

INSTRUMENT DEVELOPMENT AND PSYCHOMETRIC TESTING OF THE  
CAPSTONE-EXPERIENCE PRECEPTOR PREPAREDNESS  
SCALE: THE CAP-EXPRESS STUDY

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ABSTRACT

**Purpose**

Preceptors are relied upon to prepare nursing students during their capstone experience as novice, generalist nurses. There is currently no instrument that measures the preceptor's level of preparedness. The purpose of this study was to psychometrically test a 67-item instrument, the Cap-ExPresS developed during a pilot study, which evaluated the level of self-perceived confidence preceptors reported when working with capstone students.

**Methods**

The subject population was clinical nurses working as preceptors for senior-level nursing students during their capstone experience. The sample included 118 preceptors recruited from four hospitals in the Midwest. A cross-sectional multi-center survey design was used to test the instrument for internal consistency reliability and test-retest reliability. Exploratory factor analysis (EFA) was also performed to support construct validity. Correlations and regressions between independent variables and Cap-ExPresS scores measuring preceptor preparedness were explored. This study tested a revised 67-item Cap-ExPresS with this larger more diverse sample, decreasing the scale to 22 items representing preceptor

preparedness with subscales of Student-Centeredness, Pedagogic Competence, Clinical Competence, and Nurse Professionalism.

### **Procedure**

After IRB approval, hospital contacts forwarded email instructions with a survey link to all their clinical nurses. The survey screened for inclusion: registered nurses providing direct patient care who had precepted or planned to precept a capstone student. Data were collected securely using Research Electronic Data Capture. After EFA and item analyses, participants were invited to take the retest, evaluating test-retest reliability.

### **Future Research**

A valid and reliable Cap-ExPresS can be used to identify learning needs of the preceptor, to perform interventional studies, longitudinal studies, and randomized controlled trials. The goal is to identify best practices and increase preceptor's self-perceived level of preparedness to precept capstone students.

## APPROVAL PAGE

The faculty listed below, appointed by the Dean of the College of Nursing and Health Studies have examined a dissertation titled “Instrument Development and Psychometric Testing of the Capstone-Experience Preceptor Preparedness Scale: The Cap-ExPresS Study,” presented by Lisa Eyring Guthrie, candidate for the Doctor of Philosophy degree, and certify that in their opinion it is worthy of acceptance.

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# CHAPTER 1

## INTRODUCTION

The preceptor is an integral part of baccalaureate nursing student education (American Association of Colleges of Nursing [AACN], 2008; Kalischuk et al., 2013; Myrick, 1991) yet there are no standards by which the preceptor's preparedness can be measured. The AACN (2008), an accrediting body for baccalaureate of science in nursing (BSN) programs, includes the expectation of an immersion experience with a preceptor within their curriculum guidelines. The preceptor, an experienced clinical nurse, is first an employee expected to provide safe and effective patient care. Secondly, this nurse may become a preceptor assigned the additional responsibility of precepting a nursing student and preparing that student to be a novice, generalist nurse (AACN, 2008). An immersion experience, or capstone, is a final clinical experience where the senior-level nursing student is assigned to a preceptor within the clinical environment and is expected to integrate nursing theory into nursing practice. The preceptor is a role model and a resource for the student in applying theoretical knowledge to practice, and in using reflection, critical thinking, and problem solving to guide patient care decisions (Carlson, 2012; Shinnors & Franqueiro, 2017; Yonge et al., 2007). The preceptor role includes passing to the preceptee the skills, attitudes, and behaviors expected of a nurse within the random, complex, and unpredictable clinical learning environment (Carlson, 2012; Limón et al., 1981; Yonge et al., 2007).

### **Significance**

The preceptor model was established in the 1970s as a means of protecting newly graduated nurses from reality shock, a term developed to encompass the inability of the new nurse to adjust to the realities of nursing (Kramer, 1975). Then in the 1980s the preceptor

model was adopted by nursing curricula to mitigate the faculty shortage, as an alternative to faculty-led clinical training during the immersion experience (AACN, 2019). The preceptor model has since become established as a fiscally responsible (Institute of Medicine, 2011) and preferred educational model for clinical training in most BSN programs particularly (AACN, 2020).

The number of nursing students currently entering nursing education programs will fall short of filling the 1.09 million nurse job openings predicted by 2024 (AACN, 2019). As colleges and universities work to increase enrollment to meet the nursing demand, the need for preceptors also will continue to grow. Looking at graduate nurse pass-rate statistics from 2019, the National Council of State Boards of Nursing (NCSBN, 2020) reported 79,235 BSN students passed the National Council Licensure Exam (NCLEX). These numbers demonstrate the continued and growing need for preceptors who complete the clinical education of nursing students during their capstone or immersion experience (AACN, 2008).

While the expectation by schools of nursing is for preceptors to be an integral part of their senior-level nursing student's education, the concept of the preceptor is not clearly described, nor are there standard expectations of preceptor preparedness presented in the literature (L'Ecuyer et al., 2018; Windey et al., 2015). A lack of standardization in the knowledge, skills, and attitudes of preceptors equates to a lack of consistency in the quality of education nursing students receive. This in turn decreases the quality of preparation of newly graduated nurses, thereby negatively impacting the quality of the patient care they ultimately provide. A sentinel study by Berkow et al. (2009) highlighted disparities in perceptions of the preparedness of newly graduated nurses as perceived by academic leaders

and clinical practice leaders. This study reported only 10% of clinical leaders felt newly graduated nurses were prepared to provide safe, effective patient care while 90% of the academic leaders reported that the newly graduated nurses were prepared to provide safe, effective patient care. Upon closer review, areas of difference indicated a focus on different competencies; clinical leaders focused on deficits in communication and critical thinking skills while the academic leaders highlighted successful performance of competencies in practical nursing skills (Berkow et al., 2009). These differing viewpoints of recently graduated nurse's preparedness leads to ambiguity regarding what students need to learn and be able to apply and thus what preceptors need to be prepared to teach and role model. When considering the complexities of the preceptor role, including competing expectations from employers and faculty, it is not surprising preceptors feel unprepared for the capstone preceptor role. This further supports the need for standardization of preceptor education to support consistency in the preparation of nursing students as novice, generalist nurses. In addition, a call for standardization of outcomes highlights the need for valid and reliable measurement. The development of instruments measuring standard expectations of the preceptor supports the growth of nursing science related to preceptor preparedness.

In the United States, preceptors of nursing students are regulated by the State Boards of Nursing. Thus, preceptor requirements vary between states (L'Ecuyer et al., 2018). For example, within the Midwest, Missouri requires one year of registered nursing (RN) experience within an area of specialty to become a preceptor while Kansas does not designate any required level of RN experience in order to be a preceptor, and Indiana requires three years of RN experience. While experience as a RN would tend to indicate clinical competence to practice nursing, length of time as an RN does not guarantee competence in

the preceptor role (Cangelosi et al., 2009). Furthermore, state regulations do not provide a clear understanding of the necessary skills, attitudes, or knowledge expected or even recommended for the preceptor role (L'Ecuyer et al., 2018).

While it was initially thought clinical nurses could intuitively add precepting skills to their RN role (Shamian & Inhaber, 1985), criticisms soon arose regarding the need for preceptors to have additional competencies in teaching principles like those of academic clinical faculty (Myrick, 1991). It was found that even expert clinical nurses lacked confidence when beginning in the preceptor role (Benner, 1982; Miller et al., 2016). Education provided for preceptors has consistently been measured by rating satisfaction with the content or the delivery methods (Horton et al., 2012; Boyer, 2002; Limón et al., 1981; Senyk & Staffileno, 2017; Thomas et al., 2018; Windey et al., 2015). This type of measurement merely established that most preceptors felt satisfied regardless of the content or delivery method of their education. Yet many preceptors continued to question their preparedness for the preceptor role (Alspach, 2008; Dibert & Goldenberg, 1997; McClure & Black, 2012; Myrick, 1991; Omansky, 2010; Quek & Shorey, 2018; Smith & Sweet, 2019), thereby generating the need to measure the construct of preceptor preparedness from the preceptor's perspective.

### **Conclusion**

Preceptors are necessary to support and educate nursing students during their clinical experiences, particularly during their capstone experience as they prepare to transition to the role of a novice, generalist nurse. According to Horton et al. (2012), "...effective preceptors socialize, protect, educate, and evaluate" (p. E1) preceptees, and they do this while caring for

patients within a complex, unpredictable, and often chaotic clinical environment (Carlson, 2012; Limón et al., 1981). The complexity of the preceptor role continues to expand in the current healthcare environment. Healthcare reform, an increasing regulatory presence, increasing diversity in points of patient contact, expanding medical knowledge, restructuring of healthcare organizations, and more complex ethical and legal considerations all increase the complexity of healthcare, which accentuates the importance of the preceptor role in preparing nursing students for practice. Even recognizing the importance of the preceptor, Quek and Shorey (2018) argued the preparation of preceptors did not receive the attention the role deserved.

With newly graduated nurses being the largest resource for filling open nursing positions (Condrey, 2015), the demand for prepared preceptors of nursing students is expanding in kind, yet there is not a consensus of standard expectations for this preceptor role (Windey et al., 2015). This lack of standardization has led to role ambiguity with inconsistencies across states and institutions regarding the expectations for selection (Cotter et al., 2018), preparation, and retention of preceptors. Such issues have been prolonged by a lack of validated tools measuring the preparation of preceptors who work closely with of capstone nursing students (Billay & Myrick, 2008; Windey et al., 2015). The need for an instrument that measures preceptor preparedness to work with capstone students is clear. This study will evaluate preceptor preparedness and develop an instrument that can be used to measure a preceptor's perception of their own preparedness, thus providing standardization of expectations.

## CHAPTER 2

### REVIEW OF LITERATURE

The imperative for academic institutions to prepare graduating nurses for practice intensifies with the increasing complexities seen in healthcare (Berkow et al., 2008; Forber et al., 2016; Windey et al., 2015; Zawaduk et al., 2014). While preceptors are incorporated throughout the nursing clinical experience curriculum, use of the preceptorship model has become the method of choice for the final clinical experience in BSN education (AACN, 2008; Carlson, 2012; McClure & Black, 2012). Within this model, the preceptor is an experienced clinical nurse (Carlson, 2012; Limón et al., 1981; Shamian & Inhaber, 1985; Shinnars & Franqueiro, 2017; Yonge et al., 2007) providing individualized education to senior-level undergraduate nursing students within the normal work of patient care (Luhanga et al., 2010; Shinnars & Franqueiro, 2017; Yonge et al., 2007). For this study, a preceptorship is defined as the time-limited collaboration between a preceptor, student, and faculty member which facilitates the application of knowledge to real-life experiences within the clinical learning environment [CLE] (McClure & Black, 2012; Myrick et al., 2012; Omansky, 2010; Windey, et al., 2015; Yonge et al., 2007; Zawaduk et al., 2014). This collaboration, or relationship is set for a specific period of time and is supported by a formalized agreement between the school and the CLE.

The CLE is defined as the physical setting, the organizational culture, and the people that collectively comprise the situation for student learning (preceptor, student, faculty, other staff), and where theoretical knowledge is applied (Flott & Linden, 2015; Forber et al., 2016). Unlike the classroom environment, which is typically structured and controlled, the learning opportunities within the CLE are often random and unpredictable, further

challenging the preceptor in aligning learning goals with daily work. The preceptor is tasked with keeping the CLE safe and productive for student learning while, at the same time, providing safe patient care (Flott & Linden, 2015; Limón et al., 1981).

### **Historical Background**

Letizia and Jennrich (1998) traced the history of nursing preceptorships to the 1960's. The term *preceptorship* was first included in the International Nursing Index in 1975 (Shamian & Inhaber, 1985). Preceptorships were successfully implemented within the advanced practice curriculum as described by Helmuth and Guberski (1980), successfully transferring the education of advanced practice nurses from medicine to nursing. In the 1970's, preceptors began supporting newly graduated nurses as they integrated into the workforce (Shamian & Inhaber, 1985). The one-to-one aspect of the preceptorship model was considered ideal for guiding newly graduated nurses to apply theory to practice (Luhanga et al., 2010; Shamian & Inhaber, 1985) and to reduce the impact of reality shock (Kramer, 1980), which often led to the inability to transition successfully into the nurse role.

The faculty shortage of the 1980s found the use of preceptors migrating into the senior nursing student immersive clinical capstone experience. Shamian and Inhaber (1985) asserted preceptors could easily modify their teaching strategies based on the students' needs and provide a stress-free environment for student learning; the use of preceptors was considered an effective method of providing clinical education (Greene, 2010; Greene et al., 2009; Lee et al., 2009; Shamian & Inhaber, 1985). However, Myrick (1991) disputed the use of preceptors as clinical educators for nursing students because they had not received adequate education for the instructor role, education like that of nursing faculty. Jumping ahead, the Institute of Medicine reinforced in their 2011 *Future of Nursing* report that the

preceptorship model was a viable means of combatting the faculty shortage in nursing. In their 2008 baccalaureate essentials, the AACN established the inclusion of an immersion experience with a preceptor during the BSN student's final preparation as a novice, generalist nurse. The 2020 revisions to the BSN essentials continue to include the preceptor as an integral part of nursing education programs offering a broader definition of immersion experiences as the nurse's role expands across the continuum of care (AACN, 2019c)

Dibert and Goldenberg (1997) conducted a qualitative study asking preceptors about the benefits, rewards, supports, and commitment related to their preceptor role and found that preceptors wanted more training and support from their organization, manager, and nursing schools. This landmark study led to multiple replication and splinter studies supporting these results both within the U.S. and internationally (Chang et al., 2013; Hyrkas & Shoemaker, 2007; Kalischuk et al., 2013; Kennedy, 2019; Madhavanpraphakaran et al., 2014; Moran, 2005; Usher et al., 1999).

The preceptor particular to the nursing student has not always been included in preceptor research. A descriptive study by Kennedy (2019) recruited a national sample of preceptors ( $N = 88$ ) of new graduate nurses and evaluated the differences between preceptors with and without formal preceptor education, and their perceptions of rewards, benefits, supports, and commitment to the preceptor role. The researchers reported that preceptors were committed to the role but wanted more education focused on their growth and development. Kennedy (2019) recognized the lack of preceptors of nursing students in the sample limited the results, as preceptors of nursing students may have different perceptions regarding rewards, benefits, supports, and commitment to the role than nurses who precepted newly graduated nurses.

A wide range of methods has been developed to prepare and support preceptors, from printed materials and workshops to structured programs such as dedicated education units and residency programs. Myrick and Yonge (2005) published a handbook focused on supporting the role of the preceptor in connecting theory to practice. A precepting handbook by Ulrich (2018) provides both theoretical and practical guidance to promote preceptor success through processes of preceptor training and selection, and the development of learning plans for preceptees: nurses new to the role and nursing students. Boyer (2002) implemented a dedicated education unit (DEU); an alternative model of clinical education that includes preceptors to educate nursing students at all levels with involvement of faculty in providing daily feedback and support for both the preceptor and the student (Boyer, 2002; Jones et al., 2017). Horton et al. (2012) implemented a full-day preceptor-training workshop funded by the Missouri Department of Labor, a collaborative effort of clinical and education partners to prepare preceptors for their role. Versant (2019) provides a web-based residency program that organizations can purchase with built-in training and support for preceptors of new graduate nurses. The importance of preceptor development has been the focus of many organizations and nurse scholars leading to methods with varying levels of cost and involvement. Results from this study may help guide training as preceptors identify behaviors for which they lack confidence to perform.

McClure and Black's (2012) integrative review recommended continued research in preceptor preparation, especially due to the ever-changing clinical environment. Windey et al., (2015) aimed to identify best practices in their systematic review of 12 studies of interventions for preceptor development. Yet the key findings indicated a lack of evidence to support best practices due to the paucity of measurement tools available, faulty research

designs, minimal outcomes research, and low-level evaluation methodologies within nurse preceptor research. Forber et al.'s (2016) review aimed to identify an optimal model of student supervision within clinical education. Successful synthesis of the results was again restricted by the nature of the studies summarized as a lack of consistently defining terms, variations in research methods, and lack of generalizability of samples. While literature demonstrated interest in studying preceptors, the development of preceptor preparation best practices has not been established due in part to a lack of strong research methods, standardization of preceptor expectations, and of contextually appropriate, psychometrically tested instruments. This current instrument development study has further developed the construct of preceptor preparedness leading to clearer standards and expectations for preceptors within the context of working with nursing students in their capstone experience. This study offers a psychometrically tested instrument measuring preceptor preparedness according to these standard expectations for teaching capstone students.

### **From Preceptor to Preceptor Preparedness**

A concept analysis of the term preceptor was completed to clarify the language being used to describe the preceptor and to identify the range of attributes used in its description. The attributes were identified then clustered into themes as will be described. Preceptor preparedness was built around the preceptor concept using Bandura's (1997) self-efficacy theory (SET) as a framework. The concept is considered the ideal, while preceptor preparedness is a representation of the preceptor concept and how it is actualized within the capstone experience. The Capstone-Experience Preceptor Preparedness Scale (Cap-ExPresS) measures the level of confidence the preceptor perceives they have for performing the precepting behaviors described by each item in the scale. This study uses SET as a

framework to show relationships between the various aspects of preceptor preparedness. The rating of the preceptor's self-perceived confidence in performing each item allows one to 'see' and thus measure the latent variable of preceptor preparedness, representative of the standard expectations established for the knowledge, skills, and attitudes needed for preceptor preparedness. What follows is a concept analysis of the preceptor, specifically one working with capstone nursing students. From the analysis of the preceptor comes the definition of preceptor preparedness.

### **The Preceptor Operationalized**

The concept of the preceptor is complex. An analysis of *preceptor* was initiated to minimize the ambiguity of the preceptor concept, a barrier to measuring preceptor performance and guiding preceptor selection, training, and development. The term *preceptor* was defined as "one that guides nursing students to apply classroom knowledge in the clinical setting, functions as a role model, teaches clinical skills, and models critical thinking" (McClure & Black, 2012, p. 336). Surrogate terms, or terms used interchangeably with the term of preceptor, included mentor (Li & Su, 2014; Stewart, 1996; Tuomikoski et al., 2018), clinical instructor (Nottingham, 2015), clinical supervisor (Smedley et al., 2010), clinical teacher (Fluit et al., 2010; Li & Su, 2014), and tutor (Rodríguez-García et al., 2018; Shamian & Inhaber, 1985).

Preceptorship was a term used interchangeably with preceptor. Ward and McComb (2018) clarified the concept of preceptorship, defining preceptorship as a *process* within which a preceptor functions. The preceptorship was defined as a one-to-one relationship within a formalized program, for a predetermined amount of time, to systematically support practical, clinical experiences (Ward & McComb, 2018). This clarity separates the concept of

preceptorship as unique from preceptor, allowing successful implementation of both (Yonge et al., 2007). Billay and Myrick (2008), in their multidisciplinary integrative review of preceptorships, identified the preceptor as one of three participants within the preceptorship: student, preceptor, and faculty. The concept of preceptor for this study is specific to the nursing education preceptorship domain, specifically the nursing student capstone experience and preparing these students for practice as novice, generalist nurses.

To have a preceptor, there must be a preceptorship established (Ward & McComb, 2018). In nursing education, the preceptorship relies upon an agreement between a school of nursing and the clinical site determining the length of the experience, the number and kind of student assignments (Flott & Linden, 2015; Madhavanpraphakaran, et al., 2014), and the practical expectations of the preceptors (ie. objectives, evaluative requirements, contact information for faculty). The clinical nurse acting as preceptor is an employee of the clinical site and not of the school (Hugo et al., 2018; Omer et al., 2015; Tuomikoski et al., 2018). There must be patients within a CLE (Hosoda, 2006; Li & Su, 2014; Nottingham, 2015; Shamian & Inhaber, 1985) and a nursing student with basic theoretical knowledge (Flott & Linden, 2015) as antecedents to a capstone experience with a preceptor.

Mentor was another surrogate term seen used in Taiwan (Li & Su, 2014) and Finland (Tuomikoski et al., 2018). In these studies, the mentor was actually functioning according to the definition of a preceptor. While there are similarities between mentor and preceptor, such as being a one-to-one relationship, Yonge et al. (2007) described the importance of using terms correctly to promote their study within the scientific literature. The concept analysis of mentorship by Stewart and Krueger (1996) defined the mentorship as a relationship focusing on career development, being reciprocal in nature, and lasting for an indeterminate length of

time. In contrast, the preceptor relationship was a relationship focused on preparing the preceptee/nursing student for their new role of novice, generalist nurse (AACN, 2008), was more unidirectional in supporting and training the student, and was set for a pre-established length of time. While preceptors describe intrinsic benefits from the preceptor relationship, it is not a goal for the student to teach the preceptor.

### **Attributes**

Attributes are expressions of elements which are common in the use of a concept. The concept of the preceptor has been described by roles and responsibilities or the skills required to be a preceptor (Windey et al., 2015). Each has an important part to play in the attributes of the preceptor and the development of preceptor preparedness. The attributes of the preceptor recognized within the literature were synthesized into clusters with common themes, resulting in four attributes: (a) Student-Centeredness, (b) Pedagogic Competence, (c) Clinical Competence, and (d) Nurse Professionalism. These four attributes were also considered the four dimensions of self-perceived preceptor preparedness.

### ***Student-Centeredness***

For this attribute of the preceptor, there were multiple references to a characteristic mindset exemplified in behaviors. These included a positive attitude when working with students, conferring confidence in the student, and helping students feel a part of the care team (Cotter, et al., 2018; Hugo et al., 2006; Nottingham, 2015; Smedley et al., 2010; Tuomikoski et al., 2018). Studies suggested increased self-efficacy could lead to improved preceptor attitudes (Li & Su, 2014; Rebholz & Baumgartner, 2015; Smedley et al., 2010). Li and Su (2014) studied  $N=116$  nurses in Taiwan, exploring the association between personality traits (ie. extroversion) and the teaching self-efficacy of preceptors. The

participant nurses had at least three years of practice experience, but only 36.2 % had formal preceptor training. Results indicated extroversion was significantly associated with increased teaching self-efficacy, emotional maturity, and professional skill. Rebholz and Baumgartner (2015) interviewed 19 hospital-based preceptors and identified the importance of emotion to learning as seen in having a sense of humor; being patient, kind, and non-judgmental; having empathy for the fear and uncertainty learners experience; and an overall positive attitude. Highlighting the importance of positive emotion to learning, these preceptors warned that rude or impatient nurses should not be preceptors. A preceptor was also expected to adjust teaching techniques based on student needs (Li & Su, 2014; Martensson et al., 2016; Shamian & Inhaber, 1985), to socialize the student to the clinical environment (Golightly et al., 2017; Omer et al., 2016; Smedley et al., 2010) and create a safe, supportive learning environment for the student (Bengtsson & Carlson, 2015; Burbach et al., 2016; Chen et al., 2015; Cotter et al., 2018; Flott & Linden, 2015; Hosoda, 2006; Rodríguez-García et al., 2018; Omer et al., 2016).

