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Ashley Stubblefield Crumby

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VALUATION OF MENTORSHIP IN PHARMACY EDUCATION AND THE IMPACT OF PERCEIVED PERSONAL RELEVANCE

A Dissertation
presented in partial fulfillment of requirements
for the degree of Doctor of Philosophy
in the Department of Pharmacy Administration
The University of Mississippi

by
ASHLEY STUBBLEFIELD CRUMBY

August 2019
ABSTRACT

Mentorship is an important component of personal and professional development for student pharmacists. This research measured the value of mentorship in this population, examined potential influencing factors and the likelihood to participate in a mentoring relationship, and identified preferences for the mentoring relationship. Data collection involved survey self-report of student pharmacists (P1-P4) at four participating universities. An adapted 29-item Mentoring Functions Scale (MFS) was used to measure value, with functions divided into career and psychosocial categories. The highest ranked mentoring functions were psychosocial with an average score of 9 or greater on the 10-point scale. Perceived personal relevance, measured using the Revised Personal Involvement Inventory (RPII), was “high” on average and was found to significantly influence mentorship value along with age, year in school, and experience with mentorship. A discrete choice experiment (DCE), with twelve pairs of “mentoring program descriptions” was used to identify preferences for the mentoring relationship. This analysis revealed students prefer unassigned, long-term mentoring relationships with in-person interactions that take place once per month and focus on professional versus personal development although this difference was minimal. Overall, student pharmacists place value on both the career-oriented and psychosocial aspects of mentoring. Future research and refinement of the scale is needed to examine specific aspects and approaches mentorship approaches most desired.
# LIST OF ABBREVIATIONS AND SYMBOLS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>P1</td>
<td>First year of professional pharmacy curriculum</td>
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<tr>
<td>P2</td>
<td>Second year of professional pharmacy curriculum</td>
</tr>
<tr>
<td>P3</td>
<td>Third year of professional pharmacy curriculum</td>
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<tr>
<td>P4</td>
<td>Fourth and final year of professional pharmacy curriculum</td>
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<tr>
<td>DCE</td>
<td>Discrete Choice Experiment</td>
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<tr>
<td>RPII</td>
<td>Revised Personal Involvement Inventory</td>
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<tr>
<td>MFS</td>
<td>Mentoring Functions Scale</td>
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<tr>
<td>AACP</td>
<td>American Association of Colleges of Pharmacy</td>
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<tr>
<td>ACPE</td>
<td>Accreditation Council for Pharmacy Education</td>
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ACKNOWLEDGMENTS

This dissertation manuscript is the culmination of a long, but rewarding, journey toward a dream I never thought I would achieve this early in my professional life. Throughout the last 6 years, I have been blessed to have been surrounded by the most supportive colleagues, friends, and family. Without the influence of each and every person who has taken the time to invest in me, I would not have been able to achieve this goal.

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Also instrumental in my success through these last six years are other valuable members of the Pharmacy Administration department who have helped to mold me into the researcher and professional I am today. I am thankful for Dr. Donna West-Strum, my first department chair and a mother who helped me juggle the new responsibility of becoming a mother myself while also continuing in graduate school. I am also thankful for Dr. John Bentley, who not only realized my potential for success in graduate school long before I did, but who also encouraged me to return to Ole Miss and to pursue this opportunity, even after 5 years had passed. I have felt supported by the administration in my department every step of the way, and I will never forget their impact on my life. My appreciation also goes to Dr. Erin Holmes and Dr. Meagen Rosenthal for their help in shaping my research perspectives, Dr. Marie Barnard for her professional and personal perspectives that helped push me through the last year of graduate school and finally make it to the finish line, and Dr. Manvi Sharma, Dr. Yi Yang, and Dr. Ben Banahan for imparting their knowledge and experience to me during my time as a graduate student. I truly feel as if I am part of the best professional family possible and look forward to continued collaboration with these colleagues throughout my career.

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In addition to my colleagues, I have to recognize a few of my dearest friends, without whom I would have never made it through this program. Without my weekly breakfast dates with my friend, who is practically a sister, Meghan Anderson, I would not have kept my sanity over the last few years. Also, without the friendship of Tess Johnson and her amazing ability to listen and provide support, especially in the last few months of this process, I would not have been able to tackle some of the hurdles with a smile on my face. And finally, I want to give a shout out to my partner in crime and office-mate for several years, Nick Keeling. We came into this program together 6 years ago, and we are both reaching the end of the road and our ultimate goals at about the same time. It has always been a relief to have an understanding perspective from someone who was in the trenches with me, and I look forward to continued friendship with him and his family.

Finally, I want to express my deepest appreciation to my own family for their constant support and encouragement. To my parents for always believing in me and supporting me, even when they weren’t completely sure what I was doing. From lending a listening ear when I would call to tell them about a research project or class I was taking, to taking the kids off our hands for a few days so I could focus on an important school deadline, they have always been there for me, and I am forever grateful. I am also so appreciative and lucky to have great in-laws as well who have supported not only me, but also my husband while he took on great responsibility in times when my attention had to be elsewhere. And my greatest and most heartfelt thank you goes to my loving husband, Trey, and my sweet children, Amelia (5) and Theo (3). When I started this journey, we were younger and without children, and throughout this process we have gained two
amazingly talented and caring kids and a whole new perspective on what is important in life. Without Trey’s never-ending support, belief in me, and graciousness to let me follow my heart and reach for a dream, I would not be able to put these new letters behind my name. It may not have always been easy, but I’ve learned so much along the way and would not change one minute of what it took to get to the finish line. I’m grateful for the journey, but even more excited for the future!
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CHAPTER 1
INTRODUCTION

The concept of mentorship is an important component of personal and professional development and has been investigated in several areas such as business, academia, and the health sciences (B. Anderson, Cutright, & Anderson, 2013; Cho, Ramanan, & Feldman, 2011; Lyons & Oppler, 2003). In academia, it has been observed that individuals who have been mentored are more likely to be promoted, are more productive, and produce a greater number of publications compared to those who did not engage in a mentoring relationship (Beasley, Simon, & Wright, 2006; Haines, 2003; Ramanan, Taylor, Davis, & Phillips, 2006; Sambunjak, Straus, & Marusić, 2006). Other outcomes of this relationship include greater self-efficacy, increased job retention, and improved career satisfaction for the mentee as well as an increased likelihood that these individuals will become mentors themselves (Raub, Fiorvento, Franckowiak, Wood, & Gortney, 2017; Steiner, Lanphear, Curtis, & Vu, 2002; Zeind et al., 2005).

Two broad categories of mentoring functions were identified in the first systematic exploration of mentoring: career functions and psychosocial functions (Kram, 1983). Career functions are those such as sponsorship and coaching that are meant to enhance career advancement. Psychosocial functions include aspects of the relationship such as role modeling, counseling, and friendship that are intended to enhance competence, clarity of identity, and effectiveness in one’s role. Kram’s research also identified four distinct phases of the mentoring relationship including initiation, cultivation, separation, and redefinition (Kram, 1983). This work identified cultivation as the stage in which the mentoring functions typically peak, starting
first with career functions followed by psychosocial functions. It is from this original research that much of the mentoring literature stems.

Although much of the early mentoring literature comes from the world of business, a great deal of research has been conducted with regard to mentoring relationships in the health sciences including medicine, nursing, and pharmacy (Frei, Stamm, & Buddeberg-Fischer, 2010; Huybrecht, Loeckx, Quaeyhaegens, De Tobel, & Mistiaen, 2011; Raub et al., 2017). Much of this literature has focused on the desired characteristics of a mentor (Cho et al., 2011; Huybrecht et al., 2011), the success and/or failure of mentorship approaches, and the outcomes associated with a mentoring relationship in these settings (Flint, Jahangir, Browner, & Mehta, 2009; Hammond, Garner, Linder, Cousins, & Bookstaver, 2016; Huybrecht et al., 2011). It seems little has been done to investigate the value of mentorship from a student perspective, particularly among student pharmacists; yet perceived personal relevance, also known as “involvement”, and value are critical contributors to the potential for student engagement in a mentoring program. In addition to measurements of value and involvement, a clear definition of mentorship has not been identified from a student perspective, raising the question of whether students recognize mentorship and understand how it can benefit them. Finally, no work has been published to date exploring preferences of mentoring functions or characteristics of a mentoring relationship among student pharmacists with different career goals following graduation.

Overview of the Research

This study was conducted to measure student pharmacists’ value of and perceived personal relevance with regard to mentorship, and then assess how this level of value impacted their likelihood to participate in a mentoring relationship. This project included two phases, an
initial qualitative exploratory phase followed by a quantitative study phase. The exploratory phase included a series of in-depth interviews with seven current student pharmacists, two from each of the four professional classes (P1-P4) in pharmacy school. These interviews focused on exploring the critical attributes students find valuable in a mentoring relationship. Also included in the exploratory phase was a “live chat”, conducted via a closed Facebook group that closely resembled a focus group format. This chat included eight students from various years of the pharmacy curriculum at two different institutions. The discussion guide for this group focused on the evaluation of an operational definition for the term “mentor” as well as eliciting preferences for how the relationship should be structured and what functions students would like mentors to provide in each phase of the relationship. The results of this group were used to inform survey items that were used in the second phase of the project.

Following the exploratory phase of the project, an online survey was developed using Qualtrics survey software. Sections of the survey included:

- Demographics including institution and future career intentions
- Experiences with mentorship
- Preference for structural attributes of the mentoring relationship
- Perceived personal relevance (involvement) of mentorship
- Value of mentorship functions

Measurement of the mentorship experiences included items related to the perception of past and/or current mentoring relationships and whether a mentorship program (formal or informal) was offered at the student’s school of pharmacy.
To measure student preference for the structural attributes of the mentoring relationship, a discrete choice experiment (DCE) was conducted. The attributes and levels were determined by the exploratory investigation as well as through a literature search and included:

- Origin of the relationship (assigned vs. unassigned)
- Method of communication (in-person vs. online)
- Length of the relationship (short-term vs. long-term)
- Frequency of contact (weekly, monthly, once a semester)
- Outcome of the relationship (professional development, personal development)

The Revised Personal Involvement Inventory (RPII) (Zaichkowsky, 1994) was used to evaluate perceived personal relevance (involvement) of mentorship among student pharmacists. This scale has been widely applied to concepts in consumer behavior and includes evaluating the importance (value) of something to the respondent (Bienstock & Stafford, 2006). This study was designed to identify if a potential correlation between level of involvement and value of mentorship among student pharmacists existed.

The Mentoring Functions Scale was adapted for the study and was used to elicit perceived value of mentorship functions among current student pharmacists. This scale, developed by Kram and further studied by Noe, included items related to each mentoring function: coaching, acceptance & confirmation, role modeling, counseling, protection, exposure and visibility, challenging assignments, and friendship (Kram, 1983; Noe, 1988).

The study also evaluated the potential impact of the value of mentorship on students’ likelihood to participate in a mentoring relationship. This was done using both the value scores obtained from each of the categories, career and psychosocial, on the functions scale as well as a
single item that evaluated the overall perception of whether or not the respondent would participate in a mentoring relationship.

Data analysis included descriptive statistics for demographic variables. To evaluate how the value of mentorship changed based on potential influences, regression analysis was used in which the dependent variable was the average score on the Mentoring Functions Scale (MFS), also referred to in this paper as the mentorship value score, and the independent variables included involvement score, experience with mentorship, and future postgraduate path (objective 1). Regression analysis was also used to identify a possible predictive relationship between the measured value of mentorship for the career functions and psychosocial functions of the instrument and the likelihood to participate in a mentoring relationship (objective 2). A DCE using a multinomial logit model was used to identify preference among student pharmacists for structural attributes of the mentoring relationship (objective 3).

**Frameworks and Objectives**

**Conceptual Frameworks**

This study included the application of two conceptual frameworks (Figure 1). The first framework was drawn primarily from the work of Hunt and Michael, which provides a basic model of mentorship. The model, shown on page 6, included evaluation of the context of the mentoring relationship, mentor and mentee characteristics, the individual phases and duration of the relationship, and the outcomes related to the relationship. A detailed description of the framework can be found in the literature review (Chapter 2).
The second framework of the study included a more in-depth evaluation of the phases of the mentoring relationship as well as the functions that are performed. As previously mentioned, these functions are separated into two distinct categories, career functions and psychosocial functions, and occur primarily in the cultivation phase of the mentoring relationship. The main
areas of focus for this study included the initiation phase, or how the mentoring relationship is formed, and the cultivation stage in which the majority of the functions occur.

**Objectives**

In general, this research focused on evaluating the perceived value of mentorship among student pharmacists as well as the influence factors such as value and involvement had on the decision to participate in a mentoring relationship.

**Objective 1:** To quantify the level of value assigned to mentorship among student pharmacists and explore the potential factors that influence this value.

**Objective 2:** To measure the value of individual mentorship functions and how this perceived value influences the decision to participate in a mentoring relationship.

**Objective 3:** To assess the preferences for the structure of the mentoring relationship among student pharmacists.

**Importance and Significance of the Research**

The mentoring literature clearly describes the positive outcomes that can occur as a result of a mentoring relationship. From a career perspective, both mentors and mentees have the potential to experience increased satisfaction, confirmation, and career advancement (Haines, 2003; Hunt & Michael, 1983). Along with positive career outcomes, mentoring relationships can also have a positive impact on a personal level including increased self-efficacy, enhanced self-esteem, and a sense of belonging to the organization (Haines, 2003; Hunt & Michael, 1983).
Although mentoring relationships appear to be beneficial, it has yet to be determined how much value individuals place on these relationships, particularly within schools of pharmacy. It is unclear if student pharmacists recognize the impact a mentor can have on their future careers. Identification of recognition and value of mentorship among student pharmacists, particularly the preferences for mentoring functions and relationship characteristics would be of vital importance to schools of pharmacy. This could allow for the creation of mentorship programs, whether formal or informal, that would be valued by students and utilized to their fullest potential, resulting in positive outcomes for all involved. It could also seed targeted mentor development education, to better train mentors in the initiation and cultivation roles.
CHAPTER 2
LITERATURE REVIEW

MENTORING: A HISTORICAL PERSPECTIVE

The first formal introduction of the concept of mentoring can be traced back to the epic poem, the Odyssey written by Homer. (Homer & Fagles, 1969) In this tale, the great royal warrior Odysseus asks his friend and advisor, Mentor, to educate and lead his son, Telemachus. Mentor serves as the advisor for the entire royal household and guides Telemachus on a journey in search of his father and “a fuller identity of his own” (Homer & Fagles, 1969). Also in the story, Athene, the goddess of wisdom who provides over craft and skillfulness of the hand and mind, manifests herself to Telemachus in the form of Mentor. It was Mentor’s responsibility to provide an education that covered “every facet of life – physical, intellectual, moral, spiritual, social, and administrative development” (Mullin, 1992).

Through the story of Telemachus and Mentor, several important aspects of the mentoring relationship can be identified. First, mentoring should be intentional, as described by the way Mentor carried out his responsibilities. Second, mentoring should be a nurturing process in which the mentor puts forth the effort to help the mentee reach his full potential through growth and development. Third, the process of mentoring should be insightful, both for the mentor who is providing the wisdom and the protégé who is applying it. And finally, mentoring should take place in a supportive, protective relationship. In the Odyssey, Telemachus was expected to consider the advice of Mentor, and Mentor was to “keep all safe” (Homer & Fagles, 1969).

Another important aspect of mentoring that is exemplified by the Odyssey is the concept of role...
modeling. By taking human form, Athene shares with Telemachus the standard and style of behavior that he should emulate. This example can be used to show mentors how role modeling can help to influence perspective and develop a sense of empowerment for the mentee (E. M. Anderson & Shannon, 1988).

Although early uses of the term “mentor” can be dated back to the 1750s (Murray, 1908), it wasn’t until much later that formal mentoring research was first introduced in the professional literature. In the 1970s, the concept of mentoring for a professional career became an area of research and has since been studied in a variety of disciplines including business, academia, and the health sciences (B. Anderson et al., 2013; Cho et al., 2011; Clawson, 1980; Lyons & Oppler, 2003).

THE CONCEPT OF MENTORSHIP

Defining Mentorship

Mentoring relationships exist in almost every discipline including business, the health sciences, and academia. For leaders in business, it is common to have someone who is influential in professional development (D. J. Levinson, 1979). For graduates of pharmacy and medical schools, seeking residency and fellowship training with practitioners who are well-respected and experienced in their field is also common (Raub, Thurston, Fiorvento, Mynatt, & Wilson, 2015). For graduate students, mentorship may take the form of conducting research under the guidance of a “major” professor (Kiersma et al., 2012).

Despite its seemingly widespread application, the term “mentor” can have different meanings for different people. Because of this variability, the conceptualization of what mentorship is can vary widely as well. In most studies, researchers provide a specific definition
in an attempt to reduce this variability, but this has resulted in a lack of consensus about what a
mentor really is and what should take place in a mentoring relationship. Although many scholars
share the general view that a mentor is “a more senior person who provides various kinds of
personal and career assistance to a less senior or experienced person (the mentee)”, the slight
differences in the definitions still exist (Haggard, Dougherty, Turban, & Wilbanks, 2011).

In a mentoring relationship, emphasis is placed on identification of shared interests and
goals as well as assisting each other in achieving those goals.

Anderson and Shannon (1988) defined mentoring as:

“a nurturing process in which a more skilled or more experienced person, serving as a
role model, teaches, sponsors, encourages, counsels, and befriends a less skilled or less
experienced person for the purpose of promoting the latter’s professional and personal
development. Mentoring functions are carried out within the context of an ongoing, caring
relationship between the mentor and protégé”.

With this definition come essential attributes including (1) basis of mentoring (2) role
modeling, (3) five essential mentoring functions which will be discussed in detail later but
include teaching, sponsoring, encouraging, counseling, and befriending, (4) personal and
professional development, and (5) an ongoing, supportive and caring relationship (E. M.
Anderson & Shannon, 1988).

With these attributes in mind, it is important for the mentoring relationship to be one that
is nurturing. In this type of relationship, the nurturer (mentor) recognizes potential and actual
ability in addition to past experience and maturity of the mentee and is able to aid in growth and
development with this knowledge in mind. Role modeling, which goes hand-in-hand with
nurturing, is a way for the mentor to provide a sense of who the mentee is striving to become (E. M. Anderson & Shannon, 1988).

Mentoring is an influential component of personal and professional growth in many disciplines and consists of a relationship that is “reciprocal, dynamic, and collaborative in which an experienced professional offers guidance, support, and knowledge to a junior leader” (Steele, Fisman, & Davidson, 2013). In business, for example, many leaders and innovators can look back on their careers and identify mentors who influenced their professional development and success (D. J. Levinson, 1979). In this setting, the relationship is often between a relatively new or inexperienced employee and a successful, more experienced individual, often times in a managerial role. It is through the mentoring relationship that the more novice employees receive career development support (Lyons & Oppler, 2003).

In surgery and medicine, the concept of apprenticeship laid the foundation for the evolution of the mentoring relationship between trainees and more experienced physicians and although the term has changed, the fundamental aspects of the relationship have not (Steele et al., 2013). Academic medicine is another area in which the importance of mentorship can be seen. A high percentage of researchers attribute their choice in career to having an influential mentor (Levey, 1988). Research has also shown that mentored women in the academic medicine setting are more productive than those without a mentor, as measured by the number of research publications they produce (W. Levinson, Kaufman, Clark, & Tolle, 1991)

**Mentoring in Pharmacy**

For pharmacy, the role of the mentor has been described as “the highest calling within our professional ranks” (Pierpaoli, 1992). Paul Pierpaoli goes on to say that “nurturing the
growth and self-actualization of a health professional who will ultimately contribute to the health and well-being of society-at-large is one of the greatest contributions that any of us can make to humanity” (Pierpaoli, 1992).

Upon entering the profession of pharmacy, students and practitioners take an oath to "utilize [their] knowledge, skills, experiences, and values to prepare the next generation of pharmacists” (Oath of a Pharmacist, n.d.) In the early days of pharmacy education, the mentorship model consisted of master pharmacists who would impart their knowledge and train their apprentices, much like the model in medicine (Kremers & Urdang, 1986). The updated model of pharmacy education has shifted to a more clinically-focused curriculum that is based on experiences in the pharmacy environment (Hepler, 1987). Support for this mentorship model is evident in pharmacy education and is recommended by the American Association of Colleges of Pharmacy (AACP) and the Accreditation of Pharmaceutical Education (ACPE), which state that “faculty and preceptors serve as mentors and positive role models” as a component of developing professionalism and to fostering leadership in the college or school of pharmacy (Standards 2016, 2016).

Several examples of mentorship in pharmacy can be found in the literature including studies examining peer mentorship and formal mentoring programs, even one with graduate students as mentors for professional students in which the aim was to increase student interest in research (Kiersma et al., 2012; Rodis, Backo, Schmidt, & Pruchnicki, 2014).
THE MENTORING FRAMEWORK

Early research in mentoring focused on the identification and exploration of various components of the relationship separately. Although this research was beneficial, it wasn’t until the early 1980s that researchers attempted to create a framework for this exploration that could better drive mentoring research. A 1983 publication from the management literature provided an initial attempt at a suggested mentoring framework as a model for future study. This framework includes: (1) the context of the relationship, (2) characteristics of both the mentor and the mentee, (3) the stages of the mentoring relationship, and (4) the outcomes of the relationship (see Figure 2) (Hunt & Michael, 1983).

Figure 2. Basic Framework for the Study of Mentorship

(adapted from Hunt & Michael, 1983)
Context of the Relationship

The initial work by Hunt & Michael (1983) described the context of mentoring from a cultural perspective and included “organizational characteristics, careers or occupations, and social network or interpersonal relationships between mentors and other members of the organization.” This original description of context was applied in the area of business but may vary somewhat across different disciplines.

In examining the “organizational characteristics” component of the mentoring relationship in pharmacy, both work settings as well as academic settings would be the most commonly described. In the context of this research, the mentoring relationships found in pharmacy education are of interest and would include colleges and schools of pharmacy as the main type of organization. These institutions take interest in mentorship of their students and many have implemented formal programs as discussed earlier. When considering the “organizational structures and processes that will affect the frequency, quality, and outcomes of these [mentoring] relationships” which are mentioned in relation to the framework (Hunt & Michael, 1983), the likely application in pharmacy is in the structure and processes of the programs themselves. Because each institution is essentially responsible for its own application of mentorship, the variability of what is provided would have the most impact on the frequency, quality, and outcomes.

Hunt & Michael (1983) also state that “differences in careers or occupations may affect mentor-[mentee] relationships” and could ultimately impact the overall nature and even outcomes of the relationship. In pharmacy education, the difference in career can come in the form of pharmacy specialty or sub-specialty as well as choice of postgraduate path. With a
variety of options available, student pharmacists can explore various types of pharmacy careers and ultimately choose one that best suits their goals for the future. In this process, mentoring relationships may form as a result of these common, underlying interests.

Finally, the positions held by the mentors within the organization may also have influence on the mentoring relationship (Hunt & Michael, 1983). Mentors are commonly individuals who are considered successful in their fields. The definition of success may vary by discipline, but for the most part, mentoring relationships form between a younger individual and a more experienced individual who has received recognition in some form within the discipline. For pharmacy education, the relationship often exists between a student pharmacist mentee and a faculty member, practitioner, administrator, or other successful individual in the pharmacy profession.

**Personal Characteristics Affecting the Relationship**

The characteristics of the mentor and the mentee can be considered some of the most important factors in the mentoring relationship. Not only do they play a vital role in the formation of the relationship, but they also influence the overall characteristics and even the ultimate success of the mentorship (Hunt & Michael, 1983).

*Characteristics of the Mentor*

According to Hunt & Michael (1983), the characteristics of the mentor that have the most influence on the relationship include the differential between the mentor and mentee in terms of age, sex, position within the organization, power, and self-confidence. The typical mentor is roughly eight to fifteen years older than the mentee and is often of the same sex (D. J. Levinson, 1979), although these are not necessarily the characteristics of all mentoring relationships. Good
mentors have also been described as “highly placed, powerful, and knowledgeable individuals who are willing to share their expertise…” (Hunt & Michael, 1983). Although important, these characteristics have been explored primarily in the context of business and may differ across disciplines. In the health sciences, including medicine, nursing, pharmacy, and dentistry, additional characteristics of a good mentor have been described (Cho et al., 2011; Huybrecht, et al., 2011).

One study, conducted among the mentees of academic health sciences faculty identified two categories of characteristics for an outstanding mentor: personal qualities and professional traits (Cho et al., 2011). Mentees described admirable personal characteristics as having an “outgoing and interactive personality” including the use of words such as “brilliant, engaging, enthusiastic, and inspiring” (Cho et al., 2011). Other personal qualities that were deemed admirable were kindness, described with words such as “caring, compassionate, generous, and empathetic” as well as justness described as “ethical, fair, and honest” (Cho et al., 2011). In terms of their professional traits, mentors were often praised for being “collaborative, intellectual, a skilled clinician, and a teacher” (Cho et al., 2011).

Nursing mentors in another study identified “ability to give feedback, experience, availability of time, positive attitude, patience, and enthusiasm” as keys to a successful mentoring relationship (Huybrecht et al., 2011)

Characteristics of the Mentee

Arguably just as important to a successful relationship as the characteristics of the mentor are those of the mentee. When seeking out a mentee, some mentors may identify characteristics such as good performance and desire to advance their careers (Kanter, 1977).
Another mentee characteristic that may influence the mentoring relationship is the concept of involvement, or perceived personal relevance. Involvement is a motivational construct and involves both cognitive and affective aspects (Judith Lynne Zaichkowsky, 1994). In reference to advertising, involvement is defined as “a person’s perceived relevance of the advertisement based on inherent needs, values, and interests” (Judith Lynne Zaichkowsky, 1985). Although this construct has been studied extensively in the marketing literature, little has been done to evaluate the influence of involvement in other disciplines such as the health sciences. With regard to mentoring in the pharmacy education environment, the perceived personal relevance of mentoring may play a role in whether or not a student is likely to participate in a mentoring relationship and should be evaluated.

**Phases of the Relationship**

The mentoring relationship is dynamic, changing over time as both the mentor and mentee evolve in their roles. To best understand the true nature and impact of the mentoring relationship, it is important to examine how it changes over time. This change can be described using proposed “phases” of the mentoring relationship, described by a variety of researchers. Two studies of women managers first attempted to delineate these phases (Missirian, 1982; Phillips, 1977). These studies were conducted in a retrospective manner, were derived from one perspective of the relationship, and included only interviews of female managers, however, which limit their application to the general mentoring relationship.

To further develop the concept of mentorship phases, Kram (1983) conceptualized an improved model that clarified these proposed phases by separating them into psychological and organizational factors that may cause the relationship to move through each of the phases.
Utilizing an in-depth-interview format of 18 pairs of managers, this study explored the mentoring relationship from both perspectives, allowing for investigation of not only how the relationships change over time but the impact of the relationship on each individual at each phase (Kram, 1983). According to Kram, four distinct phases of the mentor-mentee relationship have been described and include: initiation, cultivation, separation, and redefinition (Kram, 1983; Phillips-Jones, 2001). Although these mentoring relationships may vary in length, the majority proceed through these four phases.

The first phase of a mentoring relationship, initiation, is when the relationship begins to form over a period of weeks to months. During this phase, the mentor and mentee begin to get to know one another through common tasks. The mentee develops a sense of respect for the mentor’s ability to provide support and guidance and exhibits a strong desire to be coached. The mentor, in return, is able to identify the mentee’s potential and encourages opportunities for interaction (Kram, 1983).

During the next phase, cultivation, mentoring functions typically peak, starting first with career functions followed by psychosocial functions. This phase can last anywhere from two to five years and includes the development of a relationship in which both individuals benefit both professionally and personally. The beginning of the relationship is focused more on the mentee learning how to navigate challenging tasks or experiences with the help of their mentor, and as a deeper bond begins to develop, the relationship may develop into that of a friendship. It is also during this phase that the mentee becomes more self-confident in his/her abilities. As the mentee learns how to approach each task or experience using the mentor’s support and guidance, autonomy is developed and eventually results in situations where the mentee no longer needs the assistance of the mentor (Kram, 1983).
In the third phase, separation, changes take place in the functions that are provided by the relationship and each individual goes through a period of reassessing the value of the relationship. This separation can be both structural and psychological as the mentee essentially “moves on” from the relationship in its original form. In some relationships, this can result in feelings of resentment or hostility as the mentor feels “abandoned” or the mentee begins to feel “stifled” rather than supported. This is a natural progression, and if the relationship is allowed to evolve, can lead to a more peer-like friendship rather than ending the relationship altogether.

The final step, redefinition, is the phase of the relationship in which this evolution takes place. Although different from the original structure, this relationship is still based on mutual admiration and support, but more often from a distance and without the heavy reliance on the mentor’s expertise or experiences. In this phase, the mentee is able to operate independently and has the ability to enter the relationship as more of a colleague.

Outcomes of the Relationship

Mentoring relationships vary in their levels of success, but regardless of how successful they may be, every relationship results in outcomes for the mentor, the mentee, and the organization or the overall profession. The anticipation is that these outcomes would be positive, but negative results are also possible.

Mentor

Although much emphasis is placed on what the mentee receives from a mentoring relationship, the mentor can also benefit greatly. Mentors may find that they enjoy helping less experienced individuals in their development and can often see increased satisfaction and confirmation by serving in this role (Hunt & Michael, 1983). Other benefits to mentors can
include increased self-esteem and worth as well as the development of a work life that is more rewarding and meaningful (Haines, 2003). Mentors have also reported not only advanced standing within their organization or profession but also enhanced quality of life through the close personal relationships that mentoring can foster (Haines, 2003). For those individuals seeking to leave a legacy through the development of others, mentoring relationships may be one way for this to happen.

With respect to potentially negative outcomes associated with a mentoring relationship, some mentors have reported mentees who may lack the skills needed to meaningfully contribute to the relationship as well as those who may not receive constructive criticism well. These mentees may not take the coaching or feedback seriously and fail to implement the advice their mentors are providing. Also, when the nature of the relationship changes due to the evolution of the needs on the sides of both the mentor and mentee, either party may become envious or resentful of the other (Hunt & Michael, 1983; Kram, 1983)

**Mentee**

For the mentee, the most common outcomes of interest in a mentoring relationship are career-oriented. Existing literature supports the idea that mentoring can help with promotion, publication, and obtaining grant support for research (Beasley et al., 2006; Ramanan et al., 2006; Sambunjak et al., 2006; Steiner et al., 2002). Mentorship programs in pharmacy residencies have been shown to help residents obtain careers upon completion of their residency training (Raub et al., 2015). Mentorship has also resulted in increased self-efficacy, improvements in job retention, greater career satisfaction, and the desire to become mentors themselves (Feldman, Arean, Marshall, Lovett, & O’Sullivan, 2010; Steiner et al., 2002; Zeind et al., 2005).
Student pharmacists often face stressors such as struggling with transitioning into the professional curriculum and feelings of discomfort in seeking answers to questions from senior students or faculty. Advice and guidance from a mentor can help students cope with these stressors while also facilitating professional growth (Raub et al., 2017).

Negative outcomes for the mentee can also be associated with a mentoring relationship. If a relationship is not a good match in the beginning or ends prematurely, the mentee may experience a loss in self-esteem, frustration, or even a sense of betrayal (Hunt & Michael, 1983). Although the hope would be that the mentoring relationship would be positive, this may not always be the case. Some mentees experience mentors who may take credit for their work or become possessive of the mentee’s time, stifling their growth and professional development (Haines, 2003). Relationships with the wrong mentor can cost the mentee valuable time, and in some instances mentors are not ready to give the appropriate amount of independence and autonomy when the mentee is ready. This can negatively impact the mentee by fostering a sense of dependence on the mentor for success and achievement (Haines, 2003; Hunt & Michael, 1983).

**Organization**

In general, research has shown that mentorship helps to develop new managerial talent for an organization or profession as well as providing greater utility of older managerial talent through the relationship (Hunt & Michael, 1983). This not only helps with the growth and development of those less experienced individuals who will later be leaders of the organization or profession, but it can also rejuvenate and refocus the more experienced leaders, resulting in positive outcomes for the organization or profession. Through mentorship, a profession can see benefits through the creation of more engaged and active members who are self-confident and
knowledgeable. It is also likely that those who have been mentored become mentors themselves, which can also benefit the organization or profession (Hunt & Michael, 1983).

THE MENTORING RELATIONSHIP

Formation of the Relationship

Formal Mentoring

The traditional mentoring relationship consists of a dyad between a mentor and mentee, often in the context of a formal mentoring program (Witry, Patterson, & Sorofman, 2013). Formal mentoring programs typically include matching younger and more experienced individuals and providing them with guidelines and expectations for the interactions (Baugh & Fagenson-Eland, 2008). The overall goal of these programs is to take a more holistic approach to education than what is provided in the traditional curriculum (Lester & Johnson, 1981). The goals of these programs go beyond those of clerkships, which focus on enhancing clinical skills. Formal mentoring programs in the health sciences focus on providing support and guidance with regard to career decisions, as well as professional socialization in the student’s respective area of study (Sambunjak et al., 2006; Stewart & Krueger, 1996).

Mentoring Functions

The five basic mentoring functions, described by Anderson and Shannon (1988) include teaching, sponsoring, encouraging, counseling, and befriending. Because mentoring can focus on professional and/or personal development, it is important for mentors to be able to exhibit any or all functions as the relationship evolves.
In the role of teacher, the mentor has the ability to aid the mentee in the development of new skills while acquiring new knowledge and a sense of what is needed to succeed in the desired professional environment. The mentee’s responsibility with regard to the teaching function is to not only be responsive to the information provided by the mentor but to also be an active participant in the relationship, seeking out and applying the mentor’s wisdom and guidance.

The next mentoring function is sponsoring and includes the mentor protecting, supporting, and promoting the mentee. The goal of sponsoring is to aid the mentee in achievement of professional goals such as job attainment or promotion. In this role, the mentor can help the mentee make professional connections with people in their network and “vouch for the great ability of the candidate for admission” (Josefowitz, 1980).

In the mentoring relationship, the mentor also serves to provide encouragement to the mentee through affirming his/her skills, achievements, and future potential, inspiring the mentee by providing an example through words and actions, and challenging by inviting the mentee to participate in activities that will allow for growth and development as a person and professional (E. M. Anderson & Shannon, 1988; Haines, 2003).

The final two functions, counseling and befriending, develop later in the relationship and are based on a relationship that goes beyond professional goal attainment. When a mentee is faced with a difficult situation, the mentor can serve as a counselor by actively listening to the problem, asking pertinent questions, and helping the mentee to develop a plan for how to deal with the problem. The friendship that can develop through a mentoring relationship is one built on acceptance and the ability to relate to the mentee. Through this friendship, the mentor can show the mentee that they are understood and supported (E. M. Anderson & Shannon, 1988).
Kram further expands on the five basic mentoring functions and also separates them into two broad categories: career functions and psychosocial functions (Kram, 1983). The individual functions that fall into each category can be seen in Table 1.

<table>
<thead>
<tr>
<th>Table 1. Mentoring Functions</th>
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<tbody>
<tr>
<td><strong>Career Functions</strong></td>
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<tr>
<td>Sponsorship</td>
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<tr>
<td>Exposure-and-visibility</td>
</tr>
<tr>
<td>Coaching</td>
</tr>
<tr>
<td>Protection</td>
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<tr>
<td>Challenging assignments</td>
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</tbody>
</table>

In general, career functions are those that provide professional socialization and prepare the mentee for job attainment and advancement opportunities. Psychosocial functions, on the other hand, help the mentee to develop confidence in his/her abilities as well as competence and effectiveness in the professional environment. It is through this delineation of functions that different types of mentoring relationships develop and are described. As previously stated, the cultivation phase of the relationship is the one in which the majority of the functions are provided.

**SUCCESSFUL MENTORING RELATIONSHIPS**

Ideally, a mentoring relationship is one that is reciprocal, dynamic, and collaborative. Through the interactions of the mentor and the mentee, guidance is offered from the more experienced professional, and the mentee is able to learn and feel supported (Platz & Hyman, 2013). When comparing mentoring to other types of professional relationships, the main differentiating factor is the emphasis on teaching. Through the mentoring role, the more experienced individual helps to aid mentees in the identification of personal and professional
goals and then helps them develop a plan to reach these goals, often drawing from personal experience or things they have learned throughout their careers. The mentor is actively teaching rather than just expecting the mentee to take on a more observational role.

The ideal relationship involves two-way communication as well as flexibility in structure. Although generational or hierarchical barriers may exist, the most effective true mentoring relationships are those in which these barriers are overcome and true discussion exists (Platz & Hyman, 2013). The relationship should be personalized to meet the needs and preferences of the mentee and the mentor in order for both parties to receive maximal benefit.

THE VALUE OF MENTORSHIP

Although it should be clear that mentorship is valuable, literature attempting to measure this value is lacking, especially in the context of pharmacy education. A study by Sierra and Adams (2017) emphasizes the influence mentorship can have on career choice by highlighting how a formal mentoring program impacted student pharmacists’ attitudes toward and intentions to pursue careers in academia. This work showed that students who participated in this formal program and had a positive mentor-mentee relationship felt that their interest in academic pharmacy was strengthened or re-affirmed as a result of this interaction. This emphasizes the importance of building relationships with faculty members and how influential the mentor-mentee relationship can be.
The perceived value of mentorship can also be assumed by the inclusion of this concept in the 2016 version of the ACPE “Standards”, which schools and colleges of pharmacy must meet for accreditation (Sierra & Adams, 2017). Mentorship can be highlighted here as a component of leadership and professional development and is considered important in creating an environment where faculty and administrators serve as key role models and mentors for students.

PERCEIVED PERSONAL RELEVANCE (INVOLVEMENT)

In addition to measuring the value of mentorship, concepts from other disciplines, such as the concept of involvement from the marketing literature, has also not been explored in the context of mentorship in pharmacy education. At first glance, the term “involvement” in this context might be assumed to mean involvement in extracurricular activities from a student affairs perspective. But for the proposed research, the involvement construct actually intended to measure perceived personal relevance which has the potential to influence the level of value placed on mentorship just as it influences purchasing decisions in the area of marketing.

The concept of involvement, introduced by Zaichowsky (1986) and Bloch and Richins (1983), was conceptualized with three major antecedents in mind: characteristics of the person, characteristics of the stimulus, and characteristics of the situation. It was believed that one or more of these factors could influence the level of involvement a consumer may have with products, with advertisements, or with purchase situations. Although involvement has been studied from various perspectives, product class involvement and involvement with purchase decisions are most closely aligned with the involvement that may exist with regard to mentorship and the decision to participate in a mentoring relationship. With product class involvement, the
needs and values of the consumer are considered, creating situations in which the same product may be perceived differently by different people based on the perceived personal relevance they attach to that product. With mentorship, students who may not perceive it to be personally relevant may view the mentoring relationship completely differently than a student who finds it to be extremely relevant.

In the context of a purchase decision, involvement includes a behavioral change that occurs only when the consumer finds the potential purchase or consumption situation to be personally relevant or important (Zaichkowsky, 1986). Much of the focus of research in this area involves manipulating the purchase situation in order to study the subsequent change in purchasing decision made by the consumer. In this context, mentoring can be considered the situation which may be manipulated to make it more relevant to students, thus potentially changing the level of involvement they may have with the mentoring relationship.

**DECISION TO ENGAGE IN A MENTORING RELATIONSHIP**

Due to the exploratory nature of this work, the factors associated with the decision to engage or participate in a mentoring relationship have not been previously examined. The value one places on mentorship can directly influence their intention to engage in a relationship, and this value may be influenced by the perceived personal relevance of mentorship to the student, the student’s experience with mentorship, and the student’s future career intentions. Figure 3 depicts a model for engaging in mentorship.
Figure 3. Model of Mentorship Valuation & Engagement
CHAPTER 3
RESEARCH DESIGN

OVERVIEW

Restatement of Purpose

As stated in the introduction, the purpose of this study was to measure the perceived value of mentorship among student pharmacists. This study aimed to assess how perceived personal relevance and value of mentorship functions influenced the likelihood that students would want to participate in a mentoring relationship as well as to elicit preferences for this relationship. Although research exists examining preference for mentoring functions, data are limited mainly to mentorship in business relationships and little has been done to explore overall perceptions of value, especially among student pharmacists.

Research Hypotheses

Three primary objectives address the areas of research interest. Those objectives follow, along with the individual hypotheses intended to address those objectives. The research hypotheses are stated in their null forms and represent a contradiction of expectations based on the literature and preliminary exploratory research. The statistical analyses described later sought to reject these null hypotheses.
The specific objectives related to this study are stated below and include:

**Objective 1:** To quantify the level of value assigned to mentorship among student pharmacists and explore the potential factors that influence this value.

- **H1aO:** The level of value assigned to mentorship does not differ based on level of involvement.
- **H1bO:** The level of value assigned to mentorship does not differ based on experience with mentorship.
- **H1cO:** The level of value assigned to mentorship does not differ based on future career intentions.

**Objective 2:** To measure the value of individual mentorship functions and how this perceived value influences the decision to participate in a mentoring relationship.

- **H2O:** The value of mentorship functions has no influence on participation in a mentoring relationship.

**Objective 3:** To assess the preferences for the structure of the mentoring relationship among student pharmacists.

- **H3O:** Preferences for the structural attributes of mentoring relationships are consistent for all student pharmacists.

**PRELIMINARY EXPLORATORY RESEARCH**

Value of mentorship in pharmacy education is an area that has not been explored in any great detail. To ensure the appropriateness of the items, an initial exploratory phase of research was conducted and included both in-person depth interviews and a subsequent online focus
group with student pharmacists. The purpose of this phase of the research design was to gather information to better understand the perceptions and preferences for mentorship in this population. The results of this initial exploration have been used to inform the survey development and selection of attributes for the DCE used in the second phase of the study.

**Interviews**

Prior to the focus group and survey development, preliminary data were collected through a series of in-depth interviews with seven student pharmacists at the University of Mississippi. The purposive sample was selected to reflect diversity among the student pharmacists with regard to professional year in school and included students currently enrolled in the first through fourth years of the professional curriculum.

Interviews were conducted primarily to explore the topic of mentorship in this population, to increase the reliability of the subsequent questionnaire by providing more guidance with its development, and to reduce respondent misunderstanding of the topic by gaining clarity of the subject content. The interview guide that was utilized during this phase of exploratory research is provided as Appendix A.

Although each respective section of the interview guide was developed to better explore the concept of mentorship, the application of the results was used to elicit preferences for the structural attributes of the mentoring relationship to allow for the selection of the most appropriate attributes for the conjoint task. The final section of the interview guide included questions and a card sort activity that allowed students to rank potential attributes of the relationship in order of importance to them.
Attributes that were evaluated include:

- How the relationship is formed (ex. assigned vs. not assigned)
- The number of people in the mentoring relationship (2 people, multiple mentors and one student, multiple students and one mentor)
- The type of mentor in terms of role (peer, faculty member)
- Method of communication (face-to-face, online, combination of both)
- How long the relationship lasts (“short term” = 6-12 months and “long-term” = 2-5 years)
- Frequency of contact (daily, weekly, monthly, quarterly, as needed)
- Outcomes of the mentoring relationship (career counseling/advancement, professional development, personal development)

According to the ranking by the seven students interviewed, the attribute they found most important when considering a mentoring relationship was “how the relationship is formed”. When asked to further explain this ranking, several of the students indicated that they felt mentorships in which the relationship was not assigned were preferred to those in which the student was assigned a mentor. The students stated they found the most value in the mentorships that developed naturally, either by them seeking out a mentor or by a mentor offering to guide them based on common interests or similar personalities.

The attributes “frequency of contact” and “outcomes of the relationship” were also considered among the most important when considering the mentoring relationship. The students stated that they preferred mentors who were “more available” and able to meet with them on a regular basis as opposed to only meeting once or twice a semester. With regard to outcomes, students stated the “what’s in it for me?” aspect of a mentoring relationship was also very important. Knowing that the outcome of the relationship was clear and both the mentee and
mentor were working toward achieving the same goals was also considered important. Overall, students appreciated relationships with a clear purpose such as selecting an appropriate postgraduate path upon graduation.

The attributes with the lowest rankings included both “the number of people in the mentoring relationship” and “the role of the mentor”. Students indicated that, to them, mentoring relationships were almost “understood” or “assumed” to take place between one mentor and one mentee in the traditional sense. According to the students, larger groups were not something they would consider “mentorship” necessarily. Along with this thought, students also indicated that in pharmacy education it was also almost assumed that the mentoring relationships developed in the professional years were done so with a faculty member/administrator and a student. Although the respondents did find value in peer mentorships, they stated that “for what they were seeking in pharmacy school, mentorship was mostly understood to take place with a more experienced individual”.

As a result of these interviews, the two lowest ranking attributes were removed from the list for the DCE and the conceptual definition of “mentorship” was altered to include the assumptions that the relationship is one-on-one in nature and occurs between a student and an experienced individual, such as a faculty member, administrator, or supervisor.

**Online Focus Group**

As a secondary component of the preliminary exploratory research, a type of synchronous electronic “focus group” (a Facebook live chat) was conducted to expand upon the concepts identified as important during the interviews. This group consisted of eight students and took place via a closed Facebook group designed specifically for the live chat. This approach
was adapted from a similar focus group conducted in health behavior (Thrul, Belohlavek, Hambrick, Kaur, & Ramo, 2017) and was used due to the relative difficulty in getting in-person participation from students at various institutions and in differing professional years.

The live chat included ten individual prompts (see Appendix B) that the students were able to read, interpret, and then comment on with their thoughts. The students were encouraged to not only provide their answers but to also thoughtfully evaluate the answers of fellow students and provide feedback when they felt it was necessary. The topics for the posts included the evaluation of a definition of mentorship, characteristics of a good mentor, and importance of mentorship to the students’ future career goals. Also included were questions designed to further explore the attributes selected as most important in the depth interviews.

All eight students who were recruited to the live chat attended and commented on each of the ten posts. Overall, the students further emphasized the importance of the structural attributes identified in the interviews and expanded upon their individual preferences within those categories. When asked about how important they felt mentorship was to their future career goals, all eight students stated that they felt it was almost essential to have guidance toward pursuing those goals. They stated that mentors are helpful in setting goals, making plans to achieve those goals, and for holding them accountable.

When asked about the structural components of the relationship, students reported that how the relationship is formed is very important to them and preference was given to establishing a mentorship outside of a formal, assigned relationship. Students also stated, however, that if the personalities are a good fit and the interests are similar, the way the relationship forms may not be of utmost importance. In terms of communication, students prefer face-to-face meetings over other options such as email communication or even Skype or
FaceTime discussions. Although not opposed to virtual communication entirely, students stated that if given a choice, they would rather meet face-to-face with their mentors.

Also discussed were the attributes relating to length of relationship and frequency of contact. Students were somewhat mixed with regard to answers on these two subjects with the majority stating they preferred longer relationships that span a few years and include contact at least every few months. Some students did state that shorter relationships that focus on one pertinent short-term goal, such as obtaining a summer internship, would be okay as well. The overall sentiment among the students is that they preferred a mentor who would be “available” and “takes an interest in the student’s plans and goals”.

Finally, the attribute regarding the outcomes of the mentoring relationship yielded an interesting discussion. When given the options of a relationship focused on career functions (professional), psychosocial functions (personal), or a combination of the two, all eight students stated they prefer the relationship with their mentor to include components of both personal and professional aspects. They realize the difficulty in separating the two from each other and even stated that for the relationship to reach its potential, a closer mutual understanding is needed. One student did state, however, that for the shorter-term mentorships, a focus on solely career functions may be appropriate. But for longer relationships a combination of both career and psychosocial functions is preferred.

Overall, the focus group provided further support for the selection of the same DCE attributes as was seen in the depth interviews. By verifying this information among two different groups of students, using two different methods, more confidence can be placed in the fact that these attributes are indeed some of the most important to students when considering the mentoring relationship.
MEASUREMENT

Conceptual Frameworks

For this study, the mentorship framework (Hunt & Michael, 1983) was used to illustrate the mentoring relationship. Also used in this research were the phases of mentorship, the concept of involvement, and mentorship functions, all described in the previous chapter.

The mentorship framework has been used in a variety of settings to describe the antecedents and outcomes associated with the mentoring relationship. Figure 4 depicts the version of the model that was used in this research.

Figure 4. Proposed Mentorship Framework, adapted from Hunt & Michael (1983)
Although similar to the original model, the adapted version used in this study incorporated changes in the context, characteristics of both the mentor and mentee, and outcomes of the mentoring relationship that make it more applicable to the pharmacy education setting.

**Conceptual definitions**

In order to improve the reliability of the results of the research, it was important that all participants began with a similar understanding of the term “mentorship,” as this was the main focus of this study. To understand the mentoring relationship, respondents also needed a baseline understanding of what a mentor is and what a mentor can provide. Based on the information gathered through the preliminary interviews and focus group as well as an extensive literature review, a definition of the term “mentorship” was developed for the purposes of this research and was provided to the students at the beginning of the survey. Mentorship in this study was defined as follows:

**Mentorship:** The provision of guidance, support, and advice in order to enhance both the personal and the professional development of a mentee. In this relationship, the mentor often provides support based on personal experience, but encourages the mentee to create goals based on personal interests and aides in the achievement of these goals.

This study focused primarily on quantifying the value student pharmacists place on mentorship, requiring the concept of “value of mentorship” to also be defined. For this study, the definition of the “value of mentorship” was also derived from the preliminary phase of the research and was as follows:

**Value of mentorship:** The level of importance or usefulness one places on mentorship activities and the mentoring relationship.
Finally, the concept known in the marketing literature as “involvement” was also measured, and this term was conceptualized as follows:

**Involvement:** “A person’s perceived personal relevance of the object based on inherent needs, values, and interests” (Zaichkowsky 1995).

**Development of the Survey Instrument**

To achieve the stated objectives, the design for this study included the completion of a survey instrument. This survey included questions developed using information from the qualitative phase of the research, questions from a validated survey instrument regarding mentorship functions, questions from a validated survey instrument designed to measure involvement, and a DCE for measuring preferences for the structure of mentoring relationships. To accomplish the research objectives, each concept associated with the proposed model was operationalized as a measurable variable (Singleton & Straits, 2010). The following sections outline how each objective was evaluated.

**Mentorship Valuation and the Potential Influence of Factors (Objective 1)**

Students’ perceptions regarding the value of mentorship was obtained in two ways. First, to establish the perceived value of the functions performed in a mentoring relationship, an adapted version of the Mentoring Functions Scale (Noe, 1988) was used (see Appendix C for sample survey). This 29-item scale included items related to functions in each of the two broad categories described in the previous chapter, career functions and psychosocial functions. The functions evaluated mirrored those proposed by Kram (1983) and included: sponsorship,
exposure-and-visibility, coaching, protection, challenging assignments, role modeling, acceptance-and-confirmation, counseling, and friendship. The value of each of the functions was assessed using the 29-item scale. Students were asked to indicate the level of value of each statement on a 10-point scale in which 1= not important and 10=extremely important. To establish overall value of the functions as a whole, an average value score was calculated for each respondent.

Due to the relative novelty of using the Mentoring Functions Scale to measure mentorship value in pharmacy education, a single-item measure was also used as a validity check. This global mentorship value score was measured by asking the students to rate how important they perceived mentoring to be on the same 10-point scale used for the individual functions. This score on the global item was then compared to the average score using the MFS.

Potential influencing factors studied included perceived personal relevance (involvement), experience with mentorship, and future postgraduate plans. The concept of involvement, described in the previous chapter as perceived personal relevance, was measured using the Revised Personal Involvement Inventory (RPII) developed by Zaichkowsky (1994). This 10-item, 7-point semantic differential scale asked students to rate mentoring on a variety of factors including important/unimportant, boring/interesting, relevant/irrelevant, etc. The scale scores were then summed, and each respondent was given a score indicating his/her level of involvement with mentorship. The sum scores were categorized as low involvement (score of 10-29), medium involvement (30-50), and high involvement (51-70) as described in Zaichkowsky (1994).

The demographics section of the survey instrument was used to identify both experience with mentorship as well as future postgraduate plans. Students were asked to identify whether
they currently had a mentor as well as whether their institution had a mentorship program. Examples of general mentorship program structures were provided, and students were asked to choose the one that best represented what was available at their institution. Students were also asked to identify their current postgraduate plans at the time of the survey by choosing from a list of commonly pursued directions while also leaving space for the students to indicate alternate plans if their plan was not listed. For analysis, the responses were collapsed into two categories, “pursue further education/training” and “no further education/training” to better represent the two predominant paths students take following graduation.

Valuation of and Likelihood to Participate in a Mentoring relationship (Objective 2)

As described in the previous section, the value of the individual mentorship functions was measured using the 29-item scale and an average value score was calculated for each of the two categories, career functions and psychosocial functions, and these averages were used as predictors in the model. To measure the likelihood of participating in a mentoring relationship, a single item was used and included rating this likelihood on a scale ranging from 1=not likely at all to 10=extremely likely.

Preference for Relationship Structure (Objective 3)

To accomplish this objective, evaluation of the structural attributes of the mentoring relationship was done using a discrete choice experiment (DCE). This analysis included the evaluation of pairs of vignettes or “descriptions” of various mentoring programs in which a student could participate. Because DCEs assume that individual decisions with regard to a good or service are determined by the attributes or characteristics of that good or service (World
Health Organization, 2012) it can prove to be a valuable analytical tool in measuring preferences for the mentoring relationship. In a DCE, researchers create profiles that vary in terms of the specific attributes they are attempting to measure. These profiles are then presented in choice sets, and respondents are asked to choose which profile they prefer. Through this choice, information is provided regarding whether attributes are important to the respondent, the direction of this importance, and the relative importance of the attributes when compared to each other. DCEs are also valuable because they provide information regarding trade-offs that respondents are willing to make between attributes by estimating how much of one attribute someone is willing to give up in order to have an improvement in another. In addition to trade-off information, DCEs also allow for estimation of the probability of respondents engaging in a hypothetical relationship with specific attributes.

The research design section that follows utilizes the general outline for conducting a DCE provided by the World Health Organization (2012). The following general stages form the overall framework for design:

1) Identification of attributes and assignment of levels

2) Experimental design: deciding what choices to present to individuals

3) Development and administration of survey (data collection)

4) Data input

5) Analysis and interpretation
Identification of attributes and assignment of levels

**General Characteristics of Factors and Levels**

In this stage of the study design, characteristics related to the specification of factors and levels were addressed. In general, the factors and levels included in the DCE must first be communicable, meaning they should be easily conveyed and presented in a realistic fashion. If respondents had been unsure about the nature of the attributes being evaluated, the results may not be a true reflection of their preference structure. This study included the presentation of the attributes in the form of a mentoring program description, including the previously identified relationship attributes that could comprise the structural aspects of the program.

In addition to being communicable, the factors and levels also had to be actionable. This means that they must be distinct and concise, allowing for ease of implementation of the concept. If respondents were uncertain about how one attribute compared to another, the task again may not be a true reflection of the preference structure. This study used precise terms to describe the attributes and levels in order to avoid “fuzzy” factors (Hair, 2010).

The actual specification of the factors and levels was arguably the most important stage in the design of the DCE. In this selection, the number of both the factors and levels was considered as well as considerations specific to each factor or level were individually evaluated. When individuals responded to choices, it was assumed they were considering all of the attributes and making trade-offs among them. If too many attributes and levels had been included, individuals may not have considered all the information and may have adopted simple decision-making strategies to make their decisions.
Factors

The factors included represented specific attributes upon which judgments or preferences of the respondent were based. The factors chosen for this study were derived from both existing literature as well as the preliminary exploratory research with student pharmacists. From the literature, the following factors have been evaluated with respect to mentorship:

- Origin of the relationship
- Method of communication
- Length of the relationship
- Frequency of contact
- Outcomes of the mentoring relationship

When developing a mentorship program, deciding how to combine these “structural” attributes is essential and may result in different outcomes.

Levels of Attributes

Levels were the measures that comprise the stimuli (Hair, 2010). Like the attributes, it was important to ensure the levels were also communicable and actionable. Additionally, the number and range of the levels was considered. Although it was unlikely to have the exact same number of levels for each attribute, attempting to make them as even as possible was important.

For this study, preliminary research led to a good balance of levels across each of the attributes. Four of the five attributes had two levels and the remaining attribute had three levels. Beyond the number of levels, another consideration for DCE was the range of the levels. They were designed to not be too extreme so that the scenarios would still be realistic. Below are the factors and levels used in this study based on the information found in the literature.
1. Factor: Origin of the relationship
   Levels: Assigned
   Unassigned

2. Factor: Method of communication
   Levels: In-person
   Online/virtual

3. Factor: Length of the relationship
   Levels: Short-term (6-12 months)
   Long-term (2-5 years)

4. Factor: Frequency of contact
   Levels: Weekly
   Monthly
   Once per semester

5. Factor: Outcome of the relationship
   Levels: Professional development
   Personal development

Stimuli Set Construction

Defining Subsets – Fractional Factorial Design

In this research, the number of factors and subsequent levels resulted in an overwhelming number of possible combinations. Because the proposed research included varying numbers of levels across the attributes, the number of possible relationships was determined using the equation $a^n \times b^m$ where $a$ and $b$ were the different attribute levels and $n$ and $m$ were the different
attributes. For this research, the number of possible profiles was \(2^4 \times 3^1 = 48\). Also, in the DCE choices were presented in choice sets involving two options. This resulted in \(\frac{48 \times 47}{2} = 1,128\) unique choice sets that could be created using the profiles.

Presenting respondents with all possible choices is known as a full factorial design, but this was not possible because there were too many choice sets. Because of this, a fractional factorial design was used to develop the most appropriate set of stimuli to be tested. This approach was the most common method for defining a subset of stimuli and involved the development of a sample of possible profiles. Keeping the number of choices subjects responded to manageable and realistic was important so they didn’t get tired, bored, or unmotivated.

To choose an experimental design that accommodated the fractional factorial set, the SAS statistical program was used. After specifying the list containing the number of levels of each factor, the %MktRuns autocall macro was used to choose the number of choice sets and to generate a list of various reasonable design sizes. The preferred design was orthogonal and balanced, meaning the attributes were statistically independent of one another and the levels of the attributes appeared an equal number of times. For this study, two reasonable design sizes, one with twelve choice sets and one including twenty-four choice sets, were presented. The design size including twelve choice sets was utilized in this study so as not to unnecessarily lengthen the survey instrument and to prevent survey fatigue among the respondents.

After choosing the design size with twelve choice sets, the next step was to design the choice experiment using the %MktEx macro, which generated an efficient design. The %MktEval macro was then used to produce a matrix of canonical correlations between the factors. This matrix was evaluated to determine the goodness of the overall design. Finally, the design was tested prior to data collection to ensure it worked. This was done using the
%ChoicEff macro which produced a table with the name and label of each parameter along with its variance, $df$, and standard error. This table was evaluated to ensure that the variance and standard errors were of approximately the same order of magnitude.

Data Collection Design

Following the selection of the design, the choice sets were built using Qualtrics® Online Survey Software. For each choice set containing two relationship profiles, respondents were asked to indicate which mentoring relationship structure they preferred.

Further Development of the Survey Instrument

The preliminary qualitative research played a significant role in the development of the survey instrument, but the measurements and profile preference task described thus far did not constitute the entirety of the instrument. Additional information was included in the final questionnaire to elicit pertinent information associated with mentoring from the participants.

In order to allow for an accurate description of the responding sample, demographic information was collected. Although some resources recommend clustering all demographic information together and including the section at the end of the questionnaire (Alreck and Settle, 2004), this instrument included this information at the beginning due to the importance of the answers to these questions in characterizing the respondent pool and providing data for inferences about the respondents themselves. Demographics of interest included age, gender, ethnicity, institution, and professional year in school.

An additional section of the questionnaire included questions aimed at identifying past experiences with mentorship. Students were provided a definition of the term “mentorship” and
were asked if anyone someone, past or current, fulfilled this role in their lives. Students were also be asked whether or not their institution offered a mentorship program and if so, the general structure of the program.

Field Pretesting the Instrument

Pretesting the survey instrument was critical to this study as it allowed for the identification of potential problems with wording, ordering, and formatting (Singleton & Straits, 2010). Prior to distribution of the finalized survey, a draft version was presented to a group of individuals for critique. This group was comprised of a convenience sample of recently graduated students and faculty members who have familiarity with the content of the survey but were not included in the sample used in the study. The group was asked to identify clarity issues in the instructions as well as the questions themselves. They were also asked to provide comments on the flow of the document and the usefulness and applicability of each section of the survey instrument. Constructive comments were incorporated into the final version of the survey.

SAMPLING

Population and Study Sample Selection

As of January 2019, there were 142 schools and colleges of pharmacy in the United States, and the estimated enrollment as of fall 2018 was 62,504 students (AACP, 2019). In order to obtain a diverse sample, variation in the population was considered. Differences that were considered important to this study were current year in the professional program (P1-P4), campus structure, and geographic location. In terms of campus structure, a combination of both private and public institutions was desired for this study. To account for the desired diversity, a
purposive sampling design using a convenience sample was utilized (Singleton & Straits, 2010) when selecting the small sample of four institutions. Approximately 1,500 potential respondents could be gathered from these institutions, thus requiring a minimum sample size of 300 for the study. Approval from the Institutional Review Board at each institution was obtained.

**DATA COLLECTION AND PROCESSING**

Due to the complex design of the study, surveys were distributed to all students via Qualtrics® Online Survey Software. School email addresses for students in their first through fourth professional years were utilized. Survey distribution began in January 2019. A professional colleague at each school or college of pharmacy was responsible for sending the emails to the students at their respective institutions. The online survey remained active for two weeks and all participants received two reminder emails.

**DATA ANALYSIS PLAN**

All analyses, except for the DCE, were conducted using SPSS. Analysis of the DCE data was conducted using SAS. First, an analysis of the overall dataset was conducted to examine the data with the intention of identifying outliers and errors. Descriptive statistics were performed on demographic variables to describe the sample of respondents. Subsequent analysis was performed with regard to each individual objective and its related hypothesis.

**Objective 1:** To quantify the level of value assigned to mentorship among student pharmacists and explore the potential factors that influence this value.

H₁₀: The level of value assigned to mentorship does not differ based on level of involvement.
\(H_{1bO}: \) The level of value assigned to mentorship does not differ based on experience with mentorship.

\(H_{1cO}: \) The level of value assigned to mentorship does not differ based on future postgraduate intentions.

The first question posed here to be answered was “what level of value does each student pharmacist assign to mentorship?” This was addressed using the composite score from the adapted Mentoring Functions Scale as well as a single item which asked respondents to rate how important they find mentorship on a scale of 1 to 10 in which 1=not at all important and 10=extremely important. To identify the potential influence of other factors in this valuation, items related to experience with mentorship, future postgraduate plans, and level of involvement, or perceived personal relevance, were also examined.

To evaluate how the value of mentorship changed based on potential influences, regression analysis was used in which the dependent variable was the mentorship value score and the independent variables included involvement score, experience with mentorship, and future postgraduate plans. Demographic variables including age, gender, year in school, and type of institution were also included in the regression model.

**Objective 2:** To measure the value of individual mentorship functions and how this perceived value influences the decision to participate in a mentoring relationship.

\(H_{2aO}: \) The value of mentorship functions has no influence on likelihood to participate in a mentoring relationship.
First, to evaluate the value of individual mentorship functions, the Mentoring Functions Scale was used. This scale provided individual measures of value for each of the 29 functions, and from this, an average value score on each of the nine subscales, five in career functions and four psychosocial functions, was calculated for each respondent. Regression was then used to predict likelihood to participate in a mentoring relationship using the average scores on the two categories, career functions and psychosocial functions, as predictors. A p-value of <0.05 was considered statistically significant.

**Objective 3:** To assess the preferences for the structure of the mentoring relationship among student pharmacists.

H$_{3O}$: Preferences for the structural attributes of mentoring relationships are consistent for all student pharmacists.

Student preferences for the structural attributes of the mentoring relationship were evaluated using a DCE. A multinomial logit model was used to assess student preferences for mentorship structure with respondent choice coded as the dependent variable and the hypothesized factors as the independent variables. Because each respondent participated in several choice tasks, the analysis accounted for the within-person correlation. The fit of the model was done using the SAS procedure PHREG.
CHAPTER 4
DATA ANALYSIS AND RESULTS

RESPONSE RATE

Utilizing email distribution of an online Qualtrics survey link, a total of 1,426 survey emails containing access to the survey were distributed. From this sample, a total of 370 responses were received (25.9%). Of the 370 responses, a total of 44 were considered incomplete and were excluded from analysis. One additional case with a singular demographic response was removed from analyses. The 325 remaining survey responses represent a response rate of 22.8% based on enrollment numbers at each institution (n = 1426).

DESCRIPTION OF RESPONDING SAMPLE

The majority of the respondents were female students (73.8%) and white/Caucasian (80.9%), with an average age of 24 years. These demographics are similar to the overall student pharmacist population which is also majority female and white/Caucasian (AACP, 2016). Among the four schools included in the sample, most respondents were in the third professional year (P3) of the pharmacy curriculum. More detailed descriptions of the respondent sample can be found in Table 2. The percentages reported in these tables represent percentages of total responses to each question and do not equal the total number of questionnaires received (n=325) due to missing information for some responses.
Age was collected as absolute numerical data (see Question 2, Appendix C) but collapsed into four categories for subsequent analysis. These bounds were set based on the desire to categorize as “early twenties/thirties” versus “later twenties/thirties” as these could be considered younger vs. older students.
<table>
<thead>
<tr>
<th>Table 2. Demographic Information for Responding Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Male n=84(25.8%)</td>
</tr>
<tr>
<td>Female n=240(73.8%)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
</tr>
<tr>
<td>19-23 n=163(50.8%)</td>
</tr>
<tr>
<td>24-28 n=132(41.1%)</td>
</tr>
<tr>
<td>29-33 n=17(5.3%)</td>
</tr>
<tr>
<td>34 years or older n=9(2.8%)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
</tr>
<tr>
<td>White/Caucasian n=263(80.9%)</td>
</tr>
<tr>
<td>Black/African American n=16(4.9%)</td>
</tr>
<tr>
<td>Hispanic/Latino n=10(3.1%)</td>
</tr>
<tr>
<td>Native American/American Indian n=1(0.3%)</td>
</tr>
<tr>
<td>Asian/Pacific Islander n=30(9.2%)</td>
</tr>
<tr>
<td>Other n=3(0.9%)</td>
</tr>
<tr>
<td><strong>Year in School</strong></td>
</tr>
<tr>
<td>P1 n=80(24.6%)</td>
</tr>
<tr>
<td>P2 n=80(24.6%)</td>
</tr>
<tr>
<td>P3 n=94(28.9%)</td>
</tr>
<tr>
<td>P4 n=68(20.9%)</td>
</tr>
<tr>
<td><strong>Institution</strong></td>
</tr>
<tr>
<td>University of Mississippi n=174(53.5%)</td>
</tr>
<tr>
<td>Idaho State University n=71(21.8%)</td>
</tr>
<tr>
<td>St. John’s Fisher n=50(15.4%)</td>
</tr>
<tr>
<td>Butler University n=30(9.2%)</td>
</tr>
<tr>
<td><strong>Postgraduate Plans</strong></td>
</tr>
<tr>
<td>Community Pharmacy n=86(26.5%)</td>
</tr>
<tr>
<td>Hospital Pharmacy (no residency) n=28(8.6%)</td>
</tr>
<tr>
<td>Residency Training n=185(56.9%)</td>
</tr>
<tr>
<td>Graduate School n=8(2.5%)</td>
</tr>
<tr>
<td>Fellowship Training n=8(2.5%)</td>
</tr>
<tr>
<td>Other n=10(3.1%)</td>
</tr>
<tr>
<td><strong>Current or Past Mentor</strong></td>
</tr>
<tr>
<td>Yes n=253(77.8%)</td>
</tr>
<tr>
<td>No n=41(12.6%)</td>
</tr>
<tr>
<td>Unsure n=31(9.5%)</td>
</tr>
<tr>
<td><strong>Institutional Mentorship Program</strong></td>
</tr>
<tr>
<td>Formal program with assigned faculty mentors n=175(53.8%)</td>
</tr>
<tr>
<td>Formal peer mentorship program n=58(17.8%)</td>
</tr>
<tr>
<td>Informal program with no assigned mentors n=52(16%)</td>
</tr>
<tr>
<td>Other n=14(4.3%)</td>
</tr>
<tr>
<td>No program exists at my school n=45(13.8%)</td>
</tr>
<tr>
<td>Unsure n=61(18.5%)</td>
</tr>
</tbody>
</table>
Another topic of great interest was students’ experience with mentorship. Students were provided with a definition of mentorship created from the results of the exploratory qualitative phase of the study (see Appendix A) and based on this definition they were asked to identify whether someone has fulfilled that role for them as either a current or past mentor. Students were also asked to identify whether or not a mentorship program was provided by their institution, and if one was available to them, what type of program it was. When identifying the institutional mentorship programs available, students were able to select all options that applied. Some students identified multiple options available at their institutions.

The majority of students (77.8%) reported some form of either past or current mentor, and most students also reported exposure to a mentorship program at each of their respective institutions. For the four schools included in the study, a variety of mentorship programs are available at all institutions. Student perceptions of the type of program provided at their institutions were considered important when evaluating experience with mentorship. Most students (53.8%) reported that their school provided a formal mentorship program with assigned faculty mentors while several students also reported formal peer mentoring programs or more informal types of mentoring programs in which students were not paired with a mentor but had the ability to choose someone based on the factors they deemed important. When considering which program types were available, respondents were instructed to “choose all that apply” resulting in some students choosing more than one type of mentoring program and allowing for percentages that were over 100%.
EXAMINATION OF RESEARCH OBJECTIVES

Objective 1: To quantify the level of value assigned to mentorship among student pharmacists and explore the potential factors that influence this value.

“What level of value does each student pharmacist assign to mentorship and what factors influence this value?” To measure the value of mentorship among student pharmacists, an adapted version of the Mentoring Functions Scale (MFS) was used (Noe, 1988). The average value score, as measured by the MFS, was reported as 8.56 (SD=1.14) using the 10-pt scale. This indicates that on average, students felt that the mentoring functions presented to them in this research were valuable. Scores ranged from 1 on the low end to 10 on the high end. In addition to this average mentorship value score, overall value was also assessed with a single global item on a 10-pt scale where 1=not important at all and 10=extremely important to check for validity of the instrument. Students reported an average value on this scale of 8.25 (SD=1.60), similar to the mentoring functions score reported via the Mentoring Functions Scale.

To evaluate how the value of mentorship changed based on potential influences, multiple regression analysis was used to investigate whether future postgraduate plans, experience with mentorship, and perceived personal relevance (involvement) score could significantly predict students’ average mentorship value scores on the MFS. The demographic variables professional year in school, age, and gender were also included in the model.

The results of the regression analysis can be found in Table 3. Experience with mentorship contributed significantly to the model (β=0.575, p<0.0001) as did involvement score (β=0.038, p=<0.0001) and professional year in school, specifically the P4 classification (β=-0.392, p=0.028). The only demographic variable that contributed to the model was age (β=0.042, p=0.022).
Table 3. Summary of Multiple Regression Analysis for Mentorship Value Score

<table>
<thead>
<tr>
<th>Variable</th>
<th>Co-efficient</th>
<th>SE</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.042</td>
<td>0.018</td>
<td>0.022</td>
</tr>
<tr>
<td>Involvement score</td>
<td>0.038</td>
<td>0.006</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Professional year in school</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P4</td>
<td>-0.392</td>
<td>0.179</td>
<td>0.028</td>
</tr>
<tr>
<td>P3</td>
<td>0.107</td>
<td>0.165</td>
<td>0.517</td>
</tr>
<tr>
<td>P2</td>
<td>0.230</td>
<td>0.170</td>
<td>0.175</td>
</tr>
<tr>
<td>P1 (reference)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.187</td>
<td>0.138</td>
<td>0.175</td>
</tr>
<tr>
<td>Male (reference)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Postgraduate Plans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Further education/training</td>
<td>0.145</td>
<td>0.126</td>
<td>0.249</td>
</tr>
<tr>
<td>No further education/training</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>(reference)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience with mentorship</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.575</td>
<td>0.148</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>No (reference)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

$p < 0.05$

In addition to the regression model, differences in mentorship value scores between various groups were also examined, beginning with demographic variables such as gender, type of institution attended, experience with mentorship, and postgraduate plans. T-tests were performed to examine the differences between these groups, and the results can be found in Table 4.
Table 4. Summary of T-tests for Differences in Mentorship Value Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=76)</td>
<td>8.42 (1.14)</td>
<td>0.243</td>
</tr>
<tr>
<td>Female (n=226)</td>
<td>8.60 (1.14)</td>
<td></td>
</tr>
<tr>
<td>Type of Institution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public (n=230)</td>
<td>8.66 (1.10)</td>
<td><strong>0.008</strong></td>
</tr>
<tr>
<td>Private (n=73)</td>
<td>8.23 (1.19)</td>
<td></td>
</tr>
<tr>
<td>Experience with Mentorship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes (n=237)</td>
<td>8.70 (0.92)</td>
<td><strong>0.003</strong></td>
</tr>
<tr>
<td>No (n=66)</td>
<td>8.05 (1.62)</td>
<td></td>
</tr>
<tr>
<td>Postgraduate Plans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Further education/training (n=189)</td>
<td>8.67 (0.06)</td>
<td>0.05</td>
</tr>
<tr>
<td>No further education/training (n=114)</td>
<td>8.37 (0.14)</td>
<td></td>
</tr>
</tbody>
</table>

**p < 0.05

No significant difference in mentorship value scores was found when comparing males and females (p=0.243). When comparing students based on the type of institution they attended, however, a significant difference was found indicating students at public institutions has a higher average mentorship value score (p=0.008). A significant difference was also found when comparing students based on experience with a mentor. This experience could be defined as either current or past experience with a mentor, and the comparison revealed that students who had experience with a mentor also had higher average mentorship value scores than students with no mentorship experience (p=0.003). Although the mentorship value scores were higher for students who intend to pursue further education/training, such as graduate school or residency training, when compared to students who do not plan to pursue further education/training, this difference was not statistically significant (p=0.05).
Other comparisons were conducted among demographic variables and the mentorship value score. Simple linear regression was used to explore the relationship differences in this score based on age of the respondents, and this analysis revealed that age did not significantly influence the scores ($F_{(1,297)}=0.141$, $p=0.236$). Potential differences in mentorship value scores among students in different professional years were evaluated using ANOVA. The results of this analysis can be found in Table 5. Overall, a statistically significant difference was seen when considering the average mentorship value score among students in different professional years of the pharmacy curriculum ($F_{3,296}=3.105$, $p=0.027$). Upon post-hoc analysis using the Tukey’s HSD method, the difference between classes was seen when comparing students in the fourth year of the professional curriculum with students in the second year. This pairwise comparison revealed a higher mentorship value score for P2 students versus P4 students ($p=0.009$).

Table 5. Difference in Mentorship Value Scores Among Year in School

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>Mean Score (SD)</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year in School</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P1</td>
<td>71</td>
<td>8.57 (0.89)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>76</td>
<td>8.74 (1.01)</td>
<td>3.105</td>
<td>0.027</td>
</tr>
<tr>
<td>P3</td>
<td>89</td>
<td>8.57 (1.13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P4</td>
<td>65</td>
<td>8.22 (1.56)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$p < 0.05$

Perceived personal relevance of mentorship, or involvement, was also examined and considered to be a potential factor that could influence the value of mentorship. This concept was evaluated using the Revised Personal Involvement Inventory (RPII) (Zaichkowsky, 1994), which can be found in Appendix C. As in other research utilizing this validated scale, the scores from each of the 10 items on this instrument were summed to create an overall involvement score for
each respondent. These scores were then categorized as low involvement (10-29), medium involvement (30-50), and high involvement (51-70). The average involvement score was reported as 58.42 (SD=9.58), and the scores ranged from 13-70. This indicates that on average student pharmacists find mentorship highly personally relevant.

Correlation analysis was used to examine the relationship between the involvement score measured by the RPII and the mentorship value score from the MFS. Results indicated an inverse relationship between perceived personal relevance of mentorship and the perceived value of mentorship, \( r (n=299) = 0.382, p<0.0001 \). This suggests that as the perceived value of mentorship increases, the perceived personal relevance also increases.

Finally, evaluating the potential differences for perceived personal relevance (involvement) among students in different years of the professional program as well as those with different postgraduate plans was considered important in this study. For students in different years of the professional program, no statistically significant difference was seen among involvement scores (\( F_{3,304}=0.996, p=0.395 \)). When considering the ranking of involvement scores for these years, however, students in the P2 class had the highest score, followed by students in the P1, P4, and P3 classes respectively. When evaluating the potential difference in involvement scores based on postgraduate plans, a statistically significant difference was seen. In this study, students with intentions to pursue further education/training had a higher involvement score than students who do not intend to pursue further education/training (59.83 [SD=9.01] vs 56.02 [10.06], \( p=0.001 \)).
Objective 2: To measure the value of individual mentorship functions and how this perceived value influences the decision to participate in a mentoring relationship.

When examining the value scores for each individual mentoring function, the most important function mentors should provide to students was identified as “keeps feelings and doubts I share with him/her in strict confidence.” Other highly valuable functions that had scores of nine or greater (on the 10-point scale) included “conveys feelings of respect for me as an individual”, “being able to respect and admire my mentor”, and “demonstrates good listening skills in our conversations.” A complete list of functions and corresponding value scores can be found in Table 6.

These mentoring functions were separated into career functions and psychosocial functions based on the categories found in Kram (1983). Of the 29 functions, 14 were considered career functions or those that prepare the mentee for job attainment or advancement. The remaining 15 functions were considered to be psychosocial in nature and help the development of confidence, competence, and effectiveness, among other traits.

When examining the mentoring functions scores based on the categories in which they belong, the first four functions listed with average scores of 9 or higher were psychosocial functions. Of the first ten scores listed, four were psychosocial and six were career-oriented. When comparing the mentoring function scores for each category, the average score for career functions was 8.6 (SD=1.28) versus a slightly lower average score of 8.49 (SD=1.16) for psychosocial functions.
<table>
<thead>
<tr>
<th>Mentoring Functions</th>
<th>Type*</th>
<th>Subcategory</th>
<th>Mean (SD)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keeps feelings and doubts I share with him/her in strict confidence (n=313)</td>
<td>P</td>
<td>Counseling</td>
<td>9.10 (1.56)</td>
<td>1</td>
</tr>
<tr>
<td>Conveys feelings of respect for me as an individual (n=312)</td>
<td>P</td>
<td>Acceptance-and-confirmation</td>
<td>9.07 (1.49)</td>
<td>2</td>
</tr>
<tr>
<td>Being able to respect and admire my mentor (n=312)</td>
<td>P</td>
<td>Role modeling</td>
<td>9.07 (1.35)</td>
<td>2 (tied)</td>
</tr>
<tr>
<td>Demonstrates good listening skills in our conversations (n=332)</td>
<td>P</td>
<td>Counseling</td>
<td>9.02 (1.49)</td>
<td>4</td>
</tr>
<tr>
<td>Suggests specific strategies for achieving my career goals (n=312)</td>
<td>C</td>
<td>Coaching</td>
<td>8.92 (1.45)</td>
<td>5</td>
</tr>
<tr>
<td>Gives me feedback regarding my performance as a student pharmacist (n=314)</td>
<td>C</td>
<td>Coaching</td>
<td>8.85 (1.52)</td>
<td>6</td>
</tr>
<tr>
<td>Suggests or encourages me to engage in tasks in my work that prepare me for a job or a residency (n=313)</td>
<td>C</td>
<td>Sponsorship</td>
<td>8.85 (1.61)</td>
<td>6 (tied)</td>
</tr>
<tr>
<td>Suggests specific strategies for accomplishing my professional objectives (n=311)</td>
<td>C</td>
<td>Coaching</td>
<td>8.84 (1.52)</td>
<td>8</td>
</tr>
<tr>
<td>Encourages me to prepare for my postgraduate career (n=314)</td>
<td>C</td>
<td>Coaching</td>
<td>8.80 (1.62)</td>
<td>9</td>
</tr>
<tr>
<td>Provides me with support and feedback regarding my performance as a student (n=312)</td>
<td>C</td>
<td>Challenging assignments</td>
<td>8.75 (1.57)</td>
<td>10</td>
</tr>
<tr>
<td>Shares ideas with me (n=314)</td>
<td>C</td>
<td>Coaching</td>
<td>8.71 (1.44)</td>
<td>11</td>
</tr>
<tr>
<td>Conveys empathy for the concerns and feelings I discuss with him/her (n=313)</td>
<td>P</td>
<td>Counseling</td>
<td>8.71 (1.55)</td>
<td>11 (tied)</td>
</tr>
<tr>
<td>Encourages me to try new ways of utilizing my roles as a student and opportunities presented to me (n=314)</td>
<td>P</td>
<td>Acceptance-and-confirmation</td>
<td>8.60 (1.57)</td>
<td>13</td>
</tr>
<tr>
<td>Suggests or encourages me to engage in tasks that present opportunities to learn new skills (n=314)</td>
<td>C</td>
<td>Challenging assignments</td>
<td>8.59 (1.56)</td>
<td>15</td>
</tr>
<tr>
<td>Description</td>
<td>Type</td>
<td>Category</td>
<td>Rating</td>
<td>Rank</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>------</td>
<td>----------------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>Discusses my questions or concerns regarding feelings of competence,</td>
<td></td>
<td>Counseling</td>
<td>8.58 (1.78)</td>
<td>14</td>
</tr>
<tr>
<td>commitment to advancement, relationships with peers and faculty members or</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>work/family conflicts (n=314)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shares personal experiences as an alternative perspective to my problems</td>
<td></td>
<td>Counseling</td>
<td>8.55 (1.64)</td>
<td>16</td>
</tr>
<tr>
<td>(n=314)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advises me through activities that increase written and personal contact with</td>
<td></td>
<td>Exposure-and-visibility</td>
<td>8.54 (1.69)</td>
<td>17</td>
</tr>
<tr>
<td>individuals who may be influential in my future career (n=313)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourages me to finish assignments/tasks or meet deadlines that otherwise</td>
<td></td>
<td>Protection</td>
<td>8.46 (1.84)</td>
<td>18</td>
</tr>
<tr>
<td>would have been difficult to complete (n=313)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encourages me to talk openly about anxiety and fears that detract from my</td>
<td></td>
<td>Counseling</td>
<td>8.39 (1.92)</td>
<td>19</td>
</tr>
<tr>
<td>work (n=314)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduces unnecessary risks that could threaten the possibility of my becoming</td>
<td></td>
<td>Protection</td>
<td>8.34 (1.84)</td>
<td>20</td>
</tr>
<tr>
<td>a pharmacist (n=313)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shares his/her career with me (n=313)</td>
<td></td>
<td>Coaching</td>
<td>8.33 (1.74)</td>
<td>21</td>
</tr>
<tr>
<td>Asks me for suggestions concerning problems I have encountered at school</td>
<td></td>
<td>Acceptance-and-confirmation</td>
<td>8.33 (1.68)</td>
<td>21</td>
</tr>
<tr>
<td>(n=312)</td>
<td></td>
<td></td>
<td>(tied)</td>
<td></td>
</tr>
<tr>
<td>Helps me meet new colleagues (n=313)</td>
<td></td>
<td>Exposure-and-visibility</td>
<td>8.32 (1.81)</td>
<td>23</td>
</tr>
<tr>
<td>Engages with me in informal exchanges/fellowship beyond the mentoring</td>
<td></td>
<td>Role modeling</td>
<td>8.24 (2.12)</td>
<td>24</td>
</tr>
<tr>
<td>relationship (n=313)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Striving to want to be like my mentor when I reach a similar position in</td>
<td></td>
<td>Friendship</td>
<td>8.23 (1.67)</td>
<td>25</td>
</tr>
<tr>
<td>my career (n=313)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provides me with opportunities such as lab work, writing and presenting,</td>
<td></td>
<td>Exposure-and-visibility</td>
<td>8.12 (1.95)</td>
<td>26</td>
</tr>
<tr>
<td>internships, etc. that have increased my contact with people in pharmacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>who may judge my potential for future advancement (n=313)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mentoring Function</td>
<td>Mentoring Function Type</td>
<td>Average Value (Standard Deviation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>-------------------------</td>
<td>-----------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreeing with my mentor’s attitudes and</td>
<td>P</td>
<td>7.78 (1.86)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>values regarding pharmacy careers (n=312)</td>
<td>Role</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shares mutual interests, experiences, etc.</td>
<td>P</td>
<td>7.77 (2.19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>outside the mentoring relationship (n=312)</td>
<td>Friendship</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wanting to imitate the work behavior of my</td>
<td>P</td>
<td>7.48 (1.96)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mentor (n=313)</td>
<td>Role</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>modeling</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Average overall value score (n=303)**  
8.56 (1.14)

*Mentoring Function Type: P=Psychosocial, C=Career  
**Measured on a 10-point scale, where 1= not important and 10= extremely important

Finally, a multiple linear regression analysis was conducted to predict likelihood to participate in a mentoring relationship using each of the Mentoring Functions Scale categories, career functions and psychosocial functions, as predictors. Other variables included in the model were professional year in school, age, gender, postgraduate plans, experience with mentorship, and perceived personal relevance (involvement score). The results can be found in Table 7. Significant predictors of likelihood to participate in a mentoring relationship included gender, postgraduate plans, history with mentorship, and involvement score. When evaluating the career functions and psychosocial functions averages of the Mentoring Functions Scale, neither emerged as a significant predictor of the likelihood to participate in a mentoring relationship.
### Table 7. Summary of Multiple Regression Analysis for Likelihood to Participate in a Mentoring Relationship

<table>
<thead>
<tr>
<th>Variable</th>
<th>Co-efficient</th>
<th>SE</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.023</td>
<td>0.031</td>
<td>0.451</td>
</tr>
<tr>
<td>Involvement score</td>
<td>0.075</td>
<td>0.011</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Career functions average</td>
<td>0.199</td>
<td>0.165</td>
<td>0.226</td>
</tr>
<tr>
<td>Psychosocial functions average</td>
<td>0.163</td>
<td>0.167</td>
<td>0.327</td>
</tr>
<tr>
<td>Professional year in school</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P4</td>
<td>0.071</td>
<td>0.299</td>
<td>0.813</td>
</tr>
<tr>
<td>P3</td>
<td>-0.223</td>
<td>0.274</td>
<td>0.416</td>
</tr>
<tr>
<td>P2</td>
<td>-0.149</td>
<td>0.282</td>
<td>0.597</td>
</tr>
<tr>
<td>P1 (reference)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>0.460</td>
<td>0.229</td>
<td>0.045</td>
</tr>
<tr>
<td>Male (reference)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Postgraduate Plans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Further education/training</td>
<td>1.087</td>
<td>0.211</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>No further education/training (reference)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Experience with mentorship</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0.537</td>
<td>0.251</td>
<td>0.032</td>
</tr>
<tr>
<td>No (reference)</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

*p < 0.05

**Objective 3:** To assess preferences for the structure of the mentoring relationship among student pharmacists.

A discrete choice experiment was conducted to investigate student pharmacists’ preferences for structural attributes of a mentoring relationship. Included in the analysis were five factors, each representing a component of the relationship deemed important by the students who completed the qualitative exploratory phase of the research. These five factors included how the relationship is formed, the type of communication used within the mentoring relationship, how frequently the mentor and the mentee meet, how long the relationship should last, and the desired outcomes of the relationship for the student.
Discrete choice experiment results can be found in Table 8. Four of the five attributes were significant to the choice of mentoring relationship structure: how the relationship was formed ($p<0.0001$), the type of interaction ($p<0.0001$), the duration of the relationship ($p<0.0001$), and the frequency of contact when comparing weekly to monthly contact ($p<0.0001$). Within these significant attributes, students indicated preferences for long-term mentoring relationships formed with unassigned mentors and consisting of in-person, monthly meetings. When comparing weekly versus once per semester meetings, students preferred once per semester although it was not statistically significant. Also, when comparing the potential outcomes of the relationship, personal development versus professional development, students prefer professional development but again it was not statistically significant.
LIMITATIONS OF THIS RESEARCH

Issues Related to Response

As might be expected, the use of an online survey in this study yielded a low response rate compared to what may have been seen if a paper survey administered in-person had been utilized. One possible reason for this included the variability in when respondents could complete the online version. Rather than being asked to complete the survey at a specified time, in a class setting, respondents could complete the survey on their own time during the 2-week period the survey was available. This likely decreased the number of students completing the online survey because they could open the email and then either choose to not participate or to close the message, but then forget to follow up or complete the survey at a later date. Although two reminder emails were also distributed, it is likely that some students planned to participate but did not remember to follow through. Additionally, one institution was unable to send out the reminder emails due to administrative restrictions, resulting in an even lower response rate from their students.

Another factor which may have contributed to the low response rate is the fact that students received an email from the primary researcher, someone whom many of them had never met. In an attempt to make the message more personal, a video introduction was included in the email asking for participation. The email was also distributed directly from a professional contact.
at each individual institution so the students would receive the request from an individual they recognized rather than a virtual stranger. Although these efforts to engage the students may have worked for some, they may not have worked for others and the impersonal nature of the study may have had a negative impact on the response rate.

Additionally, it is possible that the nature of the topic itself, mentorship, contributed to a reduced response rate. In the event that students received the recruitment email and decided that they either did not care about mentoring or did not find it relevant to them, they could have chosen to not participate in the study. This could have potentially introduced response bias if those students who were not interested in the topic of mentoring did not complete the survey.

Lastly, a potential limitation in this research involves generalizability of the findings. Although the four schools used in this project were chosen to represent the most common types of institutions as well as a variety of regions of the country, the results may not generalizable to all student pharmacists in the United States.

Identification of Past Mentorship Experience

Another potential limitation to this research could be related to the way in which students were asked to identify whether or not they had experience, either current or past, with mentorship. In this study, students were provided with a definition of mentorship, derived from feedback provided during the in-depth interviews, and then asked if someone has fulfilled that role for them as either a current or past mentor. While the majority of the students said that yes, they had someone who met the definition provided, 12% reported that no, they did not have experience with a mentor and almost 10% were unsure. It is unclear from this study if the students truly do not have a mentor in their professional lives or if the definition provided maybe
did not adequately explain the type of mentorship with which they were familiar. For some students, they actually may have a mentor of sorts, but he/she may not fit the description provided so the respondent may not have answered “yes” to that question.

Also, although the definition of a mentor was provided to the students, some may not be familiar with this terminology because the mentorship programs at their respective institutions may not use the word “mentor”. In speaking with representatives from each school, it became clear that other terms, such as “advisor” may be used to describe the same type of role. This could have created confusion for the respondents and resulted in them not recognizing the mentors they may have available to them.

Finally, this study did not differentiate whether the mentoring experience was positive or negative for the students. The type of experience could influence the perceived value students attribute to mentoring relationships. Also, it is possible that students who had negative experiences may have avoided completing the survey altogether, introducing potential response bias.

**Generalizability of the Discrete Choice Experiment**

One potential limitation with the DCE is that the results are only applicable to the factors and levels used in this study. The mentoring relationship scenarios chosen for comparison included a limited number of factors, and although these factors were derived from students’ responses during the qualitative phase of the research, it is possible that other important aspects of the mentoring relationship exist. As such, the interpretation and discussion of the results from the DCE are limited to the factors and levels included.
Mentoring Functions Scale Development and Application

The Mentoring Functions Scale used in this study was adapted from an existing measure (Noe, 1988). The original Mentoring Functions Scale was developed for the use in the business domain and focused a great deal on the relationship between a superior manager or higher-level administrator and a more entry-level “trainee” or “apprentice”. Although some similarities may exist in those relationships and the mentor-mentee relationships in the pharmacy education realm, there are also differences. To my knowledge, the existing scale has not been used in the pharmacy education setting to evaluation mentorship. The adaptations made for this study created a scale better suited for the pharmacy education setting, particularly in the individual institutional settings in which mentorship programs may exist. It is not known what limitations may have accompanied the modified scale, beyond untested validity and reliability of the new form in this novel context. Such limitations may be decreased with repeated use and further adjustments to improve the ability to identify the mentorship functions that students most desire mentors to perform.

Another potential limitation with the scale could be the wording of the functions themselves. The original scale included functions that were worded to pertain to mentorship in business relationships, but the wording of each function in the scale used in this research was adapted to make it more relevant to mentoring in pharmacy education. It is possible that terminology or the explanation used was not interpreted as intended.
DISCUSSION

Postgraduate Plans

For this study, just over half of the respondents (56.9%) indicated intentions to pursue residency training after completion of the PharmD curriculum. When comparing the percentage of P4 students with residency intentions (23.9%) to data from a study conducted by AACP in 2018, in which 29% of respondents indicated intentions to pursue postgraduate pharmacy residency training, this percentage is slightly lower than the national average (AACP, 2018). Overall the number of students intending to complete a residency did not differ significantly across the four years of the pharmacy school curriculum (P1=40, P2=47, P3=53, P4=44) although the numbers of P2 and P3 students indicating this postgraduate path were slightly higher compared to first and final year students. This may be due to the fact that students in the second and third years of pharmacy school are considering all possibilities and may indicate an interest in residency training but have not had to make an actual decision yet and may not know much about the implications of that choice. Comparatively, first year students have likely not focused much attention on postgraduate plans while students in their final year of the curriculum have already likely decided on the next steps following graduation.

The postgraduate plans of respondents in this study follow the same pattern as the national data in which the most common postgraduate path for students is pursuing residency training while the second most commonly reported path was taking a position in a community pharmacy. When comparing the percentage of respondents in this study with community pharmacy intentions, the percentage is much lower than what is reported from a national perspective. For this study, 26.5% of respondents indicated plans to work in the community pharmacy setting upon graduation, with 19% of these students being P4 students. According the
2018 AACP study, over half of the graduating students (52.1%) indicated plans to work in the chain community pharmacy setting and 20.8% indicated plans to work in the independent community setting. Perhaps the reason for this difference lies in potential response bias. For students who plan to pursue community pharmacy careers, it is possible they did not find as much relevance in the study compared to students with intentions to complete residency training. Although community practice residencies exist as postgraduate opportunities, they are far fewer in number than health-systems or institutional residencies and pharmaceutical sciences graduate programs (ACCP, 2019). Also, some schools provide programming in the form of residency interview preparation (Caballero et al., 2012; Koenigsfeld et al., 2012), student-organization led residency preparation programs (Rider, Oeder, Nguyen, & Rodis, 2014), and resources to help with the residency search process (Prescott, 2010), which could all include several of the mentoring functions described in the MFS. It is unclear if similar resources are available to students with other career plans, but it is possible that students not intending to pursue residency training may not be aware of potential mentoring opportunities and therefore may not find as much value in mentoring relationships.

In addition to evaluating postgraduate paths individually, this study also collapsed the options into two main categories: “further education and training” and “no further education and training”. This classification revealed that 201 students (61.8%) intend to pursue postgraduate education or training compared to 124 students (38.2%) do not have these intentions. This is not surprising given that residency training is the most common path seen in this study and is included in the “further education and training” category.
Experience with Mentorship

Following the preliminary interviews and online focus group, a definition of mentorship was developed and provided by the students. This definition is as follows:

“the provision of guidance, support, and advice in order to enhance both the personal and the professional development of a mentee. In this relationship, the mentor often provides support based on personal experience, but encourages the mentee to create goals based on personal interests and aids in the achievement of these goals.”

As previously mentioned, the majority of respondents indicated having experience working with a mentor, either currently or in the past. There were, however, several students who indicated they had either no experience with a mentor or they were unsure if someone had fulfilled that role. Although no follow-up questions were included to further explore whether students truly had not received mentorship or if they were unsure due to a difference in terminology, it is still interesting that some students feel like a mentoring relationship was lacking—at least in the professional context. The preliminary exploratory research did reveal that some students have “mentors” in their lives, although they had never used that terminology despite the fact that this individual may perform all the same functions as a mentor.

Another way mentorship experience was measured in this study was by asking students to indicate which type or types of mentorship programs are available to them through their institutions. Examples provided included “formal program with assigned faculty mentors”, “formal peer mentorship program” and “informal program with no assigned mentors” that may be provided by student organizations or developed organically. Students were also able to indicate if a different type of program was available that was not listed, no program was available, or if they were unsure.
Again, it is interesting to examine the responses with regard to what students perceive to be available to them. This question allowed for a “check all that apply” answer, so some students indicated a combination of mentorship programs available at their institution. But for the most part, students indicated just one type of program, most commonly a formal mentorship program in which students were assigned faculty mentors. The second most commonly reported mentorship program was one provided by the institution in which students were given peer mentors. Interestingly, 13.8% of respondents indicated that no program was available at their school, and several others (18.5%) were unsure of the availability of a mentorship program.

When asked about the availability of programs at each school, the professional contacts who helped with the study indicated some form of mentorship is available to the students at each of the institutions. Some opportunities are more formal and structured by the institution while others may be more informal and require the student to reach out and take advantage of the mentorship opportunity. Regardless, all institutions offer some form of mentorship, making it interesting that several students indicated no program was available. For students who maybe aren’t as eager to participate in a mentoring relationship, it may not be as readily evident that opportunities for this kind of support are available. Also, in the case of peer mentorship programs, if they are not structured and delivered in a systematic way, some may be more successful than others depending on how well they are implemented by the students involved. If it is not evident to students that a successful and clear mentorship program is available, they may be under the impression that no such opportunity exists. Another potential area for misunderstanding is with the terminology used. Some programs may refer to their “mentors” as “advisors”, which may have a different meaning for students. The potential for this misunderstanding highlights the importance of communication with regard to the availability of
mentoring programs. With clear and detailed descriptions of mentorship opportunities, students would be better able to interpret what is available to them and pursue mentoring relationships they find relevant and rewarding.

Value of Mentorship

*Mentorship Value Scores*

One of the main objectives of this study was to not only examine whether students are aware of the existence of mentorship opportunities, but to also measure how much value students assign to mentorship and how different factors may influence this value. Value is often measured alternatively as importance, and this study employed both terms to evaluate the concept of mentorship value. In this study, value was measured using both a composite score on the adapted Mentoring Functions Scale (Noe, 1988) as well as a single item directly asking students how important they perceive mentorship to be overall.

When evaluating the mentoring function scores provided by the respondents, the average score assigned to mentorship was reported as 8.56 (SD=1.14) on a 10-pt scale in which 1=not important and 10=extremely important. The scores ranged from 1 at the lowest to 10 at the highest, and almost 75% of the scores reported were 8 or higher. This relatively high importance score shows that students find mentorship to be important, particularly when examining the functions that a mentor can perform within the mentoring relationship.

Although not proposed for this research, a single global item was also included in the survey as a validity check to measure the overall perception of mentorship value. For this item, students were asked to indicate how important they found mentorship on the same 10-pt scale used for measuring the individual functions. When evaluating the average value score provided
by the global item, it was similar to that provided by the scale scores at 8.25 (SD=1.60). The range of scores again was 1 at the lowest and ten at the highest, and over half of the respondents indicated a score of eight or higher. This is encouraging data as it shows that students not only recognize but also value these relationships.

Factors Influencing Mentorship Value Scores

In addition to measuring the overall value of mentorship, it was important in this study to examine potential factors that may be influencing this value. The factors evaluated included postgraduate plans, experience with mentorship (both discussed previously), and perceived personal relevance (involvement). The potential influence of age, gender, and year in school was also examined. Of these factors, age was a significant contributor to the mentorship value score, which increases as age increases. Professional year in school was also a significant predictor, although it was noted that P4 students had, on average, lower value scores than students in the P1 class. It is possible that for students in their P4 year, they may feel as if they have already decided on a career path and at that point, a mentor may not be as beneficial compared to the P1 year when they are just starting to figure out their paths.

Two other statistically significant contributors to the mentorship value score were experience with mentorship and perceived personal relevance (involvement). For experience, this study revealed that as students move from the category of “no mentorship experience” to the category indicating “current or past mentorship experience”, it can be predicted that their mentorship value score will increase. A positive relationship between perceived personal relevance and mentorship value was also seen and indicated that for every one-point increase in the involvement score, the mentorship value score also increased by 0.038. Again, these results
are not surprising given that students who find mentorship relevant to their future goals would place more value on the mentorship relationship than someone who feels as if mentorship is not needed to help them achieve their goals.

Additionally, although not proposed, a factor analysis was performed using the 29 functions in the adapted Mentoring Functions Scale to analyze whether the functions loaded on factors similar to the categories previously discussed. Surprisingly, this analysis yielded results in which the items loaded on four factors, rather than the two categories identified in the original Mentoring Functions Scale. This discrepancy may indicate the scale is not measuring mentorship value in the same way for the student pharmacist population and points out the need for further examination of the functions desired by student pharmacists and the subsequent development and testing of a functions scale that is better adapted to the pharmacy education setting.

*Differences in Mentorship Value by Demographics*

Although comparisons within most demographic variables did not show significantly different mentorship value scores, there were some slight differences that could be further explored. Both males and females appear to place similar levels of value on mentorship, regardless of age. When considering year in school, students in their second professional year (P2) appear to value mentorship the most as evidenced by the highest mentorship value score via the MFS, while students in their final year (P4) of pharmacy school provided the lowest mentorship value score, a difference that was statistically significant. One potential explanation for this could be that the majority of students in the last year of the professional program have likely decided on their future career paths and do not value the input of a mentor as much as students in earlier years. For students in the second or third years of pharmacy school, mentoring
relationships may appear to be more valuable as they are making important postgraduate decisions.

A difference in mentorship value scores was also seen when comparing students currently enrolled in public institutions versus those enrolled in private institutions. In speaking with the professional contacts at each of the participating schools, it seems that more structured mentorship opportunities are available at the two public institutions when compared to the two private schools. Students from the public schools may perceive mentorship to be more readily available, potentially resulting in increased value.

Differences in Mentorship Value among Postgraduate Plans

Among this student sample, very few differences were seen when comparing value, as measured by the Mentoring Functions Scale, among different postgraduate plans. As previously mentioned, postgraduate options could be easily divided into two categories and were collapsed for analysis. The average mentoring function score for students with plans to complete further training (8.67) was higher than the average score for the students without plans to pursue further training (8.37), although not statistically significant. One possible explanation for this could be that students who intend to pursue postgraduate training may feel that they need help in obtaining those positions, particularly from people who have followed the same path. The guidance and advice a mentor can provide may be appealing to these students as they navigate an unknown area. For students not intending to pursue additional postgraduate education or training, the targeted help from a mentor may not be as important to them. While in pharmacy school, some of these students may have already been working in the setting they intend to pursue after
graduation, potentially causing them to feel as if they can “figure it out” on their own, without the help of a mentor.

Difference in Mentorship Value by Experience with Mentorship

Another comparison deemed important in this study was the difference in the perceived value of mentorship among students with past or current experience with a mentor. When evaluating the composite scores provided by these two groups of students, those with mentorship experience had a higher average value score than those with no mentorship experience. It is likely that students with mentorship experience have seen first-hand the positive impact a mentor can have on their lives and value that influence. For students who do not have experience with a mentor, it is likely they may not understand all that a mentoring relationship can provide since they have not had that personal experience. In those instances, students may not realize what they are missing and therefore don’t value what they don’t fully comprehend.

Perceived Personal Relevance of Mentorship

One concept included in this study as a potential influencing factor on mentorship value was that of “involvement”, or perceived personal relevance. This concept was borrowed from the marketing literature for application in pharmacy education as a way to evaluate how relevant students feel mentorship is for them individually. When examining the responses provided on the Revised Personal Involvement Inventory (RPII) (Zaichkowsky, 1994), a composite score was used and these scores were categorized into low (10-29), medium (30-50), and high involvement (51-70) based on involvement literature. From the average involvement score of 58.42 (SD=9.58) and a range of scores from 13 – 70, it appears that most respondents found
mentoring to be highly relevant to them. Within this range, 85% of respondents who completed this section had an involvement score between 51 and 70, the high involvement range.

As discussed earlier, the mentorship value score and involvement score have a positive relationship in which an increase in one is correlated with an increase in the other, a result which is not surprising. Results from the preliminary qualitative research indicated that students identify mentorship as “essential to their future career goals”. With this in mind, if students perceive the input, guidance, and advice of a mentor to be vital, it is also possible that they may find the functions a mentor can provide to be valuable in meeting their goals, both personal and professional.

It is also interesting that the perceived personal relevance of mentorship did not differ significantly across classes. The average involvement score for students in their second professional year of the pharmacy program was slightly higher than the other years, but the difference was minimal. This is somewhat different from what may have been expected in terms of perceived personal relevance which included a potential increase in relevance as students mature through the program and develop a better idea of their future career intentions. Further exploration of relevance with regard to maturation in the program would be beneficial and could help schools to better decide which forms of mentorship would be most impactful to students throughout the professional program.

The perceived personal relevance scores did differ significantly between students with different postgraduate plans, however. In this instance, students intending to pursue postgraduate education/training had a higher involvement score than students who did not plan to pursue further education/training. This is similar to the comparison made using the function scores in which students with further education/training had slightly higher average mentorship value
scores. Students with continued education/training intentions may find mentorship more relevant due to the unknown nature of these potential experiences and the desire to have the guidance of a mentor in deciding which path to pursue.

**Value of Individual Mentorship Functions**

As previously mentioned, an adapted version of the Mentoring Functions Scale was used to examine the relative importance of a variety of functions that can be performed by a mentor. In the original description of these functions, two main categories, career and psychosocial, were used to differentiate between the nature of the functions. Of the 29 items included in the scale, 13 are labeled as career and the remaining 16 are considered psychosocial. Overall, the average score for the career functions was higher (8.60) versus the average score for the psychosocial functions (8.49) although the difference in the two is minimal.

When evaluating the value scores for each of the functions individually, differences can be seen, but they are minimal. Additionally, the standard deviations for these average value scores are quite large for the majority of the functions and caution should be taken to no attribute undue significance or absolute differences among the functions. When examining these individual functions, however, it is interesting to see that the function with the highest scale average in this study was “keeps feelings and doubts I share with him/her in strict confidence”, a psychosocial function that has little to do with obtaining a desired position and more about being part of a trusting relationship. The second highest scale average was attributed to the function “conveys feelings of respect for me as an individual” which is also psychosocial and does more to describe the nature of the mentoring relationship than it does the outcome that is desired as a result of the relationship. The fact that the first four functions listed are psychosocial shows that
students do value these less career-oriented functions in mentoring relationships and perhaps desire more than just help in finding a job or preparing for a future career. Again, given that all of the mentorship value scores for the individual functions are high, one cannot say that there is any real difference in value between the first and the last functions, but that all of the functions appear to be valuable.

**Likelihood to Participate in a Mentoring Relationship**

Another relationship that was considered important to examine in this research was the potential association of the mentorship value scores and the likelihood to participate in a mentoring relationship. There is a positive correlation between these two variables, indicating that as a student’s perception of mentorship value increases, so does their likelihood to want to participate in a mentoring relationship. Also, when looking at the mentoring functions categories, career and psychosocial, it is interesting that neither was a significant predictor of likelihood to participate in a mentoring relationship. As mentioned previously, it is possible that the Mentoring Functions Scale may not be the ideal measure to use in this population, and a more tailored instrument may yield more accurate results. This notion may also prove true when considering how much this value may influence the likelihood to participate. Further exploration of this desire for mentoring relationships, in light of a more applicable measure of mentorship value, may be needed to better understand what influences a student pharmacist’s decision to pursue mentorship.
Mentoring Relationship Preferences

Overall, the preferred structure of the mentoring relationship corresponds with what may have been expected. For example, when it comes to the preference for how the relationship is formed, students participating in this research indicate a mentoring relationship in which the mentor is unassigned to them is more preferable than one in which the mentor is assigned. In the qualitative exploratory research phase of the study, students indicated the same preference. When given the opportunity to expand on their thoughts regarding assigned mentorship, students expressed a desire to seek out their own mentors in hopes of avoiding a “mentor/mentee mismatch” in which the relationship was not formed organically and perhaps the personalities of the two participants were not ideally matched. Students expressed a desire to avoid this by selecting mentors based on similar career goals and/or personality traits. Although relatively important to students, this particular preference may prove to be a challenge for schools and colleges of pharmacy to incorporate into their mentorship strategies. If the structure of the program includes only unassigned relationships, students who may benefit greatly from mentorship could miss out on the opportunity given the passive approach used with a “choose your own” method. Some students may lack the self-awareness needed to find the “right match” with a mentor and may opt to just go without the guidance instead. Perhaps mentorship programs that assign mentors initially but allow students to change after some time has passed would be beneficial. In this scenario, if a relationship seemed to not be working, the mentor and mentee could part ways and the student could pursue a mentoring relationship that is a better fit.

Secondly, when evaluating the communication method most desired by students, this research indicates that when compared to virtual interactions, students preferred “face-to-face” meetings with their mentors. During the preliminary phases of research, students were divided in
their preferences for in-person versus virtual meetings. In terms of which forms of communication students are generally comfortable with, it seems that students are “okay” with both virtual/online and in-person interactions. But when narrowing down the actual preferred method of communication, many students still seem to desire the more tangible “face-to-face” conversations. This is somewhat surprising given the assumption that the current generation of students appear to be tech-savvy and conduct much of their interactions via virtual means. This does pose the question “what is different about mentoring relationships?” that makes students desire more in-person interactions. It would be interesting to evaluate how many students would prefer a relationship that included both in-person and online meetings, and if the desired topics of conversation differed based on the type of meeting taking place. It is unclear if students may be okay with more casual topics being discussed online while more involved or serious topics being discussed in the face-to-face setting, but this idea is one that warrants further exploration.

Next, student respondents of this research indicated that in terms of how long they would like their relationship to last with their mentor, a long-term short-term relationship of up to 2-5 years is preferable compared to a more short-term relationship of only 6-12 months. This is not surprising, given the discussions that emerged during the initial interviews in which students indicated that a longer relationship would be needed to develop a meaningful mentoring relationship. Students appear to rely on their mentors throughout various aspects of the pharmacy program, and although they may have specific, targeted outcomes in mind, they desire a longer period of time to work toward these goals with the guidance of a mentor. This may be particularly evident for students who engage in relationships where both personal and professional development is desired. More time may be needed for mentors to really “get to know” their mentees and anticipate their needs. More research specifically examining the
duration of the relationship, especially taking into consideration the desired outcomes as well as the roles of the mentor would be interesting.

Student respondents of this research also had interesting responses with regard to their desired frequency of contact with their mentors. When given the choice of weekly, monthly, and once-a-semester meetings, students showed little differentiation for preference between frequent weekly meetings and less frequent semesterly meetings. But of the three options the most preferred was monthly meetings. This may not be extremely surprising given that meeting once a month may be more frequent interactions than many schools provide in their current mentoring programs. In speaking with some of the professional contacts who helped with this research, once-per-semester meetings were commonly the frequency provided to the students. Some schools may struggle with the desire for more frequent meetings because it requires more resources, particularly faculty and time, than many schools can feasibly provide. But for students, the idea of meeting once per month may be preferred because it is frequent enough to work toward goals, but not so frequent that it becomes stressful to “add one more thing to the calendar” when they already feel as if they are too busy. Students in the exploratory analysis indicated a desire for a mentor who would be “available to them”, and it would be interesting to further examine the meaning behind this type of statement. It would also be interesting to further explore this finding by examining what may cause the difference in desired frequency of contact. Perhaps the desired outcome of the relationship has influence on how often they want to meet, or even personality traits that may cause students to desire one frequency over the other. Furthermore, when taking into account the method of communication, it would be interesting to see if a combination of frequent virtual meetings paired with less-frequent face-to-face meetings is desirable.
Finally, examination of the desired outcome of the relationship yielded results indicating that students in this study prefer the relationship to be based on professional development when compared to personal development, but no statistically significant difference was seen between the two alternatives. Although these terms were not explicitly defined in the research, the qualitative exploration at the beginning of the study indicated that students viewed professional outcomes to be related to attainment of career goals while personal development related more to improvement of oneself as a professional in general. For students, the professional development outcome may be more desired because they feel less knowledgeable about the “next step” in the professional line and desire the knowledge and input of a mentor to help them navigate the decisions associated with their future goals. Again, an interesting viewpoint not evaluated in this research is the possibility that some students may desire mentoring relationships that focus a little on both professional and personal outcomes, while other students may truly only desire the professional advice and guidance to help them get to their next postgraduate step.

**IMPLICATIONS**

Mentorship in pharmacy education is an important concept and the provision of some form of this guidance and support is an expectation of all institutions as evidenced by its inclusion in the accreditation standards. This study is the first known attempt to not only quantify the perceived value of mentorship among student pharmacists but to also explore what students may prefer in a mentoring relationship. The instruments included in this study not only identify which specific functions mentors should provide for students but also the preferred structural aspects of mentorship programs.
Results from this study provide valuable information to administration in schools and colleges of pharmacy regarding what students want to see in mentoring relationships, starting with how they are formed and including even the day-to-day functions mentors can perform. This information can be used to create structured mentorship programs that include the aspects students find valuable and could potentially be more effective.

Given the minimal difference seen with regard to mentorship value among students with postgraduate education and training intentions and those without, support may be given to the idea that many mentorship strategies could be applied universally and may not be specific to only one or two postgraduate career plans. With this in mind, schools may find it valuable to develop a mentorship program that would be available to all students and incorporate similar mentoring functions in a setting that is most desired. Given the results of the DCE, it would be interesting to evaluate the desired structures and functions for individual institutions, develop a tailored program to meet these desires, and then examine the impact of this program following implementation.

The results of this study can also serve to improve mentoring development education by identifying and cultivating the aspects of the relationship students most value. By providing mentors with the preferences of the students, they may be able to better adapt their mentoring styles to fit the needs.

**FUTURE DIRECTIONS**

Several potential future research directions were identified through this project. Although this study was designed to measure value from the student perspective, future research could be done to examine mentorship from the perspective of the mentor. It would be interesting to
identify the level of value placed on mentoring from this viewpoint as well as explore the mentoring functions that mentors find most important in the relationship. It would also be interesting to compare what mentors thinks students want out of mentoring relationships with the results of this study which identify preferences for mentoring among students.

Another potential area of research involves further examination of the concept of peer mentorship and its potential utility in the pharmacy education environment. Currently, it is unclear how many institutions offer peer mentorship programs, either formal or informal. It would be interesting to quantify how many of these opportunities exist, whether or not students commonly take advantage of these opportunities, whether they value peer mentorship, and what they would like to see in these types of mentoring relationships in particular.

Because this study was the first to introduce the adapted Mentoring Functions Scale in pharmacy education, repeated use in this population is needed to establish reliability and validity of the instrument. Further research can also include further examination of the factor analysis for the measure, adaptation of the items, and subsequent use of the revised scale to allow for potentially better measurement of mentorship value in this population.

CONCLUSIONS

This study was the first to measure the value of mentorship among student pharmacists and has started to explore the preferences for mentoring relationships in this population. This study suggests that students place value not only on the career-oriented aspects of a mentoring relationship but also on the more psychosocial aspects. Students not only appear to value the task-based functions that directly impact their ability to obtain a future position, but they also value being able to respect their mentors and receiving respect in return. With regard to overall
value of mentorship in pharmacy education, this study supports the idea that students do find value in these relationships and future research can continue to explore the specific aspects and approaches most desired in the pharmacy education setting.
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LIST OF APPENDICES
APPENDIX A

INTERVIEW GUIDE
Purpose: To identify past experience with mentoring among student pharmacists as well as desire for a mentoring relationship based on future career plans and preferred mentoring functions.

Introductory questions
1. As of today, what are your immediate career plans after graduation?
   a. (prompt) If they say “I don’t know” provide options and ask them to identify which interests them most at that time.
2. Have those plans changed over time?
   a. If so, how many times? What else had you planned to do that now you are not?
3. What has influenced those plans?

General mentoring questions
1. How would you define the term “mentor”?
2. In your opinion, what characteristics make a good mentor?
3. Based on this definition, what do you feel like a mentor should “do”?

Past mentoring experience
1. Using the definition you provided earlier, have you ever had a mentor?
   a. If so, how did this relationship form?
   b. What did this mentor do for you?
   c. How long did the relationship last?
   d. Is this individual still your mentor?
2. Have you had multiple mentors?
   a. If so, what were their roles?

Mentoring preferences
1. What would you like a mentor to do for you?
2. What would you like a mentor to help you with?
3. What would you like a mentor to discuss with you?

Mentoring programs
Scenario: Most schools and colleges of pharmacy have formal mentorship programs in place. Feelings about these programs among students are mixed. Some find these assigned relationships to be valuable to their current and future experiences, while others find these assigned mentor programs to be less helpful.
1. What are your thoughts about mentoring programs at schools and colleges of pharmacy?
2. What value do you think they bring?
3. What are the aspects of the programs that may make them less helpful to students?
4. If you could create the ideal mentorship program, what would it look like?

Card Sorting Task: Mentoring relationship Attributes

Please place these cards in order of how important you find each attribute to be in your desired mentoring relationship. The first card should be the most important and the last card is the least important.
1. How the relationship is formed (ex. assigned vs. not assigned)
2. The number of people in the mentoring relationship (2 people, multiple mentors and one student, multiple students and one mentor)
3. The type of mentor in terms of role (peer, faculty member)
4. Method of communication (face-to-face, online, combination of both)
5. How long the relationship lasts (short term = 6-12 months and long-term 2-5 years)
6. Frequency of contact (daily, weekly, monthly, quarterly, as needed)
7. Outcomes of the mentoring relationship (career counseling/advancement, professional development, personal development)

Thank you for your participation. Before ending the interview, do you have any questions for me?
Each focus group started with a live Facebook video, welcoming the participants and explaining the study. Then prompts were posted individually, with 3-5 minutes in-between depending on the discussion taking place. At the end, a second live video was done thanking participants.

**Post 1**
Several great definitions of the term mentor were provided before this focus group. Here is a compilation of these definitions. Do you feel like anything is missing from this definition?
- If a new definition is created, use the new version for all subsequent questions

**Post 2**
What characteristics do you think a good mentor possesses?

**Post 3**
Discuss how important you feel mentorship is to your future career goals.

**Post 4**
With a mentoring relationship in pharmacy school, what is the main thing you are wanting to get out of the relationship? Career/counseling or advancement, professional development, personal development? (expand on what these mean)

**Post 5**
The next few posts will be about the structure of a mentoring relationship. When you think about this relationship, is how the relationship formed important to you?

**Post 6**
When it comes to communicating with your mentor, which method do you prefer? Face-to-face, online communication via email, online communication via FaceTime or Skype, or a combination of various methods? If combination, which are you okay with? Why?

**Post 7**
When you think about the length of a relationship with a mentor, do you prefer a longer relationship that spans over multiple years? Or do you prefer a shorter relationship that may only last for a few months but is formed for a specific task (ie, getting a residency)?

**Post 8**
In your preferred mentoring relationship, how often do you want to have contact with your mentor? Daily? Weekly? Monthly? Just as needed? Why?

**Post 9**
Per the theory I am using for my dissertation, mentorship can include two types of functions, or tasks, that a mentor can provide. Some functions are directly related to your career such as helping you understand options available to you and leading you through the pursuit of these options. Other functions are considered psