the way you yourself both feel and behave as a clinical laboratory scientist professional.		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1.	I systematically read the professional journals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Other professions are actually more vital to society than mine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	I make my own decisions in regard to what is to be done in my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	I attend professional meetings at the local level.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	I think that my profession, more than any other, is essential for society.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	My fellow professionals have a pretty good idea about each other's competence.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	People in this profession have a real "calling" for their work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	The importance of my profession is sometimes overstressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	The dedication of people in this field is most gratifying.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	I don't have much opportunity to exercise my own judgment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11	I believe that professional organizations should be supported.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	Some other occupations are actually more important to society than is mine.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13	A problem in this profession is that no one really knows what his colleagues are doing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14	It is encouraging to see the high level of idealism which is maintained by people in this field.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15	The professional organization doesn't really do too much for the average member.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16	We really have no way of judging each other's competence.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17	Although I would like to, I really don't read professional journals too often.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18	Most people would stay in the profession even if their incomes were reduced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19	My own decisions are subject to review.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20	I am my own boss in almost every work-related situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21	There is not much opportunity to judge how another person does his work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22	If ever an occupation is indispensable, it is this one.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23	My colleagues pretty well know how well we all do in our work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24	There are very few people who don't really believe in their work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25	Most of my decisions are reviewed by other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