According to Flott and Linden's (2015) concept analysis of the CLE, preceptor approachability and making students feel welcomed supported student engagement in learning. Levett-Jones and Lathlean (2009) interviewed 18 nursing students from two universities in Australia to clarify the role of belongingness in their clinical experiences. This study maintained the importance of using a "lens of belongingness" (Levett-Jones & Lathlean, 2009, p. 103) when developing clinical learning experiences as well as the importance of preceptors who emulate receptiveness and acceptance toward nursing students, creating a safe, nonthreatening learning environment. This aspect of the preceptor concept was supported by Burbach et al. (2016) in their study of relationship of anxiety and self-

efficacy with knowledge acquisition during low-stakes simulation (i.e., non-threatening, not being graded) among nursing students ( $n = 120$ ). Results indicated a positive correlation between low-stakes simulation performance and knowledge acquisition. In other words, when a student felt safe, they were more able to learn. These results could be transferred to the clinical environment, where creating a nonthreatening environment could potentially improve student learning outcomes. This attribute of the preceptor pulled together the emotional aspects of the preceptor relationship with the creation of a safe learning environment where the preceptor was approachable and sensitive to the learning needs of the student. Because of its focus on being mindful of importance of creating emotionally safe learning environments and relating well with the student, this attribute was labeled as Student-Centeredness.

### ***Pedagogic Competence***

The preceptor is a clinical nurse who takes on the added role of teaching a student. Therefore, preceptors need to acquire knowledge of teaching strategies in addition to their clinical knowledge (Quek & Shorey, 2018). Bengtsson and Carlson (2015), surveyed nurse preceptors ( $N = 64$ ) in Sweden, asking what further knowledge they wanted to develop as a preceptor. Key elements identified were: tools for teaching reflective and clinical reasoning, teaching and learning strategies, the science of academic teaching, adult learning principles, and communication models. In a subsequent study, these same authors (Carlson & Bengtsson, 2015) interviewed participants after their preceptor training course ( $N = 8$ ) who reported increases in their ability to give peer support and to include reflection in teaching.

Madhavanpraphakaran et al. (2014) performed their survey study in Oman with a convenience sample of 76 preceptors to identify strategies supporting preceptors of nursing

students. Survey results indicated the importance of faculty collaboration and peer support from more experienced preceptors, as ways for newer preceptors to learn teaching strategies. This was especially important as the preceptor model for student clinical experiences had only recently been implemented. Tuomikoski et al., (2018) indicated only 39% of 576 preceptors in the study (called mentors in this study in Finland) had received formal training. Even so, these preceptors self-rated themselves as above average in reflection, supporting student learning, giving constructive feedback, being goal oriented, and identifying student needs. While formal training was not always available or provided, the expectation was for preceptors to teach effectively regardless of training or experience.

The teaching knowledge and skills associated with being a preceptor varied with studies highlighting the importance of adult learning theory and learning styles (Bengtsson & Carlson, 2015; Flott & Linden, 2015; Madhavanpraphakaran et al., 2014; Nottingham, 2015; Smedley et al., 2010), providing constructive feedback (Bengtsson & Carlson, 2015; Cotter et al., 2018; Fluit et al., 2010; Hosoda, 2006; Omer et al., 2016; Smedley et al., 2010; Tuomikoski et al., 2018), and evaluating student learning and progress toward goals (Li & Su, 2014; Madhavanpraphakaran et al., 2014; Omer et al., 2016; Shamian & Inhaber, 1985; Smedley et al., 2010; Tuomikoski et al., 2018). Yet the teaching skills needed by preceptors were viewed differently by preceptors and students. Hosoda (2006) interviewed preceptors ( $n = 14$ ) and nursing students ( $n = 20$ ) in Japan for her instrument development study. Preceptors confirmed the importance of clarifying learning objectives and providing feedback, while students prioritized being treated with respect and their questions being answered. This cluster of attributes associated with the preceptor having a *working* knowledge of adult teaching and learning strategies, was labeled as Pedagogic Competence.

### ***Clinical Competence***

Terms used in studies to signify preceptor competence included *qualified* (Golightly et al., 2017) or simply *experienced* or having clinical experience (Bengtsson & Carlson, 2015; Hosoda, 2006; Li & Su, 2014; Madhavanpraphakaran et al., 2014; Rebholz & Baumgartner, 2015). The skills recognized as associated with clinical competence included prioritization, time management, clinical reasoning, effective communication, and using standards for care (Bengtsson & Carlson, 2015; Hosoda, 2006; Hugo et al., 2018; Omer et al., 2016; and Tuomikoski et al., 2018).

Confidence and self-efficacy in clinical competence were identified as attributes of the preceptor in a number of studies (Flott & Linden, 2015; Golightly et al., 2017; Hosoda, 2006; Hugo et al., 2018; Li & Su, 2014; Martensson et al., 2016; Nottingham, 2015; Rebholz & Baumgartner, 2015; Smedley et al., 2010). Nottingham's (2015) qualitative study of 17 preceptors of undergraduate athletic trainer students included clinical experience, willingness, and confidence described as "confidence in one's self and abilities, or self-efficacy, as an athletic trainer" (Nottingham, 2015, p. 308) as qualifications of a preceptor. Several studies associated the role of the preceptor with clinical competence or its markers (Cotter et al., 2018; Flott & Linden, 2015; Nottingham, 2015; Tuomikoski et al., 2018). As a result, the term *competence* was clustered with *confidence* and *self-efficacy* to represent the level of clinical practice expected of a preceptor, a prerequisite of performing the preceptor role. These elements were combined for the attribute labeled Clinical Competence.

### ***Nurse Professionalism***

The preceptor was expected to be a role model of appropriate clinical practice and effective communication (Flott and Linden, 2015). Demonstrating an understanding of the

theoretical knowledge students were learning in school with application in practice were also recognized as a responsibility of the preceptor (Flott & Linden, 2015; Hugo et al., 2018; Madhavanpraphakaran et al., 2014; Shamian & Inhaber, 1985). Rebholz and Baumgartner (2015) interviewed hospital-based nurse preceptors ( $n=19$ ) and identified professionalism and feeling a sense of honor as attributes of a preceptor. The importance of accepting responsibility for professional growth was recognized in several studies with preceptors taking additional preceptor training courses (Bengtsson & Carlson, 2015; Cotter et al., 2018; Martensson et al., 2016; Smedley et al., 2010). Role modeling professionalism to students was identified as integral to the preceptor preparing students to be nurses (Bengtsson & Carlson, 2015; Fluit et al., 2010; Hosoda, 2006; Li & Su, 2014; Omer et al., 2016; Rebholz & Baumgartner, 2015; Rodríguez-García et al., 2018; Shamian & Inhaber, 1985). Modeling theory-based clinical practice, representing the professional role of nursing, and being committed to continuous improvement as a preceptor were synthesized into the attribute labeled Nurse Professionalism.

### **Current State of Preceptor Preparedness**

These four attributes clearly define the preceptor concept and illustrate its complexity. The preparation of preceptors to this complex role ranged from a clinical nurse with only one year of clinical experience and no formal preceptor training (Tuomikoski et al., 2018), to a master's prepared nurse with college-level preceptor training and years of precepting experience (Bengtsson & Carlson, 2015; Carlson & Bengtsson, 2015; Smedley et al., 2010). Nurses without formal training often used their prior experiences as a preceptee to direct their precepting attitudes and behaviors (Rebholz & Baumgartner, 2015; Tuomikoski et al., 2018). Studies of preceptors demonstrated a trend between increasing preceptor experience with

increasing self-efficacy and confidence in the preceptor role (Carlson & Bengtsson, 2015; Li & Su, 2014; Madhavanpraphakaran et al., 2014; Martensson et al., 2016; Rebholz & Baumgartner, 2015). Preceptor training was found to enhance preceptor confidence and self-efficacy (Carlson & Bengtsson, 2015; Smedley et al., 2010). In turn, increases in self-efficacy, recognized as self-confidence in own abilities, were associated with improvements in attitudes toward precepting (Li & Su, 2014; Smedley et al., 2010). Being asked to precept was often seen as an honor, leading to increasing personal and professional confidence (Rebholz & Baumgartner, 2015). This circular pattern of self-efficacy leading to increasing self-efficacy and better attitudes was associated with an increased willingness to precept, seen through preceptor retention (Carlson & Bengtsson, 2015). Unfortunately, the opposite was also true, that preceptors who were not prepared or lacked preceptor attributes had decreased self-efficacy (Flott & Linden, 2015; Martensson et al., 2016), potentially leading to a negative attitude toward precepting, decreasing preceptor interest in precepting with decreasing retention or commitment to the role (Dibert & Goldenberg, 1997; Omer, 2016).

The following discussion of theoretical frameworks seen within preceptor research concluded that SET most closely aligned with the study of preceptor preparedness. SET supported an exploration of the independent variables which best predicted preceptor preparedness.

### **Theoretical Frameworks in Preceptor Research**

The use of a theoretical framework to support preceptor research recognizes the depth and richness that comes from connecting theory to practice (Fawcett & Desanto-Madeya, 2013). The variety of theory used in preceptor research ranged from having no theoretical basis, to a brief mention of theory, to a strong theoretical framework design. The multiple

stakeholders (the school, the student, the preceptor, the faculty, and the clinical organization) associated with the preceptor of the capstone student multiplied the perspectives from which research has been developed. In addition, the outcomes desired as well as the motivators for the study impacted the approach or theoretical framework used to study the preceptor. This study viewed the preceptor from the perspective of the practice setting within which the preceptor of the capstone student functioned. The focus was on how the preceptor perceived themselves; how confident they felt to perform the expected preceptor behaviors identified by each item of the Cap-ExPresS. Identifying SET as the theoretical framework for this study allowed a common understanding for the reader; a basis upon which the study could be better understood. This approach further strengthened the ability to identify predictors of preceptor preparedness, supporting the development of training to address those predictors. A summary of theoretical frameworks seen within the study of preceptors follows.

### **Kanter's Model**

Dibert and Goldenberg (1995) used Kanter's model of Structural Determinants of Behavior in Organizations as the framework of their study of preceptors' perceptions. It was hypothesized that if preceptors perceived access to opportunity and power, such as through the rewards and benefits of precepting, they would be more committed to the role and ultimately be more effective in their work as preceptors. Preceptorship research continued to document the importance of rewards and benefits, both intrinsic and extrinsic, as important to the success and commitment of the preceptor to the preceptor role (Kalischuk et al., 2013; Kennedy, 2019 Madhavanpraphakaran et al., 2014). Kanter's model maintains a leader's power grows by sharing it, and thus empowering others. Collaborative efforts to share *power*, defined as resources, information, and the authority to use them, were found to promote the

preceptorship model (Dibert & Goldenberg, 1995). This collaboration was important to the role of the preceptor of the capstone student since both academic and practice partners had a stake in the success of the preceptorship. Berkow et al.'s (2009) study included over 5,700 responses from frontline nurse leaders across the U.S. ranking the practice readiness of newly graduated nurses (licensed for one year or less) to perform specific competencies. The comparison of frontline nurse leader responses with those of academia were described in Berkow et al.'s (2008) evaluative summary written for the National Executive Center Advisory Board Company. This summary quantified the differences in opinion as to the readiness of newly graduated nurses to practice safely within the clinical setting. Of the 36 competencies in the survey, there were 12 consistently ranked as not satisfactory, regardless of unit specialty or educational preparation of new graduate. Both articles highlighted the need for collaboration in preparing nursing students for practice; to determine which method of training and when during the curriculum were best to address each of the competencies identified. The capstone clinical experience guided by the preceptor, may be the most effective method to address many of these competencies such as delegation, prioritization, recognizing patient changes, and anticipating risk. Because Kanter's model supports collaboration, it may be useful to the study and preparation of preceptors.

### **Peplau's Theory of Interpersonal Relations**

Peplau's theory of interpersonal relations as used by Washington (2013) applied the four phases of relationship to preceptorship: 1) Orientation-getting to know each other and the student recognizing the need for help, 2) Identification-the student beginning to work toward objectives and recognizing the preceptor as a resource, 3) Exploitation-the student actually using the preceptor as a resource to meet objectives, and 4) Resolution-the student

achieving objectives and no longer needing the preceptor. This theory supports recognizing a preceptor-student relationship that is not effective, or not progressing through the phases of relationship, and allows targeted support to get the process back on track. As it highlights how preceptors and students interact, it may help to identify issues related to interpersonal relations, a key element of the preceptorship model. This theory concludes with the student no longer needing the preceptor. However, the goal of the capstone experience is for the student to be at a novice, generalist level of nursing preparation which indicates the student still needs the support and guidance of the preceptor to perform within the complex, often specialized clinical environment. This need for a continued preceptorship is understood as newly graduated nurses continue to work with preceptors during the transition to their nurse role.

### **Roger's Diffusion of Innovation Theory**

Roger's diffusion of innovation theory was implemented by Jones et al., (2017) when starting their dedicated education unit (DEU). Using this model, the importance of understanding the cultural make-up of the unit was recognized. Identifying the 'early adopters' within the group was key to reaching the 'tipping point', the point where the DEU innovation would begin to take hold. Jones et al. (2017) did not describe the theory in detail, but stated it was used throughout the entire process of implementation of the DEU model. Rogers' theory may support the identification of first adopters, those preceptors who will implement change; preceptors willing to learn and implement best practices for precepting. The Cap-ExPresS is being created to identify areas within preceptor preparation needing support, possibly through additional training or through the leadership of those preceptors with high levels of preparedness.

## **Benner's Novice to Expert Model of Skill Acquisition**

Recognizing the evolving nature of competencies across nurses' careers, Patricia Benner (1982), a noted theorist and academic, introduced her novice to expert nursing theory. This theory, guided by the Dreyfus model of skill acquisition (Benner, 2004), was based on three studies between 1978 and 1997 including samples of critical care nurses and senior nursing students to capture skill performance based on their variety of education and experience. Benner's (1982) theory details the characteristics of skill acquisition for each level from novice to expert nurse; it can help the preceptor understand the learning needs and learning styles of a preceptee based on recognizing their defined level of skill acquisition. Benner's theory also helps to understand the struggles of experienced, expert clinical nurses when becoming preceptors, taking on new skills in a new role as a novice preceptor (Cangelosi et al., 2009). It also could assist the preceptor in recognizing advancing levels of skill acquisition in their preceptee.

## **Synergy Models**

Alspach (2006) and Zilembo and Monterosso (2008) both developed a synergy model of preceptorship. Their models described the importance of mutually beneficial characteristics between the preceptor and student leading to successful clinical education. The ability to recognize the individuality of the student and match that to the preceptor's leadership style (Zilembo & Monterosso, 2008) led to positive outcomes of learning. The synergy model required collaborative efforts in matching students with preceptors. This process may not be feasible in situations with inadequate numbers of prepared preceptors. However, recognizing the differences in learning and teaching styles between preceptor and preceptee is important to providing a safe, student-centered learning environment.

## **Kolb's Experiential Learning Theory**

Kolb's experiential learning theory (Hosoda, 2006; Kolb, 1984) categorized four stages of learning within the preceptorship model of education: experience, perception, cognition, and behavior. In the preceptorship, the student perceives the role of the nurse using observation, interactions, reflection, and action through clinical experiences in patient care. This theory lends itself well to recognizing stages of learning and supporting the preceptor in recognizing the learning level of their student, an important aspect of pedagogic competence.

## **Symbolic Interactionism**

Symbolic interactionism (SI), a social science theory, finds meaning through interpreting human social behavior (Butts & Rich, 2018; Handberg et al., 2014; Rock, 1979). Preceptorships are based on interactions between students and preceptors, and in finding meaning through that relationship. Carlson (2012) recognized SI as a framework for studying the complex role of the preceptor. The core principles of SI include "meaning, language, and thought" (Carlson, 2012, p.458). Meaning emerges from interpretations of things. A common, learned language is used to communicate the meaning of things among humans. Thought involves reflecting on the meanings of things and interpreting them within the social and environmental context. Self is another central concept, developed through social interactions with significant others or role models. This theory seems to support the role of the preceptor as a role model of nursing. The use of critical reflection in teaching preceptees allows one to refine the meanings of things (Myrick et al., 2012). The use of nursing language effectively communicates those meanings within the context of healthcare (Carlson, 2012). The importance of reflective precepting was highlighted within SI, modeling and

teaching the use of reflection to promote critical thinking in multiple situations of patient care. The preceptor's role is to guide the student to make meanings of things they experience using critical thinking and clinical judgement within a trusting

### **SET as the Theoretical Framework**

Albert Bandura is known as the father of social cognitive theory (Bandura, 1977). Social cognitive theory explicitly placed the individual as the locus of behavioral control as opposed to the prevailing belief in stimuli directly causing behavior (Bandura, 1977). As a professor at Stanford University (a hub for those studying social cognition), Bandura researched cognitive processes and performance-based procedures in mediating behavior change in the treatment of “dysfunctional inhibitions and defensive behavior” (Bandura, 1977, p. 191). This work inductively led to Bandura's SET explaining and predicting how people chose to pursue certain behaviors. Bandura defined self-efficacy as “the belief that one can execute needed steps to achieve a goal” (Bandura, 1977 as cited by Kardong-Edgren, 2013). He further described perceived self-efficacy as a “concern not with the number of skills you have, but with what you believe you can do with what you have under a variety of circumstances” (Bandura, 1977, p.37). Self-Efficacy is not a trait but could be considered a dynamic state, one that can be learned yet is influenced by the context and perception of each situation.

Self-Efficacy is considered domain specific requiring antecedent domain-specific or contextual knowledge, personal capabilities, and role expectations. For example, a nurse can be a clinical expert with high clinical self-efficacy yet have low preceptor self-efficacy when performing the preceptor role for the first time (Miller et al., 2017). Self-Efficacy can be learned through personal mastery experience, vicarious experience, verbal persuasion, and

physiological and affective states (Bandura, 1977). These are demonstrated through formal preceptor training followed by the preceptor's demonstration of competence (mastery experience). Vicarious experience increases preceptor efficacy through watching peers who are expert preceptors or from remembering a personal preceptor during clinical experiences in nursing school. Verbal persuasion happens through debriefing opportunities with peers or supervising faculty, especially when facing difficulties. A positive physiological or affective state promotes self-efficacy as the student, faculty, or organizational leadership show appreciation for the preceptor or the preceptor receives an award or recognition for their success as a preceptor (Dibert & Goldenberg, 1995). Negative feelings or stress related to feeling unprepared or disappointment in personal performance could inhibit the preceptor from being successful. This risk of negative physiological states can be mitigated by mentoring from more experienced preceptors or encouragement and appreciation from leaders, faculty, or students.

### **Purpose of SET**

The overall purpose of SET is to explain and predict human behavior. As an explanatory theory, it explains how people learn self-efficacy (sources of efficacy) and the mechanisms involved in performing certain behaviors (motivators). SET predicts the *outcome expectations* of a behavior based on *efficacy expectations*, the major concepts of SET (Bandura, 1977). Efficacy expectations is a judgement of one's ability to execute given behaviors (Bandura, 1997). Outcome expectations is a judgement of the likelihood of the consequences such behavior will produce, indicating motivation and demonstrating level of perseverance (Bandura, 1997).

## **Propositions of SET**

The propositional statements of SET are relational and implicit, being described as:

1. The four sources of experience: personal experience, vicarious experience, persuasion, and physiological and affective state interact with the characteristics of the individual and the environmental circumstances to influence efficacy expectations and outcome expectations (Peterson & Bredow, 2017),
2. Efficacy expectations and outcome expectations are strengthened by these sources of experiences leading to changes in behavior (Bandura, 1977),
3. There is a reciprocal relationship between the performance of behavior and efficacy expectations (Bandura, 1977),
4. Self-efficacy is a mediator of successful performance of behavior, (Bandura, 1997; Oetker-Black et al., 2014), and
5. Self-Efficacy is based on performance of behaviors in the presence of adverse or difficult situations/challenges (Bandura, 2006).

The preceptorship aligns well with these propositions. The CLE has been described as unpredictable and chaotic, providing difficulties that must be overcome as the preceptor performs their role. In this study, preceptor preparedness will be measured as a level of confidence to perform precepting behaviors, which aligns with the efficacy and outcome expectations of SET.

SET includes elements of prerequisite knowledge, confidence, motivation, and development. This aligns with preceptor preparedness as the preceptor must first be a knowledgeable, competent nurse who adds the ability to teach nursing to students. Preceptors must believe in their clinical ability and in their teaching ability with nursing students. At its

core, self-efficacy is the belief in one's own ability to accomplish something despite barriers. Therefore, preceptors need motivation to perform despite the barriers inherent in the complex CLE (Bandura, 1997; Limón et al., 1981). Thus, self-efficacy was identified within the preceptorship as both a motivator and a consequence of preceptor preparedness. The following will further develop the concept of preceptor preparedness within the framework of SET.

SET was used as a framework by Goldenberg et al. (1997) and Rebholz (2014), examining the self-efficacy of preceptors working with undergraduate nursing students. Self-efficacy was defined as the preceptor's belief in their ability to perform their role despite barriers. Organizational and educational supports were found to increase the preceptor's self-efficacy, thus improving their abilities as a preceptor (Carlson & Bengtsson, 2015; Goldenberg et al., 1997; Parsons, 2006; Rebholz, 2014).

### **Overcoming barriers**

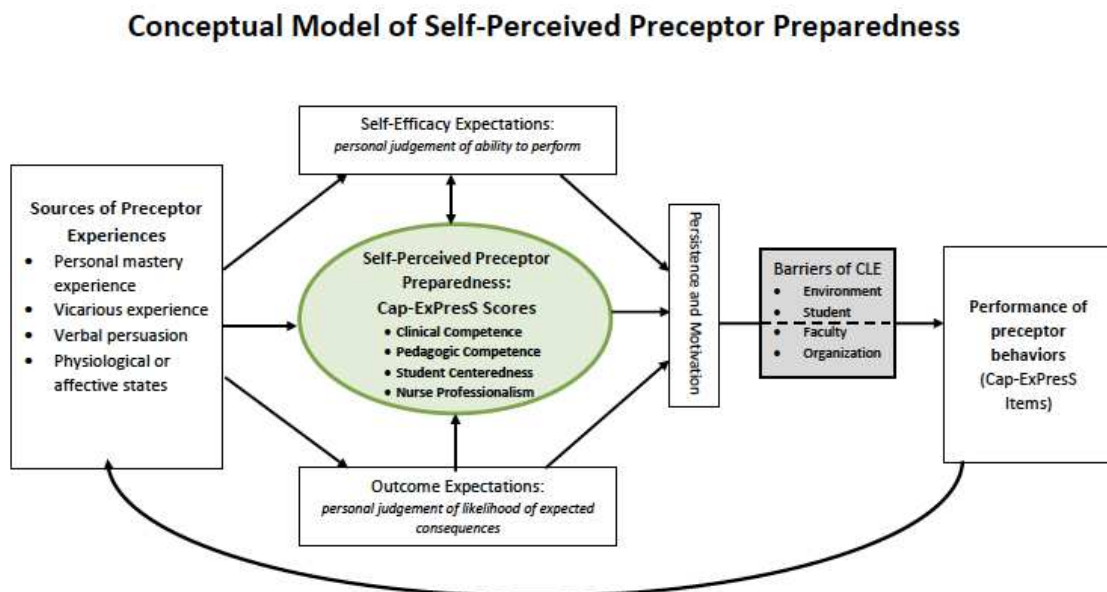
Integral to SET is the concept of overcoming barriers (Bandura, 1997), an aspect common to the preceptor role, from multiple perspectives. Barriers are caused by students when they demonstrate a lack of engagement, a lack in willingness to perform patient care activities, or a lack of feeling responsible or accountable for their actions (Christiaens, 2008). The competing priorities of the preceptor role also cause barriers; caring for patients with increasing acuity while also teaching a nursing student and maintaining safety and quality patient care is often stressful; another barrier that must be overcome. The location of the preceptorship within a random, unpredictable, and often chaotic CLE (Flott & Linden, 2015; Limón et al., 1981) is another barrier; deciding how to develop learning opportunities for the student from patient situations as they arise must be learned. A prepared preceptor combines

the pedagogic and clinical prerequisite knowledge of precepting with a belief in their ability to perform the role despite these barriers common to the preceptorship of the capstone student.

The complexity of the preceptor role has been well established. The use of a conceptual model helps simplify self-perceived preceptor preparedness as used within this study through a visual representation of the relationships involved. Figure 1.1 presents a conceptual model of preceptor preparedness as perceived by the preceptor, using SET as its framework.

Figure 1.1

*Conceptual Model of Self-Perceived Preceptor Preparedness*



### **A Conceptual Model: Explained**

The use of theory helps conceptualize a concept with its constructs and variables, and the relationships involved. See figure 1 showing an explanatory representation of self-perceived preceptor preparedness using SET as its framework. Self-Efficacy is domain-specific and preceptor preparedness is specific to the domain of the preceptor working with the capstone nursing student during their immersion experience. The preceptor learns preceptor behaviors through personal mastery (setting and meeting goals), vicarious experience (role models and personal reflection), verbal persuasion (positive evaluations, encouragement), and physiological or affective states (appreciation or stress and anxiety). These experiences either strengthen or weaken the preceptor's self-efficacy expectations and their outcome expectations, both precursors to the performance of precepting behaviors. The preceptor has a self-perceived level of preceptor preparedness detailed through the four domains of Student-Centeredness, Pedagogic Competence, Clinical Competence, and Nurse Professionalism.

When preparing to precept, the preceptor judges their ability to perform (providing persistence) along with the likelihood of being successful in meeting expected outcomes (providing motivation). In response to adequate self-perceived levels of motivation and persistence, the preceptor faces and then overcomes the barriers within the CLE in order to perform the preceptor behaviors described by the Cap-ExPresS items. The performance of behaviors is in itself a source of preceptor experience which then leads to changes (either increases or decreases) in self-perceived preceptor preparedness. For example, receiving positive feedback from the faculty or the students could increase self-perceived preceptor

preparedness, while an unengaged student could decrease it. Working through barriers is a necessary aspect of SET. Persisting through barriers, within the CLE (including the preceptor themselves) to perform precepting behaviors, leads to increased levels of confidence and/or efficacy beliefs. The Cap-ExPresS will be used to measure the preceptor's self-perceived preceptor preparedness. There was currently no tool measuring the preceptor's perception of confidence across the four domains of preceptor preparedness in the context of the preceptor working with BSN students during the capstone experience. This lack of available tools was demonstrated through the description of sampled tools available.

### **Available Measurement Tools**

While there is a growing number of tools related to nursing students and preceptors, there are still none which ask the preceptor of the BSN student to rate their level of preparedness in all four domains as defined within the preceptor concept (Student-Centeredness, Pedagogic Competence, Clinical Competence, and Nurse Professionalism). The Cap-ExPresS was developed using the four domains of the preceptor to create a scale measuring preceptor preparedness. A description of other tools available follows.

The clinical teacher characteristics instrument (CTCI) includes a self-report of four factors of preceptors: student evaluation, goal setting and individual teaching, teaching strategies, and demonstration of organized knowledge (Hsu et al., 2014). The focus is on pedagogic competency and does not address other skills and attributes of the preceptor. Hoot (2017) developed a preceptor competence assessment tool (PCAT) to be used by a clinical site coordinator in selecting preceptors. While it used Benner's skill acquisition model with clear definitions, its rubric format would limit its effectiveness in capturing preceptor preparedness. In addition, if preceptors do not rank at a certain level, they would not be

eligible to precept. The concern arises of the repercussions to preceptors and students when preceptors not recognized as competent are called upon to precept, regardless of competence, due to lack of adequate numbers of prepared preceptors. The Cotter preceptor selection instrument (CPSI) was another tool used to select preceptors but was created specifically for managers to use in selecting preceptors for new graduate nurses and not nursing students (Cotter et al., 2018). It focused on personality traits and clinical skills and displayed faulty validation methods during its development.

The nursing clinical teacher effectiveness inventory (NCTEI) was developed based on student evaluations of their best clinical teachers (Allison-Jones & Hirt, 2004). The categories measured were teaching competence, nursing competence, evaluation of students, interpersonal relationships, and personality characteristics. While this tool included aspects of all but the professionalism domain, the NCTEI was aimed at measuring faculty teaching in the clinical environment, not preceptors of nursing students, and as such, included questions that would not be pertinent to preceptors.

The study by Rusch et al. (2019) evaluated the Readiness for Practice survey, where preceptors evaluate readiness of nursing capstone students to practice within the affective, psychomotor, and cognitive domains. This survey uses the preceptor perspective to evaluate the readiness of the capstone student to practice. While the effective training of capstone students is the work of the preceptor, this survey does not measure the preceptor. The Readiness for Practice survey was developed from the academic perspective and included recommendations to improve collaborative efforts with clinical partners to better prepare nursing students for practice.

And finally, a more recent instrument developed by L'Ecuyer et al. (2020), the preceptor self-assessment tool (PSAT) allows the preceptor to self-evaluate their competence as a preceptor. This instrument was not specific to a specific context or type of preceptor, but was aimed at preceptors of nursing students, newly hired nurses, and nurses transitioning to a new role. The questions focused on the categories of nurse preceptor knowledge, skills, and attitudes identified through surveys of preceptors upon completion of a preceptor training course. This may have biased them to only recognizing those elements taught as important to the preceptor role. Again, the authors of this study are associated with academia and not the healthcare organization. From this review of the instruments available, no instrument was identified that measured preceptor preparedness (as defined in this study) to precept the BSN capstone student using self-efficacy as a framework, leading to a gap and the need for this study.

### **Conclusion**

This analysis focused on the context of the preceptor working with the BSN student during their capstone experience. The attributes of this preceptor were synthesized into four domains labelled as Student-Centeredness, Pedagogic Competence, Clinical Competence, and Nurse Professionalism. A prepared preceptor combines these attributes with a belief in their ability, or confidence, to perform the role despite barriers and will be measured as a four-dimensional self-perceived level of preceptor preparedness. Bandura's (1997) SET supports this process of learning to have belief in one's ability, leading to a preceptor who is more prepared to train a capstone student as a novice, generalist nurse. The preceptor's preparedness is gained through mastery personal experiences, vicarious experiences, verbal persuasion, and affective responses (Bandura, 1997). A preceptor's level of confidence to

perform within these four preceptor attributes, as measured by the Cap-ExPresS, is hypothesized to be influenced by clinical RN experience, preceptor experiences and training, and affective responses to precepting collected within the demographic section of study survey. Through further analysis, the ability of independent variables to influence Cap-ExPresS scores were evaluated.

The ability to measure the four-dimensional variable of preceptor preparedness within the domain of the capstone experience was not possible before the development of the Cap-ExPresS. The tools currently available either did not measure the full dimensionality of preceptor preparedness, did not allow the preceptor perspective, were written from an academic perspective, or they did not focus on the population or context of this study, the capstone student experience. This analysis provided clarity to the preceptor concept and to preceptor preparedness and led to creating the initial Cap-ExPresS. The psychometric testing of this instrument supported the structure of preceptor preparedness as being four-dimensional, while correlation and regression analyses further analyzed SET as a predictor of preceptor preparedness. A valid and reliable Cap-ExPresS will advance the study of preceptor preparedness through providing a measurement tool used in further correlational research, learning needs assessments, and educational intervention studies, thus moving preceptor preparedness science forward.

## CHAPTER 3

### METHODS

A pilot study was completed (Sept. 2020) with the purpose of developing and psychometrically testing a preliminary instrument measuring preceptor preparedness. Through the pilot study it was possible to evaluate processes and decisions being made, leading to lessons learned which improved the plan for this study. The Capstone-Experience Preceptor Preparedness Scale (Cap-ExPresS) was developed with demonstrated process, content, and face validity as well as construct validity as evaluated through an exploratory factor analysis (EFA). The Cap-ExPresS began with a pool of 109 items created to represent preceptor preparedness. Through the pilot study ( $n = 181$ ), the scale was reduced to 34 items with four factors aligning with the four domains of Student-Centeredness, Pedagogic Competence, Clinical Competence, and Nurse Professionalism. This study used lessons learned from the pilot study and best practices of instrument development to perform reliability and validity testing of the revised Cap-ExPresS. The pilot study was limited by the smaller size of the sample leading to an increased reduction of items to maintain strong power. This and the homogeneity of the sample may have led to the removal of items important to preceptor preparedness in other samples. Thus, a revised Cap-ExPresS with 67 items allowed a reevaluation of items using a more diverse sample of participants. Methods used to revise the Cap-ExPresS will be discussed.

#### **Design**

The pilot study used an exploratory sequential mixed-methods design to develop and then psychometrically test the Cap-ExPresS. This study built upon that work and used a cross-sectional multi-site survey design with additional psychometric testing of the Cap-

ExPresS using EFA with item reduction analyses through item-to-item correlations, Cronbach's alpha if item removed, and frequency histograms. Analyses between demographic and preceptor experience data with Cap-ExPresS scores were performed to identify relationships and if SET supported the study of preceptor preparedness. In other words, does a preceptor with more RN experience, precepting experience, preceptor training, and a higher level of enjoyment precepting, tend to have higher levels of confidence in performing preceptor behaviors, skills, and attitudes as measured by the Cap-ExPresS. Such a finding may support the use of SET as a predictor of preceptor preparedness, thus strengthening SET as a theoretical framework for the study of preceptor preparedness and the development of this instrument.

### **Aims, Research Questions, Hypotheses**

#### **Specific Aims**

The specific aims of this study were to (1) explore through EFA and item reduction analysis the construct validity of the revised Cap-ExPresS, (2) evaluate the reliability of the revised Cap-ExPresS, (3) explore the correlations and regressions between the revised Cap-ExPresS scores and preceptor demographic and experience data, identifying the line of best fit for predicting revised Cap-ExPresS scores. A secondary aim was to identify the overall and domain-specific levels of preceptor preparedness for the test sample as measured with the revised Cap-ExPresS.

#### **Research Questions (RQ)**

Research questions for this study included: (RQ1) What is the factor structure of the preceptor preparedness as identified through EFA, second-order EFA, and item reduction analysis of the survey responses? (RQ2) What is the internal consistency reliability and the

test-retest reliability of the revised Cap-ExPresS? (RQ3) What are the correlations and regressions between Cap-ExPresS scores (dependent/outcome variable) and independent/predictor variables, including the line of best fit predicting Cap-ExPresS scores? A secondary research question was: What are the Cap-ExPresS scores and the domain-specific scores for this sample of preceptors in total and when divided by site location?

### **Hypotheses**

Using SET as a framework in the prediction of preceptor behavior, it was hypothesized that those clinical nurses with increased experience as RNs, having received preceptor training, and increased precepting experiences would have higher Cap-ExPresS scores, and thus greater levels of preceptor preparedness within the four domains of Student-Centeredness, Pedagogic Competence, Clinical Competence, and Nurse Professionalism. It was also hypothesized that preceptors who volunteered and/or had higher levels of enjoyment precepting would have higher Cap-ExPresS scores.

### **Setting**

The setting for the pilot study was limited to one site, an 892 staffed-bed (American Hospital Directory, 2020), urban academic medical center with 238 preceptors of BSN students in 2019 (MOKAN, 2020). This organization had Magnet designation, an American Nurses Credentialing Center certified residency program, and unit-based educators with a strong centralized education department that trained preceptors and managed capstone experiences.

The setting for the present study was five hospitals: Hospital 1, a 460 staffed-bed (American Hospital Directory, 2020) urban hospital in with 117 preceptors in 2019 (MOKAN, 2020); Hospital 2, an urban 184 staffed-bed (American Hospital Directory, 2020)

community hospital with 58 preceptors (MOKAN, 2020); Hospital 3, an urban 367-staffed-bed (American Hospital Directory, 2020) comprehensive, educational medical center for children, with 152 preceptors (MOKAN, 2020); Hospital 4, a 411 staffed-bed (American Hospital Directory, 2020) municipal, public hospital with 76 preceptors in 2019 (MOKAN, 2020); and Hospital 5, a 462 staffed-bed (American Hospital Directory, 2020) Catholic community hospital in with approximately 150 preceptors. The Covid-19 pandemic began in March 2020 and impacted the recruitment for the pilot study. Deciding to be prepared for such uncertainties during the continuing pandemic, Hospital 6, a for-profit 400-bed community hospital with approximately 45 preceptors annually, was a back-up recruitment site. Hospitals 1 and 2 were not able to participate so the final setting included Hospitals 3, 4, 5, and 6. Participation as non-engaged research partners was agreed upon with letters of support received from all site contacts (Appendix A).

### **Sample**

The target population for this study was preceptors who were clinical RNs providing direct patient care in an organization that supported BSN capstone student experiences. The sample size for an EFA is inter-connected with the number of items in the scale. The methods used to determine the number of items for the proposed study and then the subsequent number of preceptors needed for adequate power for the study are discussed.

With no national registry of preceptors in the US, ethnicity and age of the preceptor population was estimated from the general RN population. Registered nurses in the US self-identify as Caucasian (75.4%), Black (9.9%), Asian (8.3%), Hispanic (4.8%), two or more races (1.3%), American Indian or Alaskan [0.4%] (Minority Nurse, 2020), with 89.9% being female averaging 51 years of age (NCSBN, 2020). The pilot study sample included  $N = 338$

total preceptors who began the survey with a mean age of 32.44 years ( $N=286$ ).

Race/ethnicity were completed by 295 of the RNs demonstrating 257 Caucasian (87.1%), 19 Hispanic or Latino (6.4%), 14 Asian (4.7%), 11 Black (3.7%), 7 American Indian or Alaska native (2.4%), 3 Native Hawaiian or Pacific Islander (1.0%). This sample does not match the race/ethnicity make-up of RNs in the U.S. The age of the nurses was also much lower than the average age of RNs in the U.S. It is not known if younger nurses tend to precept capstone students more than older nurses. However, these statistics further decreased the generalizability of results from the pilot study.

In the pilot, the site's Magnet status, preceptor training programs, and residency program may have impacted scores or the level of preceptor preparedness, making it not generalizable to preceptors from organizations without these benefits. Also, the smaller number of items (34) produced by the EFA may have eliminated items important to the preceptor preparedness of other samples, strengthening the need for additional testing of a longer Cap-ExPresS using a larger, more diverse sample of preceptors. The sample size for the current study was proposed based on a ratio of 5 – 10 preceptors per item and using the mean of 7.5 preceptors per item on the revised scale of 67 items, or  $N = 502$  preceptors. The processes followed for determining this sample size and development of the revised Cap-ExPresS will follow a detailed description of the initial development and psychometric testing of the 109-item Cap-ExPresS scale tested in the pilot study.

### **Creation of Scale Items in Pilot Study**

For the pilot study, initial Cap-ExPresS items were initially created based upon the four domains identified through the synthesis of the literature and concept analysis. A focused ethnographic (Knoblauch, 2005) approach was used to identify additional aspects of

preceptor preparedness. Focused ethnography is particularly useful in cultures with a distinct role both socially and functionally (Knoblauch, 2005). The culture of the preceptorship and the distinct role of the preceptor supported the use of this approach. Focused ethnography also assumes the researcher has an extensive knowledge of the field of study, true for this study, thus not requiring the embeddedness aspect of traditional ethnography necessary to learn the culture (Knoblauch, 2005). The preceptor role was considered a distinct role within the preceptorship culture which included the clinical environment, organizational culture, school expectations, faculty involvement, and the preceptor's level of preparedness.

During the development of scale items, the pilot study incorporated a focused ethnographic review of student evaluations of preceptors and preceptor excellence award nominations, both created actively within the culture of the preceptorship. The student evaluations were completed by BSN students at the conclusion of their precepted capstone experience. The evaluations were collected without identifiers and stored in a shared database available to member school and clinical partners (MOKAN, 2020) in the greater Kansas City metropolitan area and from schools of nursing as far as Springfield, Missouri; Lincoln, Nebraska; and Hays, Kansas. Students evaluated the orientation and feedback provided by the preceptor; the consistency of supervision, support, and direction given by the preceptor; and the most and least beneficial clinical experiences they had during their capstone experience. Other comments and suggestions were encouraged. Permission was granted by the researcher's organization to review de-identified preceptor excellence nomination awards for 2018 and 2019. Each year learners/preceptees or preceptor peers identify and nominate preceptors considered to be exemplary in the role, with detailed

descriptions provided. This focused ethnographic approach was effective in providing additional items related to preceptor characteristics and behaviors.

Using expertise in item writing and an understanding of preceptor preparedness, an initial pool of items was extracted from a review of the literature (including other instruments), a concept analysis of the preceptor, and a review of pertinent documents. The next step was testing the instrument for content, process, and face validity.

### **Content Validity**

Following established methods for evaluating instrument validity (Boateng et al., 2018; Costello & Osborne, 2005; DeVellis, 2017; Furr, 2018), content validity was established using a total of six experts with specific knowledge either of the topic of interest, instrument development, or the target audience. This group of experts included two professors with preceptor expertise and item writing expertise, one professor with instrument development and psychometric evaluation expertise, a professional development specialist responsible for the preceptor training program at the setting for the pilot study, a preceptor excellence award recipient, and a preceptor who was also employed as an adjunct faculty for nursing students. These experts were asked through a combination of non-structured interviews and individual written evaluations if each item was necessary to preceptor preparedness, if any aspects of preceptor preparedness were missing from the items, as well as for readability, and understandability of the items (Furr, 2018). As a result, items were added including: *know the policies and regulations of the organization for students, provide opportunities to see the range of nursing roles, and recognize when words of encouragement are needed*. While professors indicated the importance of *certified in area of specialty*, the preceptor experts did not feel this item was needed for preceptors of capstone students, so it

was removed. The expert preceptors wanted to remove *encourage being responsible for a full patient load*. However, since this was a specific outcome expected from the capstone experience (AACN, 2008), it was retained. This led to a pool of 109 items created for the pilot study.

### **Process and Face Validity**

Next, process and face validity of the scale were evaluated by members of the target population (Furr, 2018). This group included three preceptors with one, three, and seven years of RN experience. The RN with one year of experience had just completed a capstone preceptor experience. The other two RNs had completed multiple precepting experiences with capstone students and newly hired RNs. Process validity was evaluated through cognitive interviewing of each preceptor, individually. Each preceptor was asked to describe their psychological processes when answering scale items. Their responses were compared to the processes participants were expected to use (Furr, 2018). Items that did not elicit the expected processes of thought were reworded for clarity. Item responses were also evaluated by asking the preceptor to agree or disagree to the item's importance to precepting capstone students. No items were removed.

Before performing this process validity testing, the response format had been changed to align with SET (Bandura, 2006) by asking for the preceptor's level of confidence in performing each item, an indicator of their level of preceptor preparedness. The level of confidence was measured on a six-response summated rating scale to avoid equivocation and to increase the precision of the scale (Vaske et al., 2017). Items were labeled with 1 (*Not at all confident*), 2 (*Only slightly confident*), 3 (*Somewhat confident*), 4 (*Moderately confident*),

5 (*Mostly confident*), and 6 (*Totally confident*) [Bandura, 2006; Polit & Beck, 2017]. The preceptors found this response rating method easy to understand.

Finally, these same preceptors were interviewed for face validity; was the scale pertinent and did it represent their true understanding of preceptor preparedness when working with capstone students. Face validity is not a strong predictor of validity, but is considered a motivator to completing a survey, an important consideration due to the length of this survey (Furr, 2018). After revising the scale based on feedback from experts and preceptors, a final version of the Cap-ExPresS with 109 items was established for the pilot study, with all three preceptors providing face validity.

### **Construct Validity**

Item-reduction analysis supports the testing of construct validity. The pilot used *item correlations*, *item to total correlations*, and *Cronbach's alpha if item removed* procedures for item reduction. The items were first divided into the four domains of Student-Centeredness, Pedagogic Competence, Clinical Competence, and Nurse Professionalism. Each domain was then evaluated and reduced separately with reliability testing using IBM® Statistical Package for Social Sciences version 24 (SPSS). For *item correlations*, items that were highly correlated indicated they could be duplicates and were considered for removal. Items with low correlations,  $< .30$  (Boateng et al., 2018) were potentially not related to the domain and were considered for removal as well. For *adjusted item to total correlations*, no items met the recommended cut-off ( $< .30$ ) for item removal (Boateng et al., 2018). For the *Cronbach's alpha if item removed*, the goal was to maximize alpha (DeVellis, 2017); if the alpha decreased when an item was removed that item was considered important to the domain; if the alpha increased or was unchanged, the item was not essential to that domain and was

considered for removal. Homogeneity of the pilot sample led to increased correlations (Furr, 2018), impeding the ability to use standard cut-offs to remove or keep items. Multiple iterations using tighter cut-off values to identify the most consistent items for each domain, led to a sample of 34 items which was used for EFA.

### **Scale Revision for Current Study**

The EFA process involves multiple decisions by the researcher. Due to the original study being a pilot and the sample including participants from just one hospital, it was decided to revise the scale to allow reevaluation of final items from the sample from multiple hospitals. Rather than using the same 34 items identified through the pilot study EFA, items were reconsidered for inclusion, beginning with the initial 109 items. Items were divided into the four domains as with the pilot study. *Inter-item correlations* and *Cronbach's alpha if item removed* procedures were mimicked from the pilot study to reduce the original 109 items for the proposed study. The *inter-item correlations* for each domain were performed and cut-offs for correlations were set at  $> .800$  or  $< .400$  considered for removal after considering their importance to the domain and to preceptor preparedness in total. The *Cronbach's alpha if item removed* was also performed with items causing no change or an increase in alpha when item removed being considered for removal. Each domain was evaluated individually and resulted in a total of 67 items in the revised Cap-ExPresS (see Appendix B).

### ***Student-Centeredness***

This domain began with 33 items. There were three correlations  $< .400$  and 17 correlations  $\geq .800$ . The Cronbach's alpha for the domain was .983 and every item when removed also had an alpha of .983 indicating all items could be equally important to the domain. Removal of items was then based on correlations and a thoughtful review of

importance to the domain, leading to the removal of 11 items with 22 items retained in the domain.

### ***Pedagogic Competence***

The Pedagogic Competence domain began with 30 items. The inter-item correlations revealed three  $> .800$  and one  $< .400$ . After consideration of the item's importance of these items to the domain and to preceptor preparedness in total, all four items were removed. The domain's Cronbach's alpha was  $.979$ . The *Cronbach's alpha if item removed* lead to alphas of  $.979$  or  $.978$ . It was decided to remove those items with an alpha of  $.979$  as they were determined not to be necessary to the domain leaving the pedagogic competence domain with 18 items.

### ***Clinical Competence***

The domain of Clinical Competence began with 12 items. There were no items meeting the cut-offs for *inter-item correlation*. The Cronbach's alpha of the domain was  $.943$ , with a range of  $.936$  to  $.942$  for *Cronbach's alpha if item removed*. The alphas for each item decreased if the item was removed, indicating all items were important to the domain and none were removed.

### ***Nurse Professionalism***

This domain began with 34 items. Using *item-to-item correlations*, there were 14  $< .400$ , 3  $> .800$ . When reviewing the results of *alpha if item removed*, one item (leave work on time even when precepting) caused the alpha ( $.972$ ) to improve; it rose to  $.973$  when removed. After thoughtful consideration, 19 items were removed based on statistical cut-offs and the item's importance to the domain and preceptor preparedness, leaving 15 items representing the Nurse Professionalism domain.

## Sample for Current Study

The current study used a revised Cap-ExPresS with 67 items and four dimensions of preceptor preparedness. With EFA, the number of items informs the sample size. Exploratory factor analysis is considered a *large sample procedure* (Costello & Osborne, 2005), as “a larger sample implies lower measurement errors and more, stable factor loadings, replicable factors, and generalizable results...” (Boateng et al., 2018, p. 8). According to Costello and Osborne (2005), studies recommended sample sizes for EFA of 2-5 participants per item while Boateng et al. (2018) described 10 - 20 participants per item, and still others suggested using a graded scale, with “100 = *poor*, 200 = *fair*, 300 = *good*, 500 = *very good*, and > 1000 = *excellent*” (Comrey & Lee, 1992, as cited in Boateng et al., 2018, p. 8). Choosing to use 5 - 10 participants per item led to a range of 335 – 670 preceptors with a mean of 502 preceptors for strong power or a *very good* sample size.

The pool of available preceptors from the five recruited hospitals was estimated at 553 during 2019. With the decreased numbers of students in 2020 due to the Covid-19 pandemic and the temporary, intermittent cessation of clinical experiences in the Midwest, the numbers of preceptors for 2020-21 was smaller than previous years. However, using the total of 553 preceptors (from 2019) annually for just two school years, 2017-2018 and 2018-2019, there were up to 1106 preceptors available. Based on an average response rate of 68% estimated from four similar preceptor surveys (Allen et al., 2012; Hugo et al., 2018; Madhavanpraphakaran et al., 2014; Rusch et al., 2019), a sample of 752 preceptors was anticipated, with 170 estimated for the retest.

The response rate (RR) for online surveys has declined in the past few years when compared to the paper survey (Saleh & Bista, 2017). However, there are steps recommended by Saleh and Bista (2017) which may increase RRs that are pertinent to this study:

- the research is of interest to the sample,
- the survey asks participants for help,
- reminder emails are sent to participants to remind them to complete the survey,
- clear instructions of the length of the survey and estimated time to complete the survey are provided,
- the email is sent from someone the participants know (hospital site participant),
- the word ‘survey’ is not placed in the subject line of the invitation email, and
- an incentive for participants is offered.

Each of these suggested elements was included in this study to potentially increase the RR (Saleh & Bista, 2017). To recruit at least 502 participants from a sample of  $N = 752$  would require a RR of 67%, which is slightly lower than the 68% average of similar studies of preceptors. Anonymity was considered an important consideration and was emphasized, as it increases RR (Saleh & Bista, 2017). Since a retest was planned, participants were asked to provide a self-generated code to match test-retest data; while preventing identification of the participant, it may also have decreased the participant’s perceived anonymity. This method of coding will be discussed later.

### **Inclusion/Exclusion Criteria**

Each recruited hospital site reported supporting preceptors of capstone students. Therefore, the inclusion criteria for participants were: (1) employed by a recruited site, (2) RN licensed for at least eight months, (3) providing direct patient care, and (4) had precepted

or intended to precept a capstone student. Exclusion criteria were (1) RN licensed for less than eight months, (2) was not providing direct patient care, or (3) had not or did not intend to precept a capstone student. Participant eligibility was confirmed by screening questions at the beginning of the survey.

### **Instrument: Demographics and Items**

The instrument used for this study was also the subject of study, the Cap-ExPresS. A preliminary pilot study developed 109 items which was reduced to 34 items through EFA and item-reduction analyses. This 34-item scale demonstrated high internal consistency reliability with over-all Cronbach's alpha of .97 and alphas for the four factors from .87 - .97. The pilot study EFA supported the construct validity of the Cap-ExPresS as having four dimensions or factors (see Appendix C). A second-order EFA was performed using the factor correlation matrix as data. The global Cap-ExPresS score accounted for 54.94% of the variance, and each factor had loadings  $> .500$  in the factor matrix. The results of the pilot study provided good evidence for treating the Cap-ExPresS both uni-dimensionally and multi-dimensionally. In other words, the scale scores could be reported as a mean total score (the construct of preceptor preparedness) or it could be reported as mean scores of each subscale, using four dimensions as hypothesized.

The main study tested the reliability and validity of a revised 67-item Cap-ExPresS by performing EFA, second-order EFA, item reduction analysis, internal consistency reliability, and test-retest reliability on the collected responses. In addition, correlations and regressions were performed to identify trends in relationships between variables and to explore the appropriateness of SET as a theoretical framework for the study of preceptor preparedness and the development of the Cap-ExPresS.

## Procedure

Approval for this study was obtained from the University of Missouri- Kansas City (UMKC) Institutional Review Board (IRB), including approval of consent procedures. Participants were instructed that responding to the items in the survey constituted their consent. Participating research sites relied on the UMKC IRB as non-engaged participants. No sites required additional approval by their own IRBs. No personal identifiers were collected; however, a code was created by participants who volunteered to participate in the retest (discussed below) so their first time-point responses could be matched to their second time-point responses. The study data were collected and managed securely using Research Electronic Data Capture (REDCap), hosted by UMKC. Only the primary researcher and research mentors had access to password-protected data within REDCap. All precautions were maintained to protect the identity of participants. While an assurance of anonymity was provided and was known to increase response rate (Saleh & Bista, 2017), the benefits to instrument development by re-collecting data from participants through test-retest reliability outweighed any supposed risks to anonymity.

The week before beginning the study, Hospitals 1 and 2 withdrew from the study due to conflicting priorities within their organizations at the time. This potentially placed the sample size in jeopardy. However, Hospital 6 agreed to participate, and it was decided to proceed. Therefore, the study packet was emailed to hospital contacts for Hospitals 3, 4, 5, and 6. As non-engaged partners, each hospital contact emailed the study packet to all their clinical nurses, thus minimizing selection bias. A link within the study packet email directed participants to the Cap-ExPresS study survey. Initial survey questions screened nurses for inclusion/exclusion criteria. There was no division into groups or any intervention. Survey

completion was predicted to take approximately 10-12 minutes, estimated from 8 questions per minute (personal communication, J.M., December 2020) and preceptors had four weeks to complete. Email reminders were sent at 2 weeks and again at 3 weeks (Saleh & Bista, 2017) to each hospital contact who then forwarded the reminder emails to their clinical nurses. When the survey was completed, participants were offered a certificate of participation they could print off for their professional portfolio, a desired reward of precepting (Dibert & Goldenberg, 1995). A separate survey link was offered where participants could choose to provide their email address and a gift card of appreciation would then be sent. All clinical nurses were asked to participate in the retest which included taking the survey a second time beginning four weeks after the first survey closed and following the same procedures. Participants were offered a second gift card for their time.

Funding for this study was awarded by UMKC Women's Council Graduate Assistance Fund and SIGMA/Chamberlain School of Nursing Education Research Grant (Guthrie, 2021-2022) and will be used to purchase gift cards for participants. The monies were awarded in November 2021. Because two of the four participating hospitals did not allow their nurses to receive gift cards and few participants requested gift cards, other options are being pursued with the participating hospitals to support preceptors. The final monetary amounts for gift cards will be determined based on number of final participants and options finalized with site contacts and approval of the grant funder.

To allow matching of the data (necessary for test-retest reliability), participants created a code based on answers to questions that were "salient, constant, non-sensitive, easily to consistently format, and not easy to decode" (Audette et al., 2020, p. 178). Audette et al. (2020) recommend the use of self-generated identification codes (SGICs) to maintain

anonymity for longitudinal studies, using responses to “birth month, assigned sex at birth, first initial of first middle name, first initial of mother’s first name, and number of older siblings” (Audette et al., 2020, p. 182) to create SGICs. Due to the low percentage of males in nursing and to maintain a greater sense of anonymity for all participants, sex at birth was not used to create the SGIC. The four remaining questions were used by participants to create SGICs for the test and retest. Match rates using SGICs usually range from 61.2% to 94.7% (Audette et al., 2020).

While the nature of the Cap-ExPresS could be considered somewhat sensitive, participants were assured of processes used to protect their identity and the confidentiality of their data. Any presentation or publishing of results will be done in aggregate form. During data analysis, individual scores/responses were only compared to scores by the same individual using their SGIC for matching during test-retest reliability. Such protections are important to the reliability of the process as preceptors may not be honest in answering questions when they are concerned their identity may be known (Aulette et al., 2020; Furr, 2018). The risks of performing the retest were weighed and discussed with a committee member, psychometric expert, and it was decided to proceed with the test-retest process.

Study packet instructions informed participants of the study’s purpose, that results would only be used for research purposes, and data would be protected and kept confidential. The following instructions were included in the introductory email: voluntariness of the study, timing of survey completion (4 weeks), ability to withdraw or leave questions blank, participation status will not impact preceptor status, and completion of survey indicated consent. Participants were made aware of benefits including helping to refine the Cap-ExPresS as an instrument measuring preceptor preparedness, identifying predictors of Cap-

ExPresS scores, a certificate of participation, and a gift card (if requested) as funding had been awarded. Risks were minimal and related to personal reflection on precepting ability.

### **Data Analysis**

For the main study, data analysis was managed by SPSS. Data were exported securely from REDCap into SPSS, cleaned and edited as needed. Descriptive statistics were performed (Table 3.1) and data inspected for outliers using frequency distributions. Missing data were addressed by substitution with mean. During the pilot study, an anomaly was identified in data collection where only 181 of 369 participants completed the items. This led to large amounts of data not being captured, both extending the time needed for recruitment and forcing additional reductions of the scale to allow adequate power with a participant to item ratio of 5:1 (Costello & Osborne, 2005). After careful review, the anomaly was attributed to the order of questions and the logic applied within the demographic and preceptor status questions. These sections of the survey were revised for the main study.

**Table 3.1**

*Demographics, Variable Level, and Planned Analysis*

Data Point	Variable Level	Planned Analysis
Age	Continuous	Mean, range, standard deviation
Race/Ethnicity	Categorical	Frequencies, proportions
Level of Nursing Education	Ordinal	Frequencies, proportions
Years as RN	Continuous	Mean, range, standard deviation
Precepting Experiences	Categorical	Frequencies, proportions
Preceptor Training	Categorical	Frequencies, proportions
Enjoyment of Precepting	Continuous	Mean, range, standard deviation
Voluntariness of Precepting	Categorical	Frequencies, proportions
Level of Confidence	Continuous*	Mean, range, standard deviation

Note: \*Summated rating scales are strictly ordinal but will be considered continuous for this analysis as is customary to support more powerful analyses (Polit & Beck, 2017).

To support answering the research questions guiding this study additional analyses were completed. The analyses supporting each research question (RQ) are described below.

### **RQ1**

What is the factor structure of preceptor preparedness as identified through EFA, second-order EFA, and item reduction analyses of the survey responses? An EFA with oblique rotation using promax method and principal axis factoring (PAF) extraction method were performed on the 67 items of the main study. The oblique rotation allowed for items to be correlated, as factors of this scale were found to correlate in the pilot study. To identify the optimal number of factors, a visual scree plot (VSP), and eigenvalue-1 criterion were used (Furr, 2018). The number of factors identified by eigenvalue  $> 1$  should account for  $> 60\%$  of the variance, with each factor contributing  $\geq 5\%$  of variance (Furr, 2018; Polit & Beck, 2017). The pilot study demonstrated both a one-factor and a four-factor solution as possible, while examination supported the four-factor structure as most appropriate to preceptor preparedness. The number of factors identified in this study further maintained the four-factor model of preceptor preparedness as recognized during its conceptualization and instrument development, and supported by pilot study results.

EFA and additional item reduction techniques were applied to support identification of the items to retain. Beginning with 67 items, the EFA correlation matrix was inspected for negative correlations as there were no planned negatively scored items, and no items were identified for removal. Items with correlations between .30 and .70 in the correlation matrix, or factor loadings  $\geq .400$  in the factor matrix were kept. Items in the factor matrix with low loadings on all factors or high loadings on multiple factors were considered for deletion. Iterative analyses with EFA and internal consistency reliability were performed. Items were

evaluated for loading on expected factors, maintaining factor structure and Cronbach's alpha scores  $\geq .80$  (Furr, 2018) which support stability of the scale, strengthening its construct validity. Further item reduction analysis included evaluating frequency histograms for each item. Items with extreme values of 1 or 6 are not discriminatory and were considered for removal (Furr, 2018).

## **RQ2**

What is the internal consistency reliability and the test-retest reliability of the updated Cap-ExPresS? The internal consistency of the overall scale and of each dimension were estimated with a Cronbach's alpha  $\geq .80$  indicating adequate internal consistency (Furr, 2018). The results of test-retest reliability were calculated using Pearson's  $r$  correlations with an  $r \geq .70$  being acceptable (DeVellis, 2017; Shrout & Fleiss, 1979). The retest included those items remaining after the EFA and item-reduction measures were implemented. The sample size for the retest was initially determined based on adequacy for EFA using the 34 items identified in the pilot study; aiming for 5 participants per item meant a sample of 170 participants (5 participants per each of 34 items = 170 total participants) was estimated for the retest. However, it was decided not to perform another EFA on the retest sample data. In a comparable instrument development study measuring self-efficacy in clinical performance of nursing students (Cheraghi et al. 2009), test-retest reliability was performed to determine stability of the instrument. This instrument used a 37-item scale. The initial test had a sample of 207 nursing students and the retest had 15 nursing students, suggesting a lower number of participants may be adequate to evaluate test-retest reliability using Pearson's  $r$  correlation coefficient. The retest sample for this study included 23 participants.

### RQ3

What are the correlations and regressions between Cap-ExPresS scores (dependent/outcome variable) and independent/predictor variables, including the line of best fit predicting Cap-ExPresS scores? Correlations with Cap-ExPresS scores were calculated using Pearson's  $r$ ,  $p = .05$ , 95% confidence interval (Hatcher, 2013). Regressions ( $R^2$ ) were calculated between independent/predictor variables and the dependent/criterion variables (Cap-ExPresS scores), with  $p = .05$  and a 95% confidence interval (Hatcher, 2013).

Hierarchical multiple regression was performed between the independent/predictor variables of precepting experience seen through variables Cap, NGN, Exp, preceptor training, level of enjoyment precepting, voluntariness of precepting (SET variables) and the dependent/outcome variables of Cap-ExPresS scores, while holding years as RN, level of education, and race/ethnicity constant. The results of previous studies indicated a trend of higher measured preceptor outcomes with more years of RN experience which could be considered a confounding variable in this context and was added in Block 1. The majority of participants were Caucasian with a BSN or higher degree and were added as Block 2. These variables were added first to determine the percentage of variance they explained. The remaining SET variables were added next to investigate the incremental variance of adding these variables (Hatcher, 2013) as well as the total variance for all 9 variables together. Through the process of hierarchical multiple regression, the direction, significance, and strength of the relationships between predictor variables and criterion variables of preceptor preparedness as measured by Cap-ExPresS scores may be demonstrated, and a best fit equation reported. Another result of hierarchical multiple regression is further evaluation of SET as an appropriate framework for preceptor preparedness. If SET variables are found to

increase Cap-ExPresS scores, this strengthens the use of SET as a framework to develop interventions focused on these predictor variables.

A secondary question of interest to the researcher and to the participating hospital sites was: What are Cap-ExPresS scores for this sample of preceptors in total and when examined by sample location? Each site will be provided the mean overall and factor-specific Cap-ExPresS scores for their hospital participant preceptors in aggregate form. No individual scores will be provided.

### **Conclusion**

The importance of measurement in preceptor research has been identified in the literature. Preceptor research and the level of preceptor preparedness to work with nursing students has been limited by both the lack of instruments and a lack of clarity of the preceptor concept and thus of preceptor preparedness. The validity and reliability of the Cap-ExPresS were evaluated through this study using EFA and additional statistical analyses to determine the best structure of the Cap-ExPresS and the equation of best fit for its predictability. With the Cap-ExPresS, preceptor preparedness can be measured and studied leading to advancements in the science of how best to prepare preceptors. Future studies using the Cap-ExPresS could include educational intervention studies, additional correlational studies to identify relationships and trends in demographic data or preceptor experience data, evaluation of preceptors for selection purposes, and preceptor self-assessments to create professional development plans.

## CHAPTER 4

### RESULTS

The purpose of this study was to perform psychometric testing to evaluate the validity and reliability of the Cap-ExPresS, a new instrument developed during a pilot study measuring preceptor preparedness. This chapter will be presented in three sections. The first section is a summary of the sample and setting. The second section reports validity and reliability testing, and the final section presents correlation and regression results, organized using aims and research questions.

#### **Sample and Setting**

The eligible target population for this study included clinical nurses providing direct patient care, who were registered nurses at least eight months, and had precepted a capstone student or were considering precepting a capstone student. All clinical nurses at four participating hospitals were invited to participate: the first three questions of the Cap-ExPresS instrument self-screened for eligibility. The projected sample size was based on a ratio of 5 – 10 preceptors per item; using the mean of 7.5 preceptors per item on the revised scale of 67 items ( $7.5 \times 67 = 502$ ) which indicated a desired sample size of  $n = 502$  preceptors.

There were four hospitals in this study, relabeled as Hospital A, B, C, and D, representing three different states in the Midwest: Kansas, Missouri, and Indiana. These study sites included Magnet hospitals, academic centers, faith-based hospitals, and community hospitals. Each of the four hospital contacts sent emails to their clinical RNs who then self-screened for eligibility through the first three questions. Site contacts did not choose participants or determine eligibility. This helped minimize selection bias. The same process

was followed for the retest. There were 41 (34.7%) participants from hospital A, 5 (4.2%) from hospital B, 28 (23.7%) from hospital C, and 44 (37.3%) from hospital D for a total of 118 participants in the sample for this study.

### **Demographics of Study Sample**

The demographic items of age, race/ethnicity, number of years as an RN, and level of education were collected as well as variables indicating preceptor experience including preceptor training received, experiences of precepting capstone students, new graduate nurses, or experienced nurses including how often for each type of preceptee. Enjoyment precepting capstone students and volunteering rather than being assigned to precept capstone students were added to precepting experience variables or SET variables, to explore the influence of SET on preceptor preparedness scores (Table 4.1). As indicated previously, there is no registry of preceptors from which to compare, so this sample ( $N = 118$ ) was compared to RNs in general, as reported by Smiley et al. (2021). A brief description of results for all variables follows.

**Table 4.1***Descriptive Statistics of Participants for 67-Item Cap-ExPresS*

Variables – Ratio	<i>N</i>	Min - Max	<i>M (SD)</i>	RN Comparison <sup>a</sup>
Age (years)	111	22 - 64	39.59 (12.4)	51
Years as RN	115	0.67 - 41	12.18 (10.9)	20
Enjoyment	110	40 - 100	81.74 (14.4)	
Variable-Nominal/Categorical	<i>N</i>	<i>n</i>	%	%
Site- Test	118			
A		41	34.7	
B		5	4.2	
C		28	23.7	
D		44	37.3	
Site- Retest	198			
A		41	20.7	
B		7	3.5	
C		66	33.3	
D		85	42.4	
Test-Retest	23			
Race/Ethnicity				
Non-Caucasian <sup>b</sup>		5	4.2	
Caucasian		112	94.9	81
Nursing Education Received*	118			
Diploma		0	0	
ADN		22	18.6	
BSN		90	76.3	65
MSN		14	11.9	
Doctorate Level		0	0	
Preceptor Training Received*	117			
No training		29	24.6	
Online training		29	24.6	
In-person training		63	53.4	
Mandatory training		33	28.0	
Optional training		26	22.0	
Provided by my organization		67	56.8	
Provided by other organization		13	11.0	
College level course		6	5.1	
Volunteered	114	49	41.5	
Assigned	114	52	44.1	

Table Continued

Variable-Nominal/Categorical	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Precepting Experience Variable*	Who Precepted	Precepted 1–3 Times	Precepted >3 Times
Cap	98 (83.1)	68 (57.6)	31 (26.3)
NGN	99 (83.9)	35 (29.7)	63 (53.4)
Exp	84 (71.2)	29 (24.6)	55 (46.6)

Notes. \*multiple responses allowed. Enjoyment = level of enjoyment precepting capstone students. BSN = Bachelor’s Degree in Nursing. MSN = Master of Science in Nursing.

Volunteered = asked to precept. Assigned = assigned to precept. Cap = precepted capstone students. NGN = precepted new graduate nurses. Exp = precepted experienced nurses.

<sup>a</sup>reported in Minority Nursing (2020). <sup>b</sup>Races other than Caucasian combined to protect anonymity of participants.

### ***Age***

The distribution of the sample (*n* = 110) age ranged from 22 to 64 with a mean of 39.60. The mode was 28 years (*n* = 8) with 50% of the RNs between 22-37 years, 25% between 38 – 51, and 25% between 52 and 64 years. The average age for RNs according to the NCSBN (2020) workforce report, was 51, indicating more than 11 years difference from the sample.

### ***Race/Ethnicity***

Of the 118 participants responding to race/ethnicity, 112 (94.9%) identified as Caucasian. The remaining 5 were Non-Caucasian. Exact race was not included to protect anonymity of the sample. Registered nurses in the U.S. self-identify as Caucasian (75.4%), Black (9.9%), Asian (8.3%), Hispanic (4.8%), two or more races (1.3%), American Indian or Alaskan [0.4%] (Minority Nurse, 2020).

### ***Years as RN***

The sample distribution of years as RN ( $n = 115$ ) ranged from 8 months to 41 years with an average of 12.17 years. Seventy-five percent of the sample had been a nurse for 17 years or less, with 25.0% for four years or less. The mode was 6 years representing 12 nurses.

### ***Nursing Education Received***

Most participants, 90 (76.3%) were educated with the Bachelor of Science in Nursing (BSN) followed by Associate Degree in Nursing (ADN) with 22 (18.6%) and 14 (11.9%) with a Master of Science in Nursing (MSN). No diploma or doctorate graduates participated. Participants were able to choose multiple responses, and several with ADNs and BSNs reported getting a second degree, representing 126 degrees total.

### ***Preceptor Training***

Participants were able to choose multiple answers for the Type of preceptor training received. Training ranged from 29 (24.6%) online, 63 (53.4%) in-person, 33 (28.0%) mandatory, 26 (22.0%) optional, 67 (56.8%) received training provided within their own organization while 13 (11.0%) received training outside of their own organization. Of the total participants ( $N = 118$ ), 29 (24.6%) reported they did not receive any preceptor training. Completing preceptor courses at the college level was rare at 6 (5.2%) participants.

### ***Precepting Experience***

Each of the 118 participants was able to select multiple answers to indicate who they had precepted and how often. Only 5 (4.2%) of the sample had not yet precepted. Of the remaining preceptor participants, 98 (83.1%) had precepted capstone students with 31 (26.3%) of them precepting capstone students more than three times; 99 (83.9%) precepted

new graduate nurses with 63 (53.4%) of them precepting new graduate nurses more than 3 times; and 84 (71.2%) precepted experienced nurses with 55 (46.6%) of them precepting experienced nurses more than 3 times.

### ***Level of Enjoyment***

The distribution of the sample ( $n = 110$ ) responding to level of enjoyment precepting or considering precepting capstone students on a scale of 0 – 100 ranged from 40 – 100 with a mean of 81.7 and a mode of 90.0 with 14 respondents; 50.0% responded with an enjoyment level of 85 or higher, and the top quartile was 94.25 or higher with ten participants choosing 100.

### ***Volunteered or Assigned as Preceptor***

Of the 114 respondents, 49 (43.0%) indicated they asked or volunteered to be a capstone preceptor while 52 (45.2%) indicated they were assigned to be a capstone preceptor and 13 (11.4%) had not yet precepted a capstone student.

### **Summary**

Most preceptor participants self-identified as Caucasian (94.9%) with a BSN level of education (76.3%). Of the 118 respondent preceptors, 89 (75.4%) had received preceptor training and 29 (24.6%) had no preceptor training. The most commonly reported training was completed in-person by 63 (53.4%) preceptors, was mandatory for 33 (28.0%) preceptors, and was presented by the participant's own organization for 67 (56.8%) preceptors. When asked their level of enjoyment when precepting or when considering precepting capstone students ( $n = 110$ ), the mean level of enjoyment was 81.7 out of 100; a high percentage of preceptors were assigned to precept a capstone student 52(45.2%) as opposed to volunteering

49(43.0%) to precept, with 31 (26.3%) having precepted more than three capstone students. The results are described below, organized by research question (RQ).

### Results by RQ

#### RQ1

What is the factor structure of preceptor preparedness as identified through EFA, second-order EFA, and item reduction analyses of the initial survey responses?

#### *EFA*

**Suitability of Data.** An EFA using principal axis factoring (PAF) and an oblique rotation method using promax were performed. The oblique rotation allowed for factors to be correlated as would be expected with a psychological scale; the pilot study showed the factors of this scale were correlated. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) score was .90 for this data set. A score of .90 or greater is considered “marvelous” (Howard, 2016) and indicates there is adequate correlation of the items to perform an EFA. If this measure were below .60, removing low intercorrelations could improve the KMO score. Bartlett’s Test of Sphericity was also performed and found to be significant. This indicated the inter-item correlation matrix was not an identity matrix (Table 4.2). The results of these two tests supported the suitability of using this data set for EFA.

**Table 4.2**

*KMO and Bartlett’s Test of Sphericity*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.898
Bartlett's Test of Sphericity	Approx. $\chi^2$	1718.623
	<i>df</i>	231
	<i>p</i>	.000

**Sample Size Adequacy.** A discussion of the sample size is important to EFA, a large sample method. The number of participants per item was considered when setting up this study. A ratio of five participants per item or 5:1 or a minimum of 200 participants is recommended (Costello & Osborne, 2005; Howard, 2016). With a total of 67 items, the original goal of 502 participants was not met. Two of the hospitals offering a support letter determined they were no longer able to support this study due to organizational needs. This eliminated 161 (32.0%) of the anticipated number of participants. The alternate hospital, Hospital 6 joined the study, bringing the number of potential preceptors up to 381 or 76.0% of the original anticipated sample size of 502 preceptors. While 224 clinical nurses began the survey, after removing data for participants who did not meet criteria or with 10% or greater missing responses, the final number of participants in the study was 118. This number is well-below the suggested 200 participant minimum for EFA (Costello & Osborne, 2005; DeVellis, 2017) or the 5:1 scale of participants to items (Costello & Osborne, 2005; Howard, 2016). The 67-item scale led to a ratio of 1.8:1, however, the final 22-item scale with 118 participants provided a ratio of 5.4:1 which is considered adequate for EFA (Costello & Osborne, 2005).

**Determining Number of Factors.** It is recommended to use multiple methods to choose the optimal number of factors to extract (Costello & Osborne, 2005). Among these are a visual scree plot (VSP), Kaiser criterion or eigenvalue-1 criterion (Furr, 2018), and the number of factors extracted accounting for > 60% of the variance, with each factor contributing  $\geq 5\%$  of variance (Furr, 2018; Polit & Beck, 2017). The VSP shows a graph of eigenvalues, the purpose being to see at what point the values begin smaller decreases, causing an 'elbow' in the graph (Furr, 2018; Howard, 2016). The number of factors above

the elbow is considered the number of factors to extract (Howard, 2016). Each of these methods was considered in determining the number of factors to extract in this study. In order to identify the VSP, eigenvalues, and percent of variance explained, an initial EFA was run. The first EFA included the 67-item scale responses of  $N=118$  preceptors in the current study. This EFA allowed the number of factors to be determined by eigenvalues  $> 1$  using SPSS Version 26. The number of factors reached 10 factors. Because the pilot study and content validity supported a four-factor model, the EFA was again run forcing a four-factor model.

The four-factor model demonstrated four factors with eigenvalues  $> 1$ , the total variance explained was 60.3%, or 67.4% with each factor explaining  $> 5\%$  of the variance using initial eigenvalues (Table 4.3). The pattern matrix began to show loadings of items that were suggestive of four-factors. An inspection of the VSP showed the 'elbow' at the fifth factor, which also supported the four-factor model (Figure 4.1). To be more certain of these results, additional models were also run using a three-factor model and a five-factor model. The three-factor model demonstrated strong loadings but had multiple cross loadings with differences  $< .2$ . The factor of Nurse Professionalism (from the four-factor model) was dispersed between factors 1 and 2, not matching content validity. The five-factor model had loadings similar in strength to the four-factor model but with multiple cross-loadings  $> .400$  and having differences  $< .2$  (Costello & Osborne, 2005). Most items remained in the same factor for Clinical Competence, Student- Centeredness, and Pedagogic Competence while Nurse Professionalism was divided in two with multiple items cross loading on more than one factor. These two models did not support the content validity of the scale. When tests for numbers of factors do not all support the same model, the researcher decides on the best

fitting model and makes a determination based on the data presented as well as their understanding of the concept being studied (personal communication, J.M. November 2021). Using the results of the pilot study, the concept analysis of preceptor preparedness, and knowledge of the purpose of the scale, a four-factor model was supported as the model of choice.

**Table 4.3**

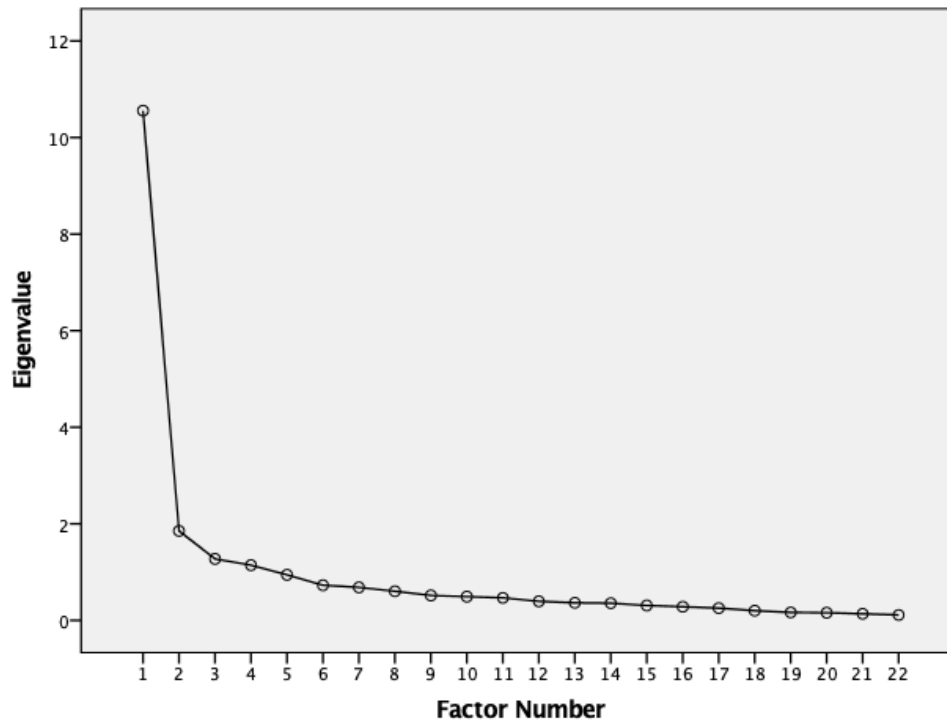
*Total Variance Explained for 22-Item Scale*

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Sums of Squared Loadings
1	10.547	47.939	47.939	10.157	46.169	46.169	8.123
2	1.861	8.460	56.399	1.486	6.753	52.921	7.920
3	1.277	5.803	62.202	.883	4.015	56.936	8.210
4	1.143	5.197	67.399	.741	3.366	60.302	4.808

*Note.* Only first 4 of 22 factors are shown. Extraction Method: Principal Axis Factoring, promax rotation, missing items replaced with mean.

**Figure 4.1**

*Visual Scree Plot for 22-Item Scale*



**Items to Retain.** Exploratory factor analysis and additional item reduction techniques were applied to support identification of the items to retain. Initially, the correlation matrix was inspected for negative correlations as there were no planned negatively scored items. No negative correlations were identified. Items with correlations  $< .30$  or  $> .70$  are typically considered for removal. Because there were many items with high correlations, specifically above  $.70$ , items with correlations above  $.80$  were considered for removal. An inspection of communalities indicates if the item is related to the other items in the scale. In a social science such as nursing, communalities of  $.40$  to  $.70$  are most common, indicating low to moderate correlation between the item and the scale or full set of items; communalities  $> .80$  are considered high but are not commonly seen (Costello & Osborne, 2005). The

communalities of the data ranged from .45 to .71, indicating all items were low to moderately interrelated and no items were removed.

### *Item Reduction Analyses*

The next step involved using the data from the 67-item test in an iterative process of EFAs to reduce the number of items. Items were removed that had a loading of  $< 0.40$  or cross-loadings  $> 0.30$  on multiple factors (Costello & Osborne, 2005). Principal axis factoring (PAF) with promax (oblique) and missing items replaced with means was used in these EFAs as well. Once a 37-item scale was reached, a closer look at the content validity was taken with items considered for removal being those loading on an unexpected factor. For example, Item 55, “Recognize when a student is struggling to understand a concept,” was loading on the Nurse Professionalism factor when it was expected to load on the Student-Centeredness factor. If after removal, the remaining items stayed in the same factor, another item would be removed following this one-at-a-time method. As a result, each of the items not loading as expected were removed while maintaining the expected structure of the scale. The final item removed was Item 17 from the Clinical Competence factor due to the presence of high cross-loading on the final EFA, even though it loaded on the expected factor. This process left a 22-item Capstone-Experience Preceptor Preparedness Scale (Table 4.4) with many strong loaders on each factor (at least .50 or greater) and at least 3 items in each factor, both expected of a strong scale (Costello & Osborne, 2005). In addition, the factor correlations of this four-factor, 22-item model ranged from 0.440 to 0.714 (Table 4.5), indicating they were adequately correlated as expected for this scale of preceptor preparedness and also supported the four-factor model.

**Table 4.4***Cap-ExPresS Item Stems, Factors, Coefficients, and Communalities of 22-Item Scale*

Item #	Item Stem	<i>Factors</i>								<i>h</i> <sup>2</sup>
		<i>1</i>		<i>2</i>		<i>3</i>		<i>4</i>		
1.	Help the student identify patterns in patient assessments	.16	(.47)	.08	(.50)	-.08	(.44)	<b>.71</b>	<b>(.78)</b>	.64
2.	Role model how to effectively manage a full patient load.	.07	(.42)	.03	(.45)	.09	(.46)	<b>.60</b>	<b>(.69)</b>	.50
4.	Provide opportunities to understand patient care across the continuum	-.16	(.40)	.07	(.53)	.37	(.59)	<b>.58</b>	<b>(.73)</b>	.61
10.	Allow time for student to troubleshoot while I maintain patient safety.	-.02	(.51)	<b>.81</b>	<b>(.82)</b>	.01	(.57)	.03	(.45)	.68
19.	Balance student independence while providing supervision.	.04	(.55)	<b>.73</b>	<b>(.81)</b>	.11	(.62)	-.05	(.40)	.66
26.	Find creative ways to teach clinical concepts.	-.09	(.39)	<b>.94</b>	<b>(.78)</b>	-.13	(.44)	-.02	(.37)	.63
27.	Encourage critical thinking through questioning.	-.07	(.45)	<b>.77</b>	<b>(.79)</b>	-.07	(.51)	.21	(.55)	.65
28.	Provide feedback immediately after an event.	.26	(.60)	<b>.50</b>	<b>(.71)</b>	-.09	(.55)	.22	(.55)	.58
31.	Progressively add to the student's responsibilities for patient care.	-.01	(.56)	<b>.68</b>	<b>(.82)</b>	.20	(.67)	.00	(.45)	.69
45.	Demonstrate respect for the student in front of patients.	<b>.51</b>	<b>(.65)</b>	.20	(.53)	.07	(.54)	-.05	(.31)	.46
51.	Always be patient when allowing student to perform a skill.	<b>.51</b>	<b>(.71)</b>	.31	(.61)	.14	(.62)	-.21	(.24)	.59
57.	Always be approachable.	<b>.65</b>	<b>(.75)</b>	.06	(.50)	.26	(.63)	-.27	(.17)	.63

Item #	Item Stem	<i>Factors</i>							
		1	2	3	4	$h^2$			
58.	Maintain eye contact when conversing with a student.	<b>.90</b> ( <b>.84</b> )	-.13 (.45)	-.04 (.56)	.12 (.42)	.71			
59.	Promote a sense of belonging for the student.	<b>.63</b> ( <b>.75</b> )	.04 (.52)	.14 (.61)	-.01 (.36)	.58			
62.	Demonstrate empathy for student fears.	<b>.75</b> ( <b>.78</b> )	-.05 (.49)	.02 (.58)	.12 (.43)	.63			
70.	Get to know my students on a personal level.	<b>.80</b> ( <b>.70</b> )	-.17 (.34)	-.06 (.45)	.12 (.35)	.52			
71.	Use a sense of humor in my work.	<b>.62</b> ( <b>.66</b> )	.07 (.46)	-.10 (.46)	.13 (.39)	.45			
73.	Demonstrate passion for being a nurse.	.22 (.65)	.08 (.58)	<b>.52</b> ( <b>.74</b> )	.00 (.40)	.58			
74.	Develop a personal plan for further growth as a preceptor.	-.03 (.59)	.11 (.63)	<b>.75</b> ( <b>.83</b> )	.06 (.47)	.70			
90.	Provide opportunities for student to practice inter-professional interactions.	.06 (.61)	-.19 (.50)	<b>.83</b> ( <b>.82</b> )	.15 (.49)	.70			
96.	Encourage the student to function as a member of our healthcare team.	.00 (.54)	.05 (.54)	<b>.70</b> ( <b>.74</b> )	.02 (.39)	.56			
102.	Always keep up to date with new practice evidence.	.07 (.53)	-.05 (.48)	<b>.68</b> ( <b>.71</b> )	.02 (.36)	.50			

*Note.*  $n = 118$ . Factor labels are 1 = Student-Centeredness (SC), 2 = Pedagogic Competence (PC), 3 = Nurse Professionalism (NP), 4 = Clinical Competence (CC). Bolded loadings are those retained by that factor. Pattern coefficients are followed by structure coefficients in parentheses. Factor correlations were as follows:  $r_{12} = .62$ ,  $r_{13} = .71$ ,  $r_{14} = .44$ ,  $r_{23} = .69$ ,  $r_{24} = .52$ ,  $r_{34} = .49$

**Table 4.5***Factor Correlation Matrix for Second-Order EFA*

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.000			
Factor 2	.619	1.000		
Factor 3	.714	.691	1.000	
Factor 4	.440	.522	.493	1.000

***Second Order EFA***

A second order EFA was performed on the primary factor correlation matrix, resulting from EFA on the 22-Item scale (Table 4.5), to offer additional information and perspective on the scale and its factors; namely if the use of a single total score added to the individual factor scores in reporting results was supported. All factor correlations (second-order EFA matrix data) were  $> .40$  and  $< .80$ . The KMO of .79 and Bartlett's Test being significant supported adequacy of using the factor correlation matrix as data for an EFA. The second-order EFA was performed using PAF and oblique rotation (promax) with  $N = 118$  participants. There were no missing data. The resulting EFA indicated only one eigenvalue  $> 1$ , explaining 57.9% of the total variance (or 67.8% for initial variance) with the one-factor model; the VSP bending at 2 factors also supported the one-factor model. Extraction of one model had loadings of 0.84, 0.81, 0.78, and 0.60 which were all strong loadings ( $> .50$ ). This second-order EFA supported the use of total scores in reporting results of the Cap-ExPresS.

**RQ2**

What is the internal consistency reliability and the test-retest reliability of the updated Cap-ExPresS?

### ***Internal Consistency Reliability***

The internal consistency reliability of the overall 22-item scale and of each dimension were estimated with a Cronbach's alpha  $\geq .80$  indicating adequate internal consistency (Furr, 2018). The Cronbach's alpha of each factor as well as the total scale were strong, the total score was 0.95, Student-Centeredness was 0.90, Pedagogic Competence was 0.90, Clinical Competence was 0.81, and Nurse Professionalism was 0.87 (Table 4.7). *Alpha if item removed* was also inspected for the total score and for each factor to verify the loaded items were necessary to the factor. There were no items if removed that increased the alpha, therefore no additional items were removed.

**Table 4.6**

*Internal Consistency Reliability of Total Score and Subscale/Factor Scores; # Items/Score*

Score	<i>r</i>	# Items	<i>n</i>
Total	.947	22	111
SC	.895	8	117
PC	.903	6	118
CC	.811	3	115
NP	.873	5	118

*Note.* *r* = Cronbach's alpha.

### ***Test-Retest Reliability***

The purpose of test-retest reliability is to determine if participants respond the same way to the same questions over time (DeVon et al., 2007). For preceptor preparedness, there is the chance the preceptor would have experiences between the test and retest that might influence their level of confidence in performing the precepting behaviors, causing changes

in item responses and thus of the scores from the test to the retest. Only 23 out of 198 preceptors included self-generated identification codes that allowed matching of the test and retest data, leaving 175 participants with data not matching.

The results of test-retest reliability (Table 4.7) were calculated using correlations between mean scores of the total scale and of each factor scale with Pearson's  $r \geq .70$  being acceptable (DeVellis, 2017; Shrout & Fleiss, 1979). The items used to evaluate test-retest reliability were those in the 22-item scale. All scores were significant, but only Clinical Competence scores met acceptable test-retest reliability  $> .70$ , only Student-Centeredness scores were considered unacceptable being  $< .50$ . Total, Pedagogic Competence, and Nurse Professionalism scores would be considered questionable or poor, ranging between  $.50$  and  $.70$ , but did not fall to unacceptable (Glen, 2016) as per Table 4.8.

**Table 4.7**

*Test-Retest Reliability of 22-Item Cap-ExPresS*

	Pearson's $r$	$p$
Total Scores	.611	.002**
Clinical Competence	.771	.000***
Pedagogic Competence	.582	.004**
Student-Centeredness	.494	.017*
Nurse Professionalism	.607	.002**

*Note.*  $N = 23$ .

**\* $p < .05$ , \*\* $p < .01$ , and \*\*\* $p < .001$**

**Table 4.8**

*Test-Retest Reliability Scale*

Scale	Level of Test-Retest Reliability
1.0	Perfect reliability
$\geq 0.9$	Excellent reliability
$\geq 0.8 < 0.9$	Good reliability
$\geq 0.7 < 0.8$	Acceptable reliability
$\geq 0.6 < 0.7$	Questionable reliability
$\geq 0.5 < 0.6$	Poor reliability
$< 0.5$	Unacceptable reliability
0	No reliability

\*Adapted from <https://www.statisticshowto.com/test-retest-reliability/>

**RQ3**

What are the correlations and regressions between Cap-ExPresS scores (dependent/outcome variable) and independent/predictor variables of age, race/ethnicity, nursing education received (BSN), type of preceptor training, level of enjoyment, years as RN, volunteered, precepted Capstone (Cap), precepted new graduate nurse (NGN), and precepted experienced nurse (Exp), including the line of best fit predicting Cap-ExPresS scores?

***Correlations***

Correlations indicate a relationship between variables and range from -1.00 to +1.00 with zero indicating no relationship, a negative number indicating as one variable increases the other decreases, and a positive number indicating either both variables increase or both decrease. Evaluating correlations was done during EFA as highly correlated variables/items indicated they represented the same thing. Removing them helped reduce the ultimate size of the scale, by removing duplicates or redundant items, those testing the same behavior. Before running correlations, categorical variables with more than two response options were

transformed into dummy variables, variables representing the variable with only two options. *Race/ethnicity* was transformed to *Caucasian* (1 = yes and 0 = no) because only five participants represented participants from racial groups other than Caucasian. *Nursing education received* was transformed to *BSN+* indicating having a BSN and/or MSN (1 = yes and 0 = no). No participants reported having a diploma or doctorate degree, thus '0' indicated participants with an ADN (17). *Type of preceptor training* was transformed to *training* (1 = yes and 0 = no), and voluntariness of precepting was transformed to *volunteered* (1 = yes and 0 = no). Pearson's correlation was used to calculate the level of correlation between variables using SPSS (Table 4.9).

**Table 4.9**  
**Correlations Between Independent Variables Including Total Test Scores and Subscale Scores**

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Years as RN	1.000														
2. Caucasian	-.059	1.000													
3. BSN	-.270**	-.129	1.000												
4. Age	.737**	-.096	-.250**	1.000											
5. Cap	.256**	-.002	-.040	.189*	1.000										
6. NGN	.197*	-.101	-.082	.116	.109	1.000									
7. Exp	.378**	-.062	-.047	.192*	.211*	.332**	1.000								
8. Training	.288**	.047	.005	.175	.319**	.393**	.376**	1.000							
9. Enjoyment	.021	-.153	.159	-.004	-.011	-.073	.061	.119	1.000						
10. Volunteered	-.076	.130	.190	-.028	.053	-.069	-.040	.112	.339**	1.000					
11. Total score	.260**	-.209*	-.128	.123	.091	.188*	.225*	.124	.435**	.122	1.000				
12. SCscore	.122	-.204*	-.071	.070	.013	.028	.096	.029	.446**	.184	.878**	1.000			
13. PCscore	.315**	-.143	-.120	.160	.230*	.238**	.280**	.167	.301**	.047	.873**	.621**	1.000		
14. CCscore	.300**	-.113	-.116	.130	.134	.348**	.186*	.180	.278**	-.011	.709**	.494**	.585**	1.000	
15. NPscore	.182	-.229*	-.147	.064	-.067	.133	.198*	.082	.445**	.129	.875**	.718**	.658**	.574**	1.000

*Note.* Correlations using Pearson's *r*. BSN = Trained at Bachelor of Science in Nursing and Master of Science in Nursing levels. Cap = precepted capstone student. NGN = precepted new graduate nurse. Exp = precepted experienced nurse. SCscore = Student-Centeredness score. PCscore = Pedagogic Competence score. CCscore = Clinical Competence score. NPscore = Nurse Professionalism score.

\*  $p < 0.05$  (2-tailed). \*\*  $p < 0.01$  (2-tailed).

Correlations performed between demographic variables tended to be insignificant. For those that were significant, they tended to represent small to medium effect sizes ( $\pm .10$  to  $< \pm .50$ ) based on Cohen's criteria (Cohen, 1988 by Hatcher, 2013), ranging from .19 to -.47. Variables with higher correlations and large effect sizes, were between ADN nursing education and BSN nursing education  $-.60$  ( $p < .000$ ), when considering each separately and not combining BSN and MSN (Table 4.10).

**Table 4.10**

*Correlations Between Levels of Education*

	ADN	BSN	MSN
ADN	1	-.603**	-.108
BSN	-.603**	1	-.473**
MSN	-.108	-.473**	1

*Note.* ADN = Associate Degree in Nursing. BSN = Bachelor of Science in Nursing. MSN = Master of Science in Nursing. Correlations with Pearson's  $r$ .

\*\* $p < .01$

Correlations between demographic data and total scores and subscale scores indicated level of *enjoyment* precepting had significant positive correlations with all scores ranging from .28 – .45. There were significant positive correlations between *years as RN* and having precepted *Cap*, *NGN*, and *Exp* as well as having preceptor training ranging from .20 – .38.

There were also significant positive correlations between having preceptor training and having precepted *Cap*, *NGN*, and *Exp*, from .32 – .30; similar, moderate effect sizes. Correlations also impact the regression statistic. If two variables are more highly correlated, their unique contribution to the regression equation is difficult to obtain (Field, 2018). For this reason, variables with higher correlations were not both included in the regression model; *Years as RN* and *age* had a correlation of .74 and *BSN* with *ADN* was -.60. It was decided to only include *Years as RN* and *BSN+* as predictor variables in the following regressions.

### ***Regressions***

Regressions were calculated between independent/predictor variables and the dependent/criterion variables (Cap-ExPresS total score and subscale scores), with  $\alpha = .05$  and a 95% confidence interval (Hatcher, 2013). The total score and subscale scores were used separately as the dependent variable; each calculated as the mean participant's score for the 22-item scale.

**Assumptions.** Assumptions of multiple regression were made on the test data to confirm appropriateness of the data for regression analyses. Data were tested for assumptions of linearity, collinearity, residuals being independent, homoscedasticity, normality, and influence of outliers. The criteria used were scatterplots of the independent and dependent variables to test linearity; VIP scores below 10 and tolerance scores above 0.2 were used for collinearity; Durbin-Watson values close to 2 or between 1 and 3 tested residuals being independent or uncorrelated; demonstrating a random plot of values, not a funnel shape for homoscedasticity; residuals were plotted using a P-P plot for the model to test normality; and

Cook's Distance statistic tested for outliers. The model was found to meet all assumptions for multiple regression.

**Hierarchical multiple regression.** Hierarchical multiple regression allowed the addition of variables based on the following hypotheses suggested by the literature and preceptor experience: (a) the length of time as an RN (*years as RN*) may be a confounding variable and should be held constant (Block 1), (b) variables of *BSN+* and *Caucasian* were added together as they represented demographics of interest and represented the majority of participants (Block 2), and (c) variables representing preceptor experiences supported by SET were added in Block 3 including *training*, *Cap*, *NGN*, *Exp*, *enjoyment*, and *volunteered*. Regressions were run with the mean total score of the Cap-ExPresS (*total score*) then with each mean subscale score as the dependent/criterion variable, separately. Adding variables in steps allowed investigation of the incremental variance when adding blocks of variables (Hatcher, 2013). For hierarchical regression, Field (2018) encourages adding blocks of variables in order based on their importance to the outcome, from most important to least important. However, Hatcher (2013) describes the use of regression to separate or hold constant the impact of a variable. In this case, adding *years as RN* first allowed identification of its unique impact on scores; adding *BSN+* and *Caucasian* next allowed separating their unique impact on scores.

Through the process of hierarchical multiple regression, the direction, significance, and strength of the relationships between predictor variables and criterion variables of preceptor preparedness were demonstrated and equations of best fit identified. Results for total scores as the dependent variable follow. The incremental change in  $R^2$  statistic ( $\Delta R^2$ )

indicates the variance in the dependent variable caused by the variables added at that step while holding other variables constant (Hatcher, 2013). For Block 1 containing only the *years as RN* variable, the  $\Delta R^2$  represented 6.5% of the variance in mean *total scores* and was found significant using the F-statistic:  $F(1, 116) = 8.06, p = .005$ . According to Cohen (Hatcher, 2013), this represents a small effect size. Block 2 included *Caucasian* and *BSN+* with the resulting unique  $\Delta R^2$  statistic representing 4.7% of the variance in mean *total scores* but did not demonstrate significance for  $\Delta R^2$  with  $F(2, 114) = 3.01, p = .053 (p < .05)$ . The unique  $\Delta R^2$  for Block 3 when adding *enjoyment, Cap, Exp, NGN, volunteered, and training* variables, while holding *years as RN, Caucasian, and BSN+* variables constant, represented 25% variance of *total score*, with demonstrated significance  $F(6, 108) = 5.18, p < .000$ . The F-statistic ( $f^2$ ) can be used as a criterion for effect size of  $\Delta R^2$  (Hatcher, 2013) and is computed by the formula,  $f^2 = \Delta R^2 / 1 - R^2$ . For Block 3, this calculation of  $f^2$  using  $R^2 = 20\%$  results in  $f^2 = 0.27$  and is considered a medium effect size using criteria offered by Cohen since there are no similar studies with comparable  $f^2$  statistics (Hatcher, 2013) [Table 4.11].

**Table 4.11***Hierarchical Linear Regression of Independent Variables and Total Scores*

Variable	Block 1		Block 2		Block 3	
	<i>B (SE)</i>	$\beta$	<i>B (SE)</i>	$\beta$	<i>B (SE)</i>	$\beta$
(Constant)	5.10 (0.08) ***		5.70 (0.27)***		3.98 (0.42)***	
<i>Yrs as RN</i>	0.01 (0.01) **	0.26	0.01 (0.01)*	0.23	0.01 (0.01)	0.16
<i>Caucasian</i>			-0.51 (0.22)*	-0.20	-0.33 (0.21)	-0.13
<i>BSN+</i>			-0.11 (0.14)	-0.07	-0.18 (0.13)	-0.12
<i>Cap</i>					0.06 (0.13)	0.04
<i>NGN</i>					0.24 (0.14)	0.16
<i>Exp</i>					0.12 (0.11)	0.10
<i>Training</i>					-0.11 (0.12)	-0.09
<i>Enjoyment</i>					0.02 (0.00)***	0.42
<i>Volunteered</i>					0.04 (0.10)	0.04
<i>Adjusted R<sup>2</sup></i>	0.06		0.08		0.25	
<i>F (df1, df2)</i>	8.04 (1, 116) **		2.75 (2,114)		5.18 (6, 108)***	

Note.  $N = 118$ . BSN+ = Trained at combined Bachelor of Science in Nursing and Master of Science in Nursing levels. Cap = precepted capstone student. NGN = precepted new graduate nurse. Exp = precepted experienced nurse.

Block 2:  $\Delta R^2 = 0.04$ ,  $F(3, 114) = 4.60^{**}$ . Block 3:  $\Delta R^2 = 0.20$ ,  $F(9, 108) = 5.32^{***}$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

The variables with demonstrated significance were used to create an equation of model fit using B weights or unstandardized regression coefficients. These coefficients use the units of measure rather than standardizations of each. For the predictor variables included in the final model for Total Score, demonstrated B weights (unstandardized coefficients) significantly different than zero ( $p < 0.1$ ) included the variable of enjoyment  $B = 0.02 (0.00)$ . The model fit equation for total score was  $total\ score = 3.98 + 0.02 (Enjoyment)$ . These

results indicated that for each one unit increase in enjoyment, there was a 0.02 increase in total score.

Using standardized coefficients ( $\beta$ ), the equation would be  $total\ score = 3.98 + 0.42$  (Enjoyment), showing a large effect size on scores for the level of enjoyment a preceptor has when precepting (Hatcher, 2013); for every increase of one standard deviation (SD) in enjoyment, there is a 0.42 SD increase in total score.

Hierarchical regression tables and interpretation related to predictor variables for subscale scores follow (Tables 4.12 – 4.15). In each regression, the same variables were added using the same steps, and replacing the dependent variable with each mean subscale score. The variable of Enjoyment was the most consistent predictor of mean scores on the Cap-ExPresS total score and subscale scores.

**Table 4.12***Hierarchical Linear Regression of Independent Variables and SC Scores*

Variable	Block 1		Block 2		Block 3	
	<i>B (SE)</i>	$\beta$	<i>B (SE)</i>	$\beta$	<i>B (SE)</i>	$\beta$
(Constant)	5.32 (0.08) ***		5.91 (0.29) ***		4.44 (0.45) ***	
<i>Yrs as RN</i>	0.01 (0.01)	0.12	0.01 (0.01)	0.10	0.00 (0.01)	0.08
<i>Caucasian</i>			-0.53 (0.24)*	-0.21	-0.40 (0.23)	-0.15
<i>BSN+</i>			-0.09 (0.15)	-0.06	-0.17 (0.14)	-0.11
<i>Cap</i>					0.01 (0.14)	0.00
<i>NGN</i>					0.06 (0.15)	0.04
<i>Exp</i>					0.06 (0.12)	0.05
<i>Training</i>					-0.11 (0.14)	-0.08
<i>Enjoyment</i>					0.02 (0.00) ***	0.40
<i>Volunteered</i>					0.11 (0.11)	0.09
<i>Adjusted R2</i>	0.01		0.03		0.18	
<i>F (df1, df2)</i>	1.67 (1, 116)		2.56 (2, 114)		4.33 (6, 108) **	

Note.  $N = 118$ . SC = Student-Centeredness. BSN = Trained at Bachelor of Science in Nursing and/or Master of Science in Nursing levels. Cap = precepted capstone student. NGN = precepted new graduate nurse. Exp = precepted experienced nurse.

Block 2:  $\Delta R^2 = 0.04$ ,  $F(3, 114) = 2.24$ . Block 3:  $\Delta R^2 = 0.18$ ,  $F(9, 108) = 3.78$ \*\*\*.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

An assessment of Block 3 demonstrated Student-Centeredness scores were significantly predicted by Enjoyment. The incremental variance ( $\Delta R^2$ ) for variables added in Block 3 was 18%. For each SD increase in *enjoyment*, the mean Student-Centeredness score increased by 0.40 SDs, having a very similar impact as on the *total score*. No other variables demonstrated a significant impact on mean Student-Centeredness scores.

**Table 4.13***Hierarchical Linear Regression of Independent Variables and PC Scores*

Variable	Block 1		Block 2		Block 3	
	<i>B (SE)</i>	$\beta$	<i>B (SE)</i>	$\beta$	<i>B (SE)</i>	$\beta$
(Constant)	4.80 (0.10)***		5.37 (0.37)***		3.42 (0.59)***	
<i>Yrs as RN</i>	0.02 (0.01)*	0.31	0.02 (0.01)**	0.29	0.01 (0.01)	0.18
<i>Caucasian</i>			-0.45 (0.30)	- 0.13	-0.24 (0.30)	-0.07
<i>BSN</i>			-0.14 (0.19)	- 0.07	-0.21 (0.18)	-0.10
<i>Cap</i>					0.34 (0.18)	0.17
<i>NGN</i>					0.38 (0.19)	0.18
<i>Exp</i>					0.21 (0.16)	0.13
<i>Training</i>					-0.16 (0.18)	-0.09
<i>Enjoyment</i>					0.02 (0.01)**	0.29
<i>Volunteered</i>					-0.01 (0.15)	0.00
<i>Adjusted R<sup>2</sup></i>	0.09		0.09		0.20	
<i>F (df1, df2)</i>	12.53 (1, 116)**		1.30 (2,114)		3.44 (6, 108)**	

*Note.*  $N = 118$ . PC = Pedagogic Competence. BSN = Trained at combined Bachelor of Science in Nursing and Master of Science in Nursing levels. Cap = precepted capstone student. NGN = precepted new graduate nurse. Exp = precepted experienced nurse.

Block 2:  $\Delta R^2 = 0.02$ ,  $F(3, 114) = 5.05^{**}$ . Block 3:  $\Delta R^2 = 0.14$ ,  $F(9, 108) = 4.19^{***}$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$

Block 3 demonstrated Pedagogic Competence scores were significantly predicted by Years as RN and Enjoyment. The  $\Delta R^2$  for all variables added in Block 3 demonstrated 14% of the variance was explained by these variables. Using  $\beta$  weights, a SD increase in *enjoyment* led to a 0.29 SD increase in Pedagogic Competence scores, with a SD increase in *Years as RN* led to a 0.26 SD increase in Pedagogic Competence scores.

**Table 4.14***Hierarchical Linear Regression of Independent Variables and CC Scores*

Variable	Block 1		Block 2		Block 3	
	<i>B (SE)</i>	$\beta$	<i>B (SE)</i>	$\beta$	<i>B (SE)</i>	$\beta$
(Constant)	5.16 (0.08) ***		5.38 (0.31)***		3.62 (0.48)***	
<i>Yrs as RN</i>	0.02 (0.01) **	0.30	0.02 (0.01)**	0.30	0.01 (0.01)*	0.23
<i>Caucasian</i>			-0.26 (0.25)	-0.09	-0.03 (0.24)	-0.01
<i>BSNMSN</i>			-0.03 (0.15)	0.02	0.01 (0.14)	0.01
<i>Cap</i>					0.11 (0.15)	0.07
<i>NGN</i>					0.58 (0.16)***	0.35
<i>Exp</i>					-0.04 (0.13)	-0.03
<i>Training</i>					-0.09 (0.14)	-0.06
<i>Enjoyment</i>					0.01 (0.00)**	0.32
<i>Volunteered</i>					-0.09 (0.12)	-0.07
<i>Adjusted R2</i>	0.08		0.07		0.21	
<i>F (df1, df2)</i>	11.21 (1, 116)**		0.61 (2,114)		4.27 (6, 108)**	

Note.  $N = 118$ . CC = Clinical Competence. BSN = Trained at combined Bachelor of Science in Nursing and Master of Science in Nursing levels. Cap = precepted capstone student. NGN = precepted new graduate nurse. Exp = precepted experienced nurse.

Block 2:  $\Delta R^2 = 0.01$ ,  $F(3, 114) = 4.11^{**}$ . Block 3:  $\Delta R^2 = 0.17$ ,  $F(9, 108) = 4.45^{***}$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

For Clinical Competence scores, Block 3 demonstrated three significant predictor variables. The  $\Delta R^2$  for all variables added in Block 3 was 17% when holding other variables constant. Using  $\beta$  weights, a *SD* increase in *enjoyment* leads to a 0.32 *SD* increase in Clinical Competence scores, with a *SD* increase in *Years as RN* leading to a 0.23 *SD* increase in Clinical Competence scores, a *SD* increase in having precepted a *NGN* led to a 0.35 *SD*

increase in Clinical Competence scores. A more experienced RN who enjoys precepting and precepted a NGN was more likely to score higher on Clinical Competence.

**Table 4.15**

*Hierarchical Linear Regression of Independent Variables and NP Scores*

Variable	Block 1		Block 2		Block 3	
	<i>B (SE)</i>	$\beta$	<i>B (SE)</i>	$\beta$	<i>B (SE)</i>	$\beta$
(Constant)	5.08 (0.09) ***		5.93 (0.33)***		4.33 (0.55)***	
<i>Yrs as RN</i>	0.01 (0.01)	0.18	0.01 (0.01)	0.14	0.01 (0.01)	0.19
<i>Caucasian</i>			-0.70 (0.27)*	-0.23	-0.52 (0.25)	-0.17
<i>BSN</i>			-0.19 (0.17)	-0.11	-0.28 (0.15)	-0.15
<i>Cap</i>					-0.20 (0.15)	-0.11
<i>NGN</i>					0.19 (0.17)	0.11
<i>Exp</i>					0.18 (0.14)	0.12
<i>Training</i>					-0.08 (0.15)	-0.05
<i>Enjoyment</i>					0.02 (0.00)***	0.41
<i>Volunteered</i>					0.07 (0.13)	0.05
<i>Adjusted R2</i>	0.02		0.07		0.24	
<i>F (df1, df2)</i>	3.74 (1, 116)		3.66 (2,114)*		5.46 (6, 108)***	

*Note.*  $N = 118$ . NP = Nurse Professionalism. BSN = Trained at combined Bachelor of Science in Nursing and Master of Science in Nursing levels. Cap = precepted capstone student. NGN = precepted new graduate nurse. Exp = precepted experienced nurse.

Block 2:  $\Delta R^2 = 0.06$ ,  $F(3, 114) = 3.74^*$ . Block 3:  $\Delta R^2 = 0.21$ ,  $F(9, 108) = 5.18^{***}$ .

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$

For Nurse Professionalism scores, Block 3 demonstrated significant predictor variable representing 24% combined variance for Nurse Professionalism scores. The  $\Delta R^2$  for all variables added in Block 3 was 21% while holding other variables constant. Using  $\beta$  weights,

a *SD* increase in *enjoyment* led to a 0.41 *SD* increase in Nurse Professionalism scores.

Enjoyment precepting predicted higher Nurse Professionalism scores.

## CHAPTER 5

### DISCUSSION

Preceptors are a vital part of nursing education. There are currently no instruments measuring preceptor preparedness for the preceptor of undergraduate nursing students in their final clinical experience, their capstone. The purpose of this instrument development research study was to test the validity and reliability of the Cap-ExPresS, a new instrument measuring preceptor preparedness initially developed during a pilot study in 2020. This chapter will focus on the findings of this research study and address the implications based on each of its specific aims and research questions. Limitations of the study will be identified. Implications for use of the Cap-ExPresS for preceptors, educators, and stakeholders (hiring organizations and academic institutions) will be discussed, with future research suggested.

#### **Demographics and Sample Characteristics**

##### **Sample**

The sample included clinical nurses from four hospitals in three states in the midwestern section of the U.S. Of the total 224 clinical nurses returning the survey, 70 self-reported ineligibility, meaning they either were not an RN, were not providing direct patient care, or had not or did not intend to precept a capstone student. There were no consistencies or associations recognized as to why the other participants did not complete the survey. Participants leaving > 10% of responses blank were removed leaving 118 (52.7%) who completed the surveys. DeVellis (2017) and Costello and Osborne (2005) recommend between 5 – 10 (average of 7.5) participants per item, thus this study was developed with a

plan for 502 subjects for the 67-item survey ( $7.5 \times 67 = 502$ ). Because the review of research demonstrated two subjects per item had been used previously to support EFA (Costello & Osborne, 2005), it was decided to continue with plans to perform an EFA with  $N = 118$  participants. This lower number may reflect the fact that two hospitals were not available to participate. In addition, the continued Covid-19 pandemic may have led to a decrease in the numbers of students allowed for capstones, decreasing the number of preceptors working with or planning to work with capstone students, and decreasing the number of preceptors available to participate in the survey. The site contacts requested to reach contact participants themselves which may have limited the sample size as no additional marketing by researchers was permitted (ie. placing posters or visiting sites to encourage participation).

### **Demographics**

Most clinical nurses in this sample were Caucasian with a BSN degree averaging about 40 years of age with 12 years of RN experience. For both the pilot study and the current study, the percentages of Caucasian and BSN prepared nurses were higher than the general U.S. RN population. Because the sample of the pilot study and this study are more similar, it may suggest there is a demographic specific to the preceptor population and possibly even to the preceptor of the nursing capstone student, particularly in the Midwest. The preceptors in this sample tended to be younger, more highly educated, and more often Caucasian. A younger preceptor may relate more easily to the student. Often, new clinical nurses are asked to precept a capstone student as their first precepting experience, “to see how they do as a preceptor” (personal communication, E. B., October 11, 2021). In this sample, newer nurses tended to be younger as demonstrated by a correlation of .74 between

age and years of experience. The high numbers of BSN prepared nurse preceptors align with initiatives by organizations such as the American Association of Colleges of Nursing (2019c) which has recognized the BSN as the entry level of education for professional nurses since 1996 (<https://www.aacnnursing.org/news-information/position-statements-white-papers/bacc-degree-prep>). In addition, for this sample, two of the hospitals were Magnet, and Magnet designation requires demonstrated increases in numbers of BSN prepared nurses (<https://www.nursingworld.org/organizational-programs/>).

The focus on diversity and the racial under-representation within nursing seen in the current media is a concern within healthcare. The ethnic makeup of RNs in general as well as for this sample of preceptors demonstrates a lack of racial diversity. The United States Census Bureau (<https://www.census.gov/library/stories/2021/08/2020-united-states-population-more-racially-ethnically-diverse-than-2010.html>) used the Diversity Index (DI) to measure changes in diversity from 2010 to 2020; DI is a measure of the chance that two people chosen at random would represent different races and was used to compare 2010 and 2020 race/ethnicity census data. The DI increased from 54.9% to 61.1%, demonstrating a 6.2% increase in diversity in the U.S. during this decade. Kendrick et al. (2020) reported in their study of  $N = 65$  underrepresented minority high school juniors in Maryland, participating in a health careers course, that ethnic concordance with preceptors was a predictor of viewing the preceptor as a role model. It is their argument that increased diversity in the healthcare workforce provides more preferred role models and could potentially increase the diversity of future healthcare workers by encouraging these racially diverse high school students to want to work in healthcare. The process of matching

preceptor and student to support concordance of race or ethnicity was not seen in the preceptor literature.

### **Precepting Experiences: Self-Efficacy as a Framework**

Self-Efficacy theoretical framework recognizes four ways preceptors change their level of preparedness, through: (a) personal experiences precepting, (b) vicarious precepting experiences, (c) persuasion, and (d) emotional or physiological responses to precepting.

Preceptors in this study indicated a high level of enjoyment precepting capstone students or considering precepting capstone students, a positive emotional response to precepting with a mean of 81.7 from a reported range of 40-100. This aligns with the inclusion of the importance of emotional responses to preceptor self-efficacy (Bandura, 1997); a positive response leading to increased preceptor preparedness. Even though preceptors said they enjoy precepting, it was interesting that 55 (42.1%) were assigned and 49 (41.5%) volunteered for the role of precepting a capstone student. This similarity may indicate preceptors do not always look for precepting opportunities even though they usually enjoy them.

Preceptors indicated not feeling prepared for the role (Kennedy, 2019) even after training. Most preceptors received preceptor education that was mandatory, in-person, and provided by their own organization. Preceptors have indicated they want training and support from their organization (Dibert & Goldenberg, 1995; Horton et al., 2015; Hugo et al., 2018). The fact that preceptors are assigned, and the courses are mandated does not equate with preceptors not wanting to take the courses or not wanting to precept. Instead, some organizations call the course mandatory because it is tied to additional preceptor pay (personal communication, J. W., June 2020).

In addition to training and additional pay, other supports or means of persuasion at an organizational level may include meaningful recognition or protected precepting time (Dibert & Goldenberg, 1995; Hugo et al., 2018). Persuasion is identified as a means of increasing self-efficacy in general (Bandura, 1997), and preceptor preparedness specifically, based on the results of this study.

This study supported that many preceptors are sometimes called upon to precept without having received any training; 23 of the 29 (19.7% of the total number of preceptors) preceptors who reported not having any training still precepted. This is a smaller percent than Tuomikoski et al.'s (2018) Finnish study which indicated 61% of their  $N = 576$  preceptors had not received training. These results demonstrate an opportunity in providing preceptor training. Six preceptors in this study indicated receiving college level training in precepting while 14 reported receiving an MSN. This study did not ask if preceptors received training from the capstone students' schools themselves or if the reported college training was part of an advanced degree curriculum. An interesting question for future study would be the role of faculty and academic partners in training preceptors for their role as a capstone preceptor. This may be important as preceptors did partially take the place of clinical faculty in the 1980's and are now an integral part of the school curriculum to prepare nursing students as novice, generalist nurses (AACN, 2020; Myrick, 1991; Shamian & Inhaber, 1985).

As discussed in preceding chapters, SET as a guiding framework indicated that experience in precepting leads to changes in levels of preceptor preparedness. The survey questions related to preceptor experiences included measuring who was being precepted (*Cap*, *NGN*, or *Exp*) as well as how many times each type of preceptee was precepted (0 – 3,

or > 3). This study showed participants often precepted multiple types of preceptees, *Cap* and/or *NGN* and/or *Exp*. For example, Hospital A preceptors reported 24% having precepted *Cap* more than 3 times, 56% precepted *NGN* more than three times, and 49% precepted *Exp* more than three times; only two of these respondents precepted just one type of preceptee. Such varied experiences may support increases in Cap-ExPresS scores. However, it does make it difficult to measure the unique influence of precepting *Cap*.

Preceptor training often includes opportunities to reflect on personal experiences and receive feedback from fellow participants or instructors related to precepting (Bengtsson & Carlson, 2015; Myrick et al., 2012), supporting both persuasion and vicarious learning. In addition, managers/educators of preceptors may impact preceptor confidence by the process of being chosen (Cotter et al., 2018). Preceptor selection to work with *NGN* or *Exp*, followed by performance evaluations provides feedback leading to increased preceptor preparedness (Cotter et al., 2018).

SET has been shown as an appropriate framework to predict and support the development of preceptor preparedness. The Cap-ExPresS measures a preceptor's self-perceived level of confidence in performing certain precepting behaviors. Supported by SET, personal experiences of precepting, vicarious experiences of observing peer preceptors or through training activities, various persuasive experiences such as being selected or receiving supportive feedback, and emotional responses to precepting may all impact preceptor preparedness scores. Measuring preceptor preparedness using the Cap-ExPresS could allow further evaluation of the effectiveness of these theoretical methods of increasing preceptor

preparedness. Educators in the clinical and academic settings could both use Cap-ExPresS scores to better understand the preceptor of the capstone student.

### **Specific Aims and Research Questions**

Psychological tests can measure latent or unseen variables (Furr, 2018) such as preceptor preparedness. 2017). Psychometric research supports the development and testing of instruments created to measure latent variables such as preceptor preparedness. In particular, psychometric testing supports evaluating the content, reliability, and validity of an assessment tool such as the Cap-ExPresS. EFA supports the construct validity of the scale, usually during the early phases of its development. An EFA evaluates correlations or interrelationships among items and clusters items into factors (Furr, 20182017) to identify the dimensionality of the scale. EFA, correlations, and regressions between variables were used to address the aims and research questions of this study.

#### **Aim 1**

The first aim of this study was to explore the construct validity of the Cap-ExPresS using EFA and item reduction analyses, identifying the preceptor preparedness of our sample as measured by the Cap-ExPresS. The research question being asked to meet this aim was “What is the factor structure of preceptor preparedness as identified through EFA, second-order EFA, and item reduction analysis of the survey responses?”

#### ***Exploratory Factor Analysis***

Sampling adequacy was determined by KMO as “marvelous” (Howard 2016), and Bartlett’s Test of sphericity was significant indicating the inter-item correlation matrix was not an identity matrix, both supporting the suitability of the test data for EFA. Multiple

methods determined the number of factors to extract. Using eigenvalues, visual scree plot, and percent variance explained, four factors were extracted. This was confirmed by evaluating a 1-factor, 3-factor, and 5-factor scale which did not support the content validity of the scale. The content validity was referenced throughout the decision-making processes involved in EFA, including evaluation of communalities and correlations. Iterative EFAs were performed after items were removed, evaluating if items continued to cluster or load on the four factors as anticipated. Each item considered for removal was evaluated for its importance to the meaning of the scale and to its structure. The final scale had 22 items loading on four factors as hypothesized a priori from the literature and identified through the pilot study.

### ***Second-Order EFA***

Using an oblique rotation during the EFA created a factor correlation matrix (Arnau, 1998). This matrix demonstrated correlations between the factors supporting the use of second-order EFA (Marszalek et al., 2017). This factor matrix was evaluated by KMO and Bartlett tests, demonstrating sampling adequacy and sphericity. The eigenvalues, VSP, and variance explained all supported a one-factor solution. These results supported the use of a total test score in addition to the subscale scores for this instrument. Therefore, measurements of the total Cap-ExPresS score can be provided for overall preceptor preparedness, while the subscale scores can demonstrate factor scores: levels of confidence in areas of Student-Centeredness, Pedagogic Competence, Clinical Competence, or Nurse Professionalism. During the testing of alternative models during EFA, the one-factor solution was also found viable. However, it had 4 factors with eigenvalues  $>1$ , and did not align with

the a priori four-factor model. Also, one of the goals of creating this instrument was to use it for self-assessment of preceptor preparedness, or as a needs assessment by educators. This would benefit from having the four-factor model to identify specific areas on which to focus training and development rather than preceptor preparedness in general.

## **Aim 2**

The second aim was to evaluate the reliability of the Cap-ExPresS by answering the research question of “What is the internal consistency reliability and the test-retest reliability of the Cap-ExPresS?” Tests of internal consistency reliability were performed using Cronbach’s alpha and *alpha if item removed*, while test-retest reliability was evaluated by comparisons of Pearson’s *r* correlations between test and retest scores.

### ***Internal Consistency Reliability***

The test for internal consistency reliability was computed with Cronbach’s alpha. Alpha for the total score, Student-Centeredness score (SC score), Pedagogic Competence score (PC score), Clinical Competence score (CC score), and Nurse Professionalism score (NP score) were strong at 0.95, 0.90, 0.90, 0.81, and 0.87 consecutively. These scores indicated each set of items represents the dimension or construct of interest it is meant to measure. No items were found to increase alpha if removed, indicating the 22-item scale had high internal consistency reliability. This is often the only reliability test seen when evaluating test reliability. It was determined to also use test-retest reliability to further evaluate this instrument.

### ***Test-Retest Reliability***

The test-retest sample included 23 sets of matching data, an adequate number based on similar studies (Caruso et al., 2016; Cheraghi et al., 2009). Correlations between total scores and subscale scores were performed between the test and retest using Pearson's  $r$ . The results were evaluated using the scale below (Table 4.8). Results indicated all scores were significant and *CC scores* demonstrated acceptable reliability with a Pearson's  $r$  of 0.77 between the test and retest; the *total scores* ( $r = 0.61$ ) and NP scores ( $r = 0.61$ ) demonstrated questionable reliability. The *PC scores* ( $r = 0.58$ ) demonstrated poor reliability and *SC scores* ( $r = 0.49$ ) had reliability that was unacceptable. While the results were not consistent across all scores, there was partial demonstrated reliability for this instrument. These results may be due to the small sample size. A two-week timeframe between the test and retest as demonstrated in two studies of instruments measuring self-efficacy (Caruso et al., 2016; Cheraghi et al., 2009) may be preferred. For this study, there was a four-week interval between tests, but four weeks were also allowed for completing each survey therefore, there may have been as long as 12 weeks between tests.

There are risks identified for the test-retest method of testing reliability, including experiences that may impact scores. For example, in this study 5 of the 23 participants reported they had received preceptor training or had precepted before providing the retest responses. The timing of this study may have potentiated the risk of contamination, as the summer is a busy time for hiring new graduate nurses and 18 (78%) preceptors indicated they had precepted between tests. Another consideration is that self-perception of confidence may be considered a state rather than a trait, having a greater tendency to change over time. This

could be supported by the *CC scores* being most reliable, as Clinical Competence may not be as changeable as levels of Student-Centeredness which is more affective or subjective in nature.

Combining qualitative methods to further inform Cap-ExPresS scores during a test-retest would provide a deeper understanding of the reasons for changes in scores. Dealing with difficult students or having to fail a student, both examples of activities specific to precepting a capstone student, could be experiences impacting the preceptor's score or level of confidence. Based on SET, actual personal or vicarious experiences, as well as support provided by schools and organizational leadership during such an experience could impact a preceptor's level of self-perceived confidence. The risk of carryover testing effects where participants are influenced by the test, impacting scores on the retest (Polit & Beck, 2017), was also a possibility based on the pilot study. For example, preceptors performing process validity during the pilot were very reflective when reading items, considering if they were performing the various behaviors being tested during their preceptor practice.

### **Aim 3**

The third aim of this study was to explore the correlations and regressions between preceptor demographic and experience variables, and with Cap-ExPresS scores, identifying predictors of Cap-ExPresS scores. The research question supporting this aim was, "What are the correlations and regressions between Cap-ExPresS scores (dependent/outcome variable) and independent/predictor variables of age, race/ethnicity, nursing education received (BSN), type of preceptor training, level of enjoyment, years as RN, volunteered, precepted Capstone

(Cap), precepted new graduate nurse (NGN), and precepted experienced nurse (Exp), including the line of best fit predicting Cap-ExpPresS scores?”

Correlations using Pearson’s  $r$  were performed to better understand the relationships between all independent variables. Effect sizes were evaluated using Cohen’s suggestions (Hacker, 2013) of 0.10 as small effect size, 0.30 as medium, and 0.50 as large.

### ***Correlations Between Independent Variables***

There was a strong positive correlation with large effect size between age and years as an RN (0.74), as might be expected. Since it was not a perfect correlation, it may represent a portion of sample RNs were starting their careers at a later age. There were negative correlations with medium effect size between BSN and MSN (-.47), and negative correlations with large effect size between BSN and ADN (-.60). This may suggest that sample RNs with one of these degrees are less likely to have the other. There has been a push by the Institute of Medicine (2011) and AACN (2019b) to have the BSN as the entry level for RN licensure. This data may question the sustainability of this push as RNs in this study tended not to progress from ADN to BSN.

Positive correlations between demographic variables with medium effect size were identified between preceptors who had received *training* and had precepted *Cap*, *NGN*, and *Exp*; 0.32, 0.39, 0.38, respectively. This supports the importance of training to the preceptor, regardless of the type of preceptee. Preceptors did not just precept a single type of preceptee, seen as a significant, positive correlation with a medium effect size between precepting *NGN* and *Exp* (0.33) and a significant, positive correlation with a small effect size between *Exp* and *Cap* (0.21) was shown in this sample. This may contaminate the data collected for

preceptors of capstone students as the same preceptor tends to precept other types of preceptees as well. In the study sample, only 11 of 118 (9%) preceptors had precepted just one type of preceptee. This may also make it difficult to evaluate or know how to best prepare the preceptor of the capstone student, in general.

### ***Correlations Between Independent Variables and Cap-ExPresS Scores***

While identifying correlations between independent variables and Cap-ExPresS scores was not an initial question for this study, it was decided to perform these correlations to further explore relationships with scores (Table 4.9). Correlations with Cap-ExPresS scores and level of enjoyment precepting a capstone student were found to be significant with medium effect sizes for *total score* (0.44), SC score (0.45), PC score (0.30), and NP score (0.45), and almost a medium effect size for CC score (0.28). This suggests that enjoying precepting is consistent with an increased level of confidence in performing all precepting behaviors.

As this study was evaluating the precepting of capstone students, it was of interest to compare the results for Cap with the other types of preceptees. CC scores were significant with precepting NGN (0.35) and Exp (0.19); PC scores were significant with medium effect size for all types of preceptees; NP scores were significant with Exp (0.20); and Total scores were significant with NGN (0.19) and Exp (0.23). This indicates that preceptors feel more confident in performing clinical competence items when having precepted NGN or Exp. This confidence may be due to precepting experiences aimed at preparing the NGN or Exp to be competent in their new role (Ulrich, 2018) while capstone students are preparing to be novice, generalist nurses and are not expected to be competent at this point (Benner, 1982).

Confidence was similar in performing pedagogic items for all preceptees, which is encouraging. This suggests that education offerings have been successful or that faculty, peers, or leaders have supported preceptors in learning pedagogy. An overall score of confidence increases when precepting NGN and Exp. This calls into question the idea of having new preceptors precept capstone students before precepting other types of more experienced preceptees and validates the need to study how to increase confidence prior to precepting capstone students.

### ***Regression Analyses***

The decision to include tests of regression was made to evaluate the predictors of Cap-ExPresS scores, the dependent or criterion variables. Regressions could also be used to explore the use of SET in predicting preceptor preparedness. *Years as a RN* was entered in Block 1 and held constant as it had significant correlations with all independent variables except *Caucasian*, *enjoyment*, and *volunteered*. Block 2 included *Caucasian* and *BSN+*. These variables were considered stable and had minimal correlations with other predictor variables. The *BSN+* variable was significantly correlated only with *years as a RN*; there were no significant correlations between *Caucasian* and other predictor variables.

Block 3 included the remaining variables of enjoyment, Cap, Exp, NGN, volunteered, and training. Level of enjoyment precepting was found to consistently support increases in all scores. This is consistent with the findings of Li and Su (2015) that being extroverted was associated with increased preceptor self-efficacy and the belief that one could precept and make a difference for those being precepted (Bandura, 1997). Extroverts tended to be more friendly and outgoing, characteristics which align with Student-Centeredness. *Years as RN*

supported PC scores and CC scores with a small effect size. This does support SET in that RN experiences impact preceptor preparedness. Training was not identified as predicting any of the scores of preceptor preparedness while precepting *NGN* increased CC scores. Precepting *NGN* is focused on the development of competence to practice independently, supporting this relationship. Results indicated an inverse relationship between *Caucasian* with NP scores. Looking at total scores, the predictor variables of *enjoyment*, *Cap*, *Exp*, *NGN*, *volunteered*, and *training* while holding *years as RN*, *Caucasian*, and *BSN+* constant explained 20% of the score variance leaving 80% of the variance explained by other variables not included in this regression/study. While these results and interpretations are interesting, their practical significance is questionable based on the small sample size, and it would be considered unsound to make important decisions, such as preceptor selection, based on this data alone.

### **Secondary Aim**

The secondary aim of this study was to identify the overall and domain-specific levels of preceptor preparedness for the test sample as measured with the Cap-ExPresS. The research question for this aim was “What are the Cap-ExPresS scores and the domain-specific scores for this sample of preceptors in total and when divided by site location?” The purpose of this question was to offer participating hospitals feedback about their participants at the aggregate level. Table 5.2 presents mean Cap-ExPresS scores by site.

**Table 5.2***Comparison of Mean Scores Per Site*

	<i>Factors</i>				
	Total Score	SC Score	PC Score	CC Score	NP Score
Total Sample (n = 118)	5.26	5.39	5.07	5.37	5.21
Site A (n = 41)	5.16	5.31	5.01	5.30	5.01
Site B (n = 5)	5.65	5.80	5.73	5.47	5.60
Site C (n = 28)	5.10	5.27	5.11	4.79	5.19
Site D (n = 44)	5.40	5.50	5.55	5.25	5.36
Factor Mean Score*	5.33	5.47	5.35	5.20	5.29

Note. \*Site scores were added for each factor with total divided by 4, and no adjustments for sample size. SC = Student-Centeredness. PC = Pedagogic Competence. CC = Clinical Competence. NP = Nurse Professionalism.

Each site will be provided their mean scores and the total sample scores for comparison purposes. Sites are represented by letters to protect their anonymity. No interpretation is being made for what these scores represent for each organization due to small samples. The purpose was to provide a possible idea of where preceptors felt more or less confident in their role, and potentially offer suggestions for training topics. For example, there were three items representing Clinical Competence which included the following concepts: (a) guide the student to recognize patterns in patient assessments, (b) role model managing a full patient load, (c) offer opportunities to understand patient care across the continuum. Focusing on these concepts might increase Clinical Competence scores.

## **Validity Summary of the Cap-ExPresS**

Items were developed based on the definition and boundaries of preceptor preparedness as identified through literature review and focused ethnography. Content validity of the items and the full instrument were then performed by experts in preceptor training, expert preceptors, and professors with instrument development expertise. Process and face validity were performed by members of the target population. Each were performed during the pilot study and supported the choice of the 109 items representing preceptor preparedness for further psychometric testing.

This study used a 67-item version of the Cap-ExPresS to evaluate construct validity. Construct validity demonstrates the degree to which test scores represent the concept being measured (Furr, 2018). If Cap-ExPresS scores of preceptor preparedness are to be relied upon in making preceptor decisions, there must be strong evidence that the scale actually measures preceptor preparedness. The scale must support the definition and boundaries of preceptor preparedness. During literature review, four dimensions (referred to as factors within EFA) were identified as aspects of preceptor preparedness and labeled as Student-Centeredness, Pedagogic Competence, Clinical Competence, and Nurse Professionalism. Other identified instruments were not adequate as they measured up to three of these dimensions, or the context of the preceptor working with the capstone student was not the context of the instrument. Each of these further strengthened the need for the Cap-ExPresS instrument using its identified definition and boundaries.

Theoretical underpinnings of SET supported the writing of items to include aspects of overcoming barriers, motivators of performing behaviors, and emotional aspects impacting

learning of preceptor preparedness (ie. enjoyment, sense of humor, and feelings of frustration). SET supported measuring levels of preceptor self-perceived confidence to perform precepting behaviors (self-efficacy beliefs) as described by each item. The inclusion of variables of *enjoyment* and *volunteered* were added to support the affective influences important to preceptor preparedness.

Furr (2018) includes content validity as part of construct validity. Let it be said that you cannot have construct validity, where the actual scale structure matches the structure it should possess, until you are confident the actual content of the scale matches the content that should be in the scale (Furr, 2018). In other words, if the items do not represent the construct, there is no content validity, then those same items could not have an accurate structure. This study relied upon the content and construct validity of the pilot study and extracted four factors per EFA; evaluating if the structure of the scale matched the expected content validity and structure of the scale identified in the pilot study.

EFA is commonly used during early stages of psychometric analysis of an instrument. The use of EFA identifies the best items to represent preceptor preparedness according to its factors. During iterations of EFA, it was important to continually go back to content validity and identify if items clustered into factors as expected. Did the items representing clinical competence cluster together during each iteration of EFA, loading on the same factor? If they did, then construct validity was supported, as it was in this study.

## **Reliability Summary of the Cap-ExPresS**

The internal consistency reliability of the Cap-ExPresS scale was supported in this study. Reliability is a product of the number of items and the strength of correlations between items; reliability increases as the number of items increases (DeVellis, 2017). The CC score represented the smallest number of items, having only three items; the CC score also had the lowest alpha. Therefore, the lower reliability of the CC score (0.81) may be partially due to the smaller number of items. All scores demonstrated strong reliability ( $> .80$ ).

The risks to test-retest reliability were found to possibly impact this study as preceptors had experiences between tests that could have changed their responses. The question was raised if performing the retest was beneficial. While there were 175 additional participants that could have been included in the original EFA had they responded to the first survey, the fact that even with this smaller retest sample there was evidence of test-retest reliability is important. The reliability of this study also supported the findings of the pilot study, increasing the strength of these findings and of the Cap-ExPresS as a reliable scale, measuring preceptor preparedness consistently.

## **Limitations**

The first limitation of this study is the sample size. EFA is considered a large sample procedure therefore the small study sample is a limitation. Generalizability of the results is limited due to the sample collected from four U.S. Midwestern hospitals and not representing the RN population in mean age or diversity in race/ethnicity/culture. The younger mean age (39.6 years) and the lack of racial diversity [5 (4.5%) who were not Caucasian] in this study

sample means it was not representative of the general RN population and therefore limits its generalizability.

The instrument's rating scale used 6-levels to diminish equivocation (DeVellis, 2017). While this was deemed important to measuring confidence, often people do have a neutral opinion of something, and this option was not allowed. This may have forced responses that were not representative of how the preceptor perceived themselves or may have led to no response for those questions where the participant preferred the neutral option.

Content validity was performed by experts, but each expert did not complete a scoring of items such as through a content validity index. Instead, content validity was completed over time with various experts. It was iterative as well, where items that were not questioned as being pertinent, representative, or confusing (during process validity), were not evaluated again. This was due to the large number of items, the time constraints of various classes and assignments, and availability of the experts. Content validity was performed using a combination of individual interviews, small workgroups, and through email communication using a content scoring tool increasing its complexity.

The use of mean substitution for missing data was a limitation of the study but was used to maintain the sample size for this smallish sample. Within hierarchical regression, the larger R-square determined for *total scores* was moderate in size and may have been overfit to the data making replication difficult when using a different sample.

This study included an incentive, a monetary gift of appreciation for participants, for both the test and the retest. Upon discussion with the site contacts, two of the organizations did not allow their nurses to receive gift cards (Hospitals B and D). For the other two

organizations, only a fraction of the participants provided the additional information needed to be eligible for a gift card (affirmation of requesting a gift card, first name, and email address); Hospital A, 41.5% for test and 29.3% for retest, and for Hospital C, 42.9% for the test and 12.1% for retest. This may be indicative of several things, that offering an incentive was not coercive; the amount was not sufficient to incentivize participation; or this sample of nurse preceptors is willing to support research for other reasons, possibly because it seems meaningful to them. The time and inconvenience required to request a gift card, or the impression of decreased anonymity may also have prevented requesting a gift card. Of interest, the hospitals that did not allow gift cards (Hospitals B and D) provided 12 and 129 total participants, respectively, for test and retest combined demonstrating not being offered an incentive did not prevent participants from responding. In addition, the monetary amount for the retest was higher and the number of items was smaller, yet the gift card requests after the retest was smaller than the test.

### **Implications for Future Research, Practice, and Policy**

The specific aims of this study were to evaluate the construct validity of the Cap-ExPresS, to evaluate the reliability of the Cap-ExPresS, and to explore the correlations and regressions between independent variables and with Cap-ExPresS scores. The analysis of results supported levels of content validity, construct validity, and reliability for this new instrument, the Cap-ExPresS. The predictability of scores is promising but needs further investigation.

### ***Testing the Scale***

Several ideas for future research can grow from this study. Due to the limitations attributed to small sample size and the lack of diversity, evaluations of the Cap-ExPresS with larger and more diverse samples related to race/ethnicity, gender, age, and educational background would be important to its generalizability. Such studies could have a secondary aim of evaluating the actual demographics of preceptors of capstone students. This information could be used to support synthesis of future studies of preceptors, providing a more accurate standard for generalizability. This scale could support professional development specialists in evaluating preceptor learning needs since preceptor education and selection are part of their scope of practice (Harper & Maloney, 2016). Using this standardized instrument to evaluate preceptor educational interventions would meet the need described by Windey et al. (2015), that there is not enough similarity in studies to support best practices of preceptor education. The goal would be to increase the validity and reliability of the Cap-ExPresS to support best practices in preparing preceptors.

### ***Application to Practice***

Other studies of interest for the future might be to compare results of the Cap-ExPresS for different areas of nursing practice such as ambulatory nursing versus medical-surgical nursing versus critical care nursing. Comparisons of levels of preceptor preparedness in randomized controlled studies using multiple training interventions, provided by both education and clinical practice partners, would help identify best preceptor training practices. These studies would need to have a longitudinal component and include higher levels of evaluation such as the application of training into practice, level 3 of Kirkpatrick's Four-

Level Model of evaluation (Reio et al., 2017). Studies comparing personality types (Li & Su, 2014) and Cap-ExPresS scores could explore the influence of extroversion versus introversion in levels of confidence. Another comparison of interest to organizations would be the influence of various types of preceptor supports (Dibert & Goldenberg, 1995) with Cap-ExPresS scores. Considering the influence of managers on their staff, a question to answer might be, do perceptions of manager caring behaviors (Kostich et al., 2020; Wolverton, 2016), a type of support, impact preceptor preparedness? Each of these could improve preceptor training and support organizational practices and policies.

### ***Support for Preceptor Regulation***

A next level of study would be to correlate the level of preceptor preparedness with student outcomes such as successfully completing capstone, NCLEX scores, or new graduate nurse retention. Identifying the level of preparedness necessary to improve outcomes could support preceptor selection processes or policy for who can precept. Currently, each state has different qualifications or regulations for preceptors (L'Ecuyer et al., 2018). Some are specific and some are minimal, but the evidence supporting them is not always provided. After adequate testing, this instrument could support development of training guidelines for preceptors, or preceptor qualifications at the state level. One question that is not answered in capstone research is how long should the capstone experience be? Studies comparing length of the capstone experience with Cap-ExPresS scores, NCLEX scores, or levels of NGN readiness for practice (Rusch et al., 2019) could influence academic curricula. The survey developed by Rusch et al. (2019) could be included as preceptors are evaluating student readiness for practice at the end of their Capstone experience. Such studies could potentially

be done at the regional level with collaborative groups of academic and clinical practice partners.

### ***Expansion of Preceptor Practice***

Preceptors are not just asked to work with capstone students. For example, in Sweden preceptors are used at earlier levels of clinical learning experiences, and additional preceptor training was recognized as a need (Nygren & Carlson, 2017). Further psychometric testing of the Cap-ExPresS for preceptors of students at all levels of their education would support its validity in measuring preceptors of all types of students. This scale could be provided to preceptors upon assignment to work with a student; preceptor needs could be identified; and supports by both academic and clinical practice partners would be provided to support preceptor preparedness to work with all students. Such studies would also promote collaboration with academic partners and improve the clinical experiences for these students. As students are better prepared, our patients are provided better nursing care.

### **Summary of Research**

The Cap-ExPresS is broadly applicable to preceptor research, from increasing its own validity to supporting changes in state level policy and regulation. At this point, this instrument has demonstrated its validity and reliability with a pilot study for preceptors at an academic medical center in the Midwest and for this sample of preceptors from four different organizations in the Midwest. The next steps would continue to expand to samples outside of the Midwest to increase the generalizability of the scale. The potential of the Cap-ExPresS to improve preceptor preparedness is both practical and meaningful to the current needs as numbers of student enrollment is growing and the faculty shortage continues. Preceptors will

continue to be relied upon to educate not just capstone students but other nursing students as well. It is vital that they receive the support they need via training, organizational supports, and collaborative practices. Continuous evaluation of preceptors and other pertinent outcomes will also be necessary to implement best preceptor preparation practices across the preceptor population.

**APPENDIX A**

**Letters of Support from Participating Hospitals**



2401 Gillham Road  
Kansas City, Missouri 64108  
(816) 234-3000

March 9, 2021

Lisa E. Guthrie  
Ph.D. Student  
leghkh@mail.umkc.edu  
University of Missouri-Kansas City  
Kansas City, Missouri 64080

Dear Lisa,

I am pleased to offer my support for your dissertation study "Instrument Development and Psychometric Testing of the Capstone-Experience Preceptor Preparedness Scale: The Cap-ExPresS Study". As Senior Director of Patient Care Services Research at Children's Mercy – Kansas City, I fully support this study including my willingness to email the study invitation with a survey link to our clinical nurse employees.

The understanding of preceptor preparedness is vital to the quality of training preceptors provide to our nursing students, and thus the preparedness of future nurses in our organization. We look forward to supporting you in your work.

Sincerely,

A handwritten signature in cursive script that reads "Susan F. McElroy".

Susan McElroy  
Senior Director, Patient Care Services Research  
Children's Mercy Hospital

Date: March 9<sup>th</sup>, 2021

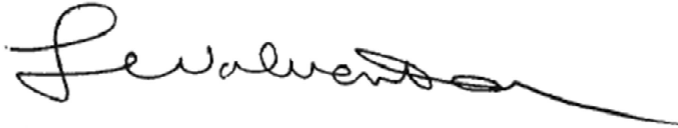
Lisa E. Guthrie  
Ph.D. Student  
legkh@mail.umkc.edu  
University of Missouri-Kansas City  
Kansas City, Missouri 64080

Dear Lisa,

I am pleased to offer my support for your dissertation study "Instrument Development and Psychometric Testing of the Capstone-Experience Preceptor Preparedness Scale: The Cap-ExPresS Study". As Director of Critical Care Services at Franciscan St. Francis Health I fully support this study including sending the questionnaire to our clinical nurse employees and providing guidance and direction in psychometric testing of this instrument.

The understanding of preceptor preparedness is vital to the quality of training preceptors provide to our nursing students, and thus the preparedness of future nurses in our organization. We look forward to supporting you in your work.

Sincerely,



Cheryl Wolverson PhD, RN, NEA-BC  
[Cheryl.Wolverson@franciscanalliance.org](mailto:Cheryl.Wolverson@franciscanalliance.org)  
Director Critical Care Services  
Franciscan Health  
8111 South Emerson Avenue  
Indianapolis, IN 46237



March 9, 2021

Lisa E. Guthrie  
Ph.D. Student  
legkh@mail.umkc.edu  
University of Missouri-Kansas City  
Kansas City, Missouri 64080

Dear Lisa,

I am pleased to offer my support for your dissertation study "Instrument Development and Psychometric Testing of the Capstone-Experience Preceptor Preparedness Scale: The Cap-ExPresS Study". As CNO at Providence Medical Center I fully support this study including sending the questionnaire to the clinical nurses employed at Providence Medical Center.

The understanding of preceptor preparedness is vital to the quality of training preceptors provide to our nursing students, and thus the preparedness of future nurses in our organization. We look forward to supporting you in your work.

Sincerely,

Jennifer Cannon, RN, BSN, MBA, PCCN-K  
Chief Nursing Officer  
Providence Medical Center



2800 Clay Edwards Drive  
North Kansas City, MO  
64116-3281

March 1, 2021

Lisa E. Guthrie  
Ph.D. Student  
University of Missouri-Kansas City  
Kansas City, Missouri 64080

Dear Lisa,

I am pleased to offer my support for your dissertation study "Psychometric Testing of Capstone-Experience Preceptor Preparedness Scale- The Cap-ExPresS Study". As the Senior Director of Clinical Excellence & Nursing Professional Development at North Kansas City Hospital, I fully support this study including sending the questionnaire to our clinical nurse employees.

The understanding of preceptor preparedness is vital to the quality of training preceptors provide to our nursing students, and thus the preparedness of future nurses in our organization. We look forward to supporting you in your work.

Sincerely,

A handwritten signature in cursive script that reads "Ashley Peacock" followed by the date "3/1/21".

Ashley Peacock, MSN RN NPD-BC NEA-BC  
Senior Director, Clinical Excellence &  
Nursing Professional Development  
North Kansas City Hospital



October 26, 2021

To Sigma Theta Tau International:

I am very pleased to offer my strong support for Lisa Guthrie's grant proposal titled: "Instrument Development and Psychometric Testing of the Capstone-Experience Preceptor Preparedness Scale: The Cap-ExPresS Study."

Current measurement tools do not measure self-perceived preparedness for preceptors of pre-licensure nursing students. Although existing tools assist managers in evaluating preceptors for new graduate nurses and capstone students, they don't adequately measure precepting ability from the preceptor's perspective. To date, there is no valid instrument fully measuring preceptor preparedness as described in Lisa's study, specifically for precepting capstone students.

The specific aims of Lisa's study are to evaluate the internal consistency reliability of the preceptor preparedness scale, evaluate the correlations and regressions between scale items and preceptor demographics and status, identify the factors of the construct of preceptor preparedness through exploratory factor analysis, and finalize the Cap-ExPresS. A secondary aim of her study is to identify overall and domain-specific levels of preceptor preparedness of the sample as a whole and when separated by organization.

I have contacted the Chief Nursing Officers for the two Saint Luke's entities (Saint Luke's Hospital of Kansas City and Saint Luke's East) that Lisa's study would target, who have expressed interest in participating.

Again, I enthusiastically support this well-designed validation study of an instrument that holds great promise for fully measuring preceptor preparedness for pre-licensure nursing capstone students.

Warmest regards,

*Jacque Carpenter*

Jacque Carpenter PhD, RN, CCRP  
Nursing Research Program Director, Saint Luke's Health System  
901 E. 104<sup>th</sup> St. Ste 800  
KCMO 64134

## APPENDIX B

### Revised Cap-Express Items with Domains

Domain	Item #	Item Stem	Revisions
1	1	Help the student identify patterns in patient assessments	Guide the student in identifying patterns in patient assessments
1	2	Demonstrate how to manage a full patient load	Role model how to effectively manage a full patient load.
1	3	Demonstrate prioritization of patient care while precepting	
1	4	Provide opportunities to understand patient care across the continuum	
4	5	Communicate effectively with the interdisciplinary team	
3	6	Challenge the student to function at the full extent of their ability	
4	7	Take responsibility to oversee the student during all patient contact	
2	8	Describe my nursing practices so a student can understand	
1	9	Guide a student through complex patient care situations.	Easily guide student to manage complex patient care situations.
2	10	Allow time for student to troubleshoot while I maintain patient safety.	
1	11	Maintain patient safety as student learns through trial and error.	
4	12	Reach out to clinical supervisors when I have clinical questions.	
4	13	Feel safe when working with a student.	
4	14	Hold the student accountable for safe clinical practice.	
1	15	Feel comfortable explaining the rationale behind my decisions.	
1	16	Display a balance between patient care and student care.	Maintain a balance between patient care and student care.
1	17	Share my clinical expertise with the student.	
4	18	Always stay calm and cool under pressure.	
2	19	Balance student independence while providing supervision.	
1	20	Guide students to follow policies and procedures.	
2	21	Ask questions to challenge the student's knowledge and understanding.	
2	22	Feel comfortable when providing feedback.	
2	23	Adapt my teaching technique to suit students' learning needs.	
2	24	Provide feedback that clearly tells the student what is expected.	
2	25	Always seek to clarify if I don't understand a student's question.	
2	26	Find creative ways to teach clinical concepts.	
2	27	Ask students questions that encourage critical thinking.	Encourage critical thinking through questioning.
2	28	Provide feedback immediately after an event.	

3	29	Promote student self-confidence when teaching.	Promote student self-confidence.
3	30	Provide an orientation to the physical work environment.	Provide a thorough orientation.
2	31	Progressively add to the student's responsibilities for patient care.	
3	32	Help students overcome their fears.	
4	33	Use downtime productively in educating my student.	
1	34	Easily guide the student through new situations.	
2	35	Encourage the student to be proactive in doing patient care activities.	
2	36	Use all experiences as teaching opportunities.	
2	37	Effectively teach the student how to prioritize their time.	
3	38	Include the student in my decision-making processes.	
2	39	Provide adequate time for students to practice their skills.	
3	40	Step back to allow increasing student independence.	
3	41	Offer words of encouragement to promote confidence.	
3	42	Seek learning opportunities that will support the student's goals.	
2	43	Provide opportunities for debriefing after difficult events.	
3	44	Consider student input on prioritizing care.	
3	45	Demonstrate respect for the student in front of patients.	
2	46	Collaborate with the student when developing their overall learning plan.	Collaborate with student to develop their overall learning plan.
3	47	Encourage students to provide input while patient care decisions are being made.	
2	48	Help the student to create daily learning goals.	
2	49	Recognize student motivation as important to learning.	
2	50	Use student questions as an opportunity to teach.	
3	51	Always be patient when allowing student to perform a skill.	
2	52	Develop student goals in collaboration with the student's school.	
2	53	Understand student resistance or apprehension as a common part of learning.	
3	54	Recognize when a student is feeling overwhelmed.	
3	55	Recognize when a student is struggling to understand a concept.	
3	56	Not mind repeating instructions.	Patiently repeat instructions.
3	57	Always be approachable.	
3	58	Maintain eye contact when conversing with a student.	
3	59	Promote a sense of belonging for the student.	
3	60	Demonstrate enthusiasm when precepting students.	
3	61	Listen attentively to student suggestions.	
3	62	Empathize with the fears that result from being a student.	Demonstrate empathy for student fears.

3	63	<b>Not get frustrated with students.</b>	
3	64	Relate to the insecurities of being a student.	
2	65	<b>Be skillful in communicating difficult messages to students.</b>	
2	66	<b>Remain aware of my body language when communicating with students.</b>	
2	67	Acknowledge student questions.	
3	68	Boost the student's self-confidence.	
3	69	Stay patient when a student is slow at performing a skill.	
3	70	<b>Get to know my students on a personal level.</b>	
3	71	<b>Use a sense of humor in my work.</b>	
3	72	<b>Enjoy teaching students whenever needed.</b>	<b>Welcome the opportunity to teach students.</b>
4	73	<b>Demonstrate passion for being a nurse.</b>	
4	74	<b>Develop a personal plan for further growth as a preceptor.</b>	
4	75	Include the student in activities apart from direct patient care such as committees or council meetings.	
3	76	Protect the student's dignity.	
4	77	Maintain student confidences as private.	
3	78	<b>Believe students bring value to my work environment.</b>	
4	79	<b>Precept a student even when it feels like a burden.</b>	<b>Be kind even when precepting feels burdensome.</b>
4	80	<b>Precept even when feeling fatigued.</b>	<b>Maintain professionalism with student even when fatigued</b>
3	81	Recognize when a student is afraid.	
3	82	<b>Avoid making assumptions about a student's behavior.</b>	
4	83	Maintain a positive attitude when working as a preceptor.	
2	84	<b>Recognize areas for growth in my student.</b>	
3	85	<b>Recognize areas of strength in my student.</b>	
2	86	Not make assumptions of why a student made a mistake.	
4	87	Explain the importance of becoming certified in their area of practice.	
4	88	Understand the State Board of Nursing standards regulating student practice.	
4	89	<b>Follow my institution's policies or guidelines regulating student experiences.</b>	
4	90	<b>Provide opportunities for student to practice inter-professional interactions.</b>	
4	91	Leave work on time even when precepting.	
4	92	<b>Role model the nurse as a professional.</b>	<b>Role model the nurse as professional part of the care team.</b>
4	93	Maintain a portfolio of professional experiences and growth.	
1	94	<b>Emphasize the importance of shift-to-shift communication.</b>	
4	95	Encourage student to speak up when something looks wrong.	
4	96	<b>Encourage the student to function as a member of our healthcare team.</b>	

4	97	Present a professional image to those around me.	
4	<b>98</b>	<b>Be open to ideas that are different from my own.</b>	
4	<b>99</b>	<b>Be receptive to constructive feedback.</b>	
4	100	Demonstrate being accountable for my mistakes.	
4	<b>101</b>	<b>Demonstrate the importance of embracing change within healthcare.</b>	
4	<b>102</b>	<b>Always keep up to date with new practice evidence.</b>	
4	103	Inform the school immediately of unsafe clinical practice by the student.	
4	104	Provide opportunities to observe nursing roles outside of direct patient care, such as the manager, etc.	
2	<b>105</b>	<b>Recognize the student's learning style.</b>	
4	106	Feel energized from precepting a student.	
4	107	Demonstrate compassion in my work.	
4	108	Demonstrate excitement about working with a student.	
2	109	Provide feedback privately, and not in front of others.	

*Note.* The 67 items for this study are in bold. For domains, 1 = Clinical competence; 2 = Pedagogic Competence; 3 = Student-Centeredness; 4 = Nurse Professionalism.

APPENDIX C  
THE CAP-EXPRESS

Confidential Page 1

## The Cap-Express Study

Please complete the survey below.

Thank you!

**Welcome to the Cap-Express Study!**

**Section 1:**  
**The first questions will determine if you meet eligibility criteria to be in the study.**

I am a licensed Registered Nurse providing direct patient care	<input type="radio"/> Yes <input type="radio"/> No
I have been a Registered Nurse for at least eight months	<input type="radio"/> Yes <input type="radio"/> No
Have you precepted capstone students (students in their final clinical immersion experience) or do you plan to precept a capstone student?	<input type="radio"/> Yes <input type="radio"/> No

Excellent! You are eligible to participate in this study.

10/26/2021 12:11pm project/express/0/2

The following questions will be used to match your data between the first survey you already completed and this second survey. The purpose is to support the reliability of this new instrument. These questions were chosen to make remembering them easier, as they do not change over time.

Your Birth Month (2 digits, ie. 01)

\_\_\_\_\_

First Initial of your First MIDDLE name (Use X if no middle name)

\_\_\_\_\_

First Initial of Mother's FIRST Name

\_\_\_\_\_

Number of Older Siblings

\_\_\_\_\_

Description of preceptor experience

If you have precepted since you took this survey, please indicate who you have precepted

- Capstone students
- New graduate nurses
- Experienced nurses
- I have not precepted yet

If you have received any training since the first survey, please indicate what type of preceptor training received (Check all that apply)

- Online training
- In-person training
- Mandatory organizational course
- Optional organizational course
- College level course
- Other
- None

Please describe "other" type of training

\_\_\_\_\_

Thank you for your time. Your responses indicate you do not meet the criteria for this study.

Thank you for completing this section of the survey.  
\*\*\*\*\*

Section 3:  
The following section is the Capstone Experience Preceptor Preparedness Scale (Cap-Express) with 37 items estimated to take 5-8 minutes.

There are no right or wrong answers to these questions, and nobody will see or know your responses. Please answer as honestly as you can.

**Please rate your level of confidence to perform each item as of today, using the prompt: "If I were asked to precept a nursing capstone student, how confident am I in my ability to..."**

**The rating scale is from 1- 'Not at all confident' to 6- 'Totally confident'**

	Not at all confident	Only slightly confident	Somewhat confident	Moderately confident	Mostly confident	Totally confident
Guide the student in identifying patterns in patient assessments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Role model how to effectively manage a full patient load	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide opportunities to understand patient care across the continuum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Allow time for student to troubleshoot while I maintain patient safety.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Share my clinical expertise with the student.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Balance student independence while providing supervision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Guide students to follow policies and procedures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Find creative ways to teach clinical concepts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encourage critical thinking through questioning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide feedback immediately after an event.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promote student self-confidence.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Progressively add to the student's responsibilities for patient care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effectively teach the student how to prioritize their time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide adequate time for students to practice their skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Step back to allow increasing student independence.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seek learning opportunities that will support the student's goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide opportunities for debriefing after difficult events.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Demonstrate respect for the student in front of patients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborate with student to develop their overall learning plan.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Always be patient when allowing student to perform a skill.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recognize when a student is struggling to understand a concept.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Always be approachable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintain eye contact when conversing with a student.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promote a sense of belonging for the student.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstrate empathy for student fears.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Remain aware of my body language when communicating with students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get to know my students on a personal level.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a sense of humor in my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstrate passion for being a nurse.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Develop a personal plan for further growth as a preceptor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Believe students bring value to my work environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Avoid making assumptions about a student's behavior.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recognize areas of strength in my student.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide opportunities for student to practice inter-professional interactions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encourage the student to function as a member of <u>our</u> healthcare team.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Always keep up to date with new practice evidence.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recognize the student's learning style.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

Thank you for participating in this study!  
As an appreciation, please print off the Certificate of Participation attached for your portfolio.

---

Grant money has been received to support this study. The funds will not be available until November, so expect a \$25 gift card as a thank you before the end of November!  
This research could not work without all of you wonderful preceptors!  
To register for the gift card, please enter your information at this link:  
(you can copy and paste this link into the browser):

<https://redcap.umkc.edu/surveys/?s=KX8PHLKW8J>

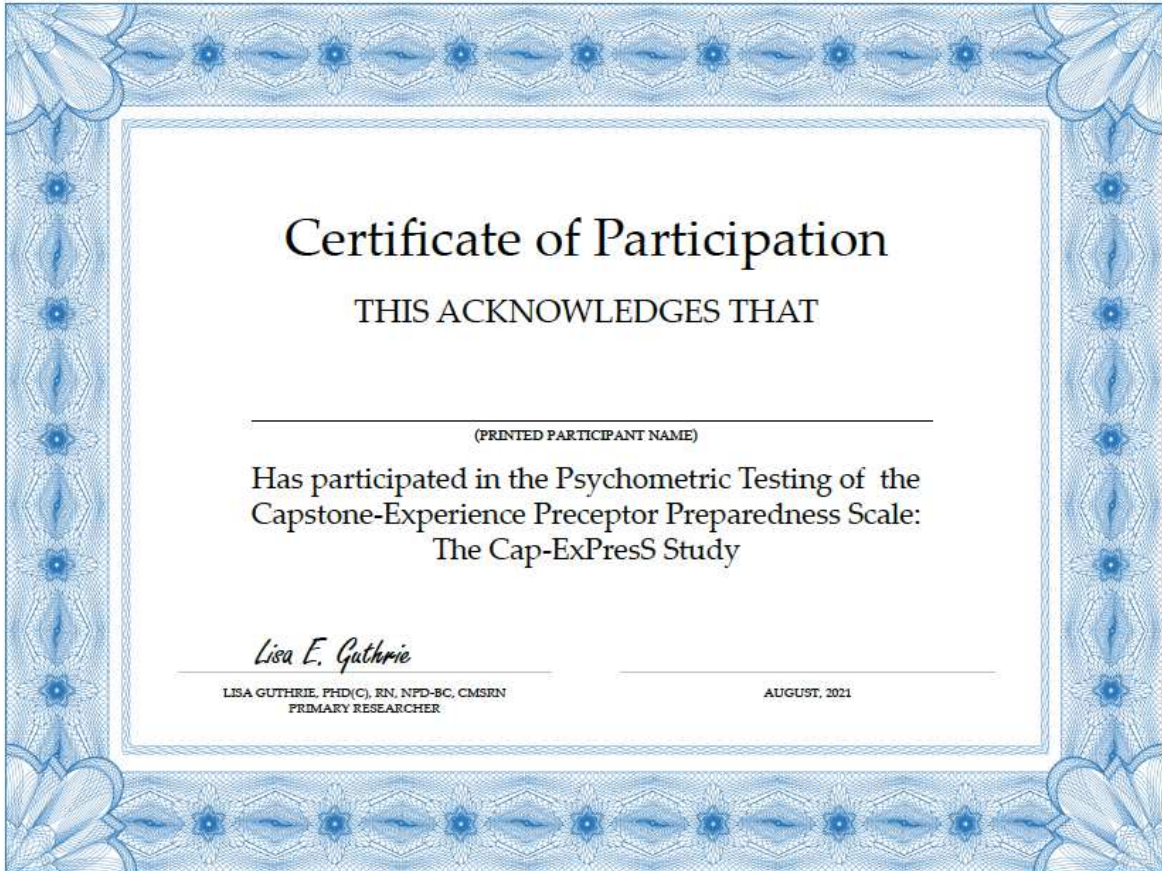
...then click submit to exit the survey.

Thank you!  
Lisa

[Attachment: "QR Code-Drawing.png"]

APPENDIX D

**Certificate of Participation for Test and Retest**



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## VITA

Lisa Eyring Guthrie was born in New York City, New York in 1961 to Edward J. and Mary Jane Eyring. She attended nursing school at the University of Tennessee (UT), Knoxville receiving her BSN in 1982. She began her career as a Medical-Surgical nurse at UT Medical Center. After beginning her family, she was hired as a physician assistant by her father in 1983, Dr. Edward J. Eyring, an orthopedist and rheumatologist. She implemented OSHA regulations into the practice when the emergence of AIDS and HIV were a major health concern. She moved to Fort Lauderdale, Florida area in 1996 and worked as an orthopedic nurse in a county hospital then a private Catholic hospital, being promoted to shift coordinator. In 2000, her family relocated to Raytown, Missouri where she continued as a Medical-Surgical/Orthopedic nurse.

In 2005, Ms. Guthrie began her work as an Education Coordinator for Carondelet Health. She also began pursuing her MSN in Rural Education at the University of Central Missouri, graduating in December 2010. She became certified in MS nursing (CMSRN) and in Nursing Professional Development (NPD-BC) and continues to maintain both certifications. As an Education Coordinator, she managed the continuing education program, was responsible for orientation and hospital-wide competencies for all RNs and coordinated student experiences. She supported city-wide initiatives through MOKAN, a collaborative student management group with over 50 education and clinical partners.

In 2015, Ms. Guthrie began working for The University of Kansas Health System as an Education Specialist. She began her Ph.D. in nursing program at the University of Missouri in Kansas City. She is a Top Reviewer for The Journal of Nursing Continuing

Education, a Board member for Christian Perspectives, and Co-Chair of the Kansas City Nursing Research Council. She is on the Leadership Committee for MOKAN and continues to support local and regional initiatives dealing with preceptors; having presented at SIGMA Nursing Education Research Conference in 2017 and multiple venues both nationally and regionally for her work on Academic Internships supporting student learning in behavioral health. Upon completion of her degree, Ms. Guthrie plans to pursue a career as a nurse scientist in a clinical setting, continuing her research with the Cap-ExPresS and supporting nurses and students as they perform research.