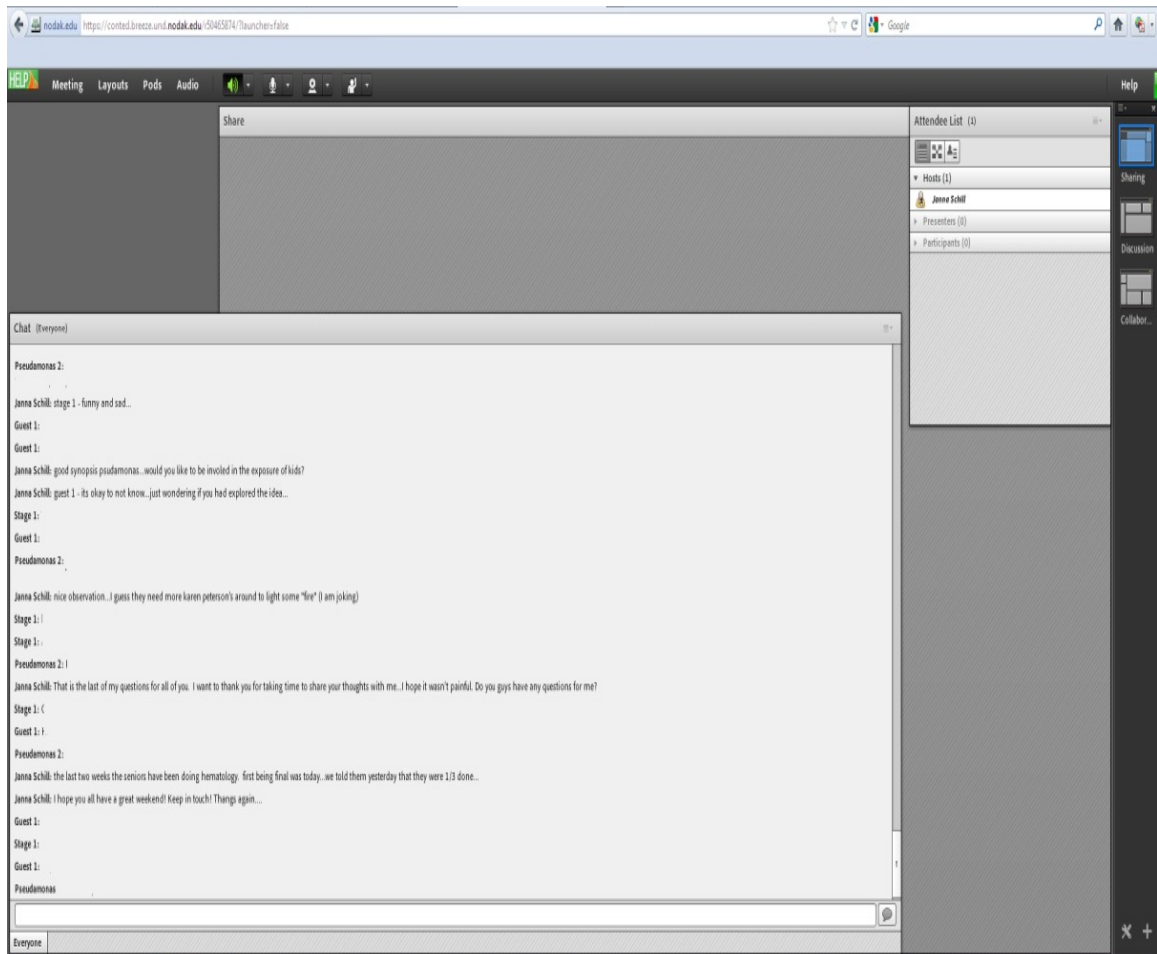
## **Appendix B**

### **Outline Used for Focus Group and Image of Online Chat Room**

#### Professional Socialization Focus Group Question Outline

1. Discovery of clinical laboratory science as a career path
  - a. How did you discover?
  - b. When did you discover?
  - c. What were your other possible career paths?
  - d. What drew you to clinical laboratory science?
2. Preparation for clinical experience
  - a. Did you feel prepared? Why or why not?
  - b. Were you able to complete tasks independently? Give examples.
  - c. Do you feel you are a contributing member in the medical laboratory during the clinical experience?
  - d. Were there ways to improve the clinical experience? Give examples?
  - e. What were the strengths and weaknesses of your clinical rotation?
3. Future career plans
  - a. What size facility do you plan to seek employment as a clinical laboratory scientist? Is this a similar or same facility that you completed your clinical experience?
  - b. How long do you plan on remaining at your clinical experience?
  - c. If you have already earned entry level employment, how long is your proposed training experience in length?
  - d. What areas of the clinical laboratory do you wish to work?
  - e. Do you plan on achieving further education? If so, in what area of study?
  - f. Are you a member of a laboratory professional organization? If so, which organization and why did you choose that organization?
  - g. Do you feel prepared to be an independent clinical laboratory scientist? Why or why not?
  - h. What role does clinical laboratory science play as a member of the health care team? What ways would you like this role to change?

Screen shot image of online focus group chat interface. The screen shot contains an image of an actual chat session. The responses of the participants that were on the original screen shot have been removed but the aliases chosen by each participant remain.



## **Appendix C**

### **Electronic Request to Complete Surveys**

-----Original Message-----

From: Schill, Janna  
Sent: Tuesday, May 10, 2011 11:30 AM  
To: Peterson, Karen  
Subject: Survey

Hello all,

Please take a few minutes to complete this survey professional socialization of clinical laboratory science. This survey is a part of my dissertation and I appreciate you completing honestly.

A second piece of this survey is that I will be conducting a minimum of one focus group that will be completed in an online, anonymous format. I will need approximately 10-15 participants.

The online focus group will be completed on Monday May 16 at 7:30 PM CDT and if needed a second group will be conducted May 18 at 7:30 CDT. Please let Karen know if you would like to participate in the focus group.

Thanks

Janna Schill

## **Appendix D**

### **Focus Group Private Chat Directions**

**From:** Schill, Janna  
**Sent:** Monday, May 16, 2011 9:15 AM  
**To:**  
**Subject:** Link for Focus Group Session

Attached you will find the link for the focus group that will occur at 7:30 CDT on Monday May 16th. If anyone feels that they can attend at that time it would be much appreciated.

If you would like to participate in this session, but the time does not work for you, please email Karen and we can do another time in the online format. I am willing to work on a schedule that works for all of you!

Click on this link to enter into the room:

<https://conted.breeze.und.nodak.edu/r50465874/>

When you click on the link you will be asked to enter your name. Please do not use your name...you can use things such as E.coli, or Guest 1, etc...

In the lower left hand window you will see a chat window. In the chat window, is where the questions will be asked and everyone will be able to respond. It may take a little time to get used to the process but I know that everyone will do amazing.

Thanks for everything!

Janna Schill

## Appendix E Institutional Review Board Research Approval

UNIVERSITY OF  NORTH DAKOTA

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INSTITUTIONAL REVIEW BOARD  
c/o RESEARCH DEVELOPMENT AND COMPLIANCE  
DIVISION OF RESEARCH  
TWAMLEY HALL ROOM 106  
264 CENTENNIAL DRIVE STOP 7134  
GRAND FORKS ND 58202-7134  
(701) 777-4279  
FAX (701) 777-6708  
[www.und.edu/dept/rdc/regucomm/IRB](http://www.und.edu/dept/rdc/regucomm/IRB)

May 4, 2011

Janna Schill  
Pathology Dept.  
Stop 9037

Dear Ms. Schill:

We are pleased to inform you that your project titled, "Professional Socialization in Clinical Laboratory Science" (IRB-201105-321) has been reviewed and approved by the University of North Dakota Institutional Review Board (IRB). The expiration date of this approval is September 15, 2012.

As principal investigator for a study involving human participants, you assume certain responsibilities to the University of North Dakota and the UND IRB. Specifically, any adverse events or departures from the protocol that occur must be reported to the IRB immediately. It is your obligation to inform the IRB in writing if you would like to change aspects of your approved project, prior to implementing such changes.

When your research, including data analysis, is completed, you must submit a Research Project Termination form to the IRB office so your file can be closed. A Termination Form has been enclosed and is also available on the IRB website.

If you have any questions or concerns, please feel free to call me at (701) 777-4279 or e-mail [michelle.bowles@research.und.edu](mailto:michelle.bowles@research.und.edu).

Sincerely,



Michelle L. Bowles, M.P.A., CIP  
IRB Coordinator

MLB/jje

Enclosures

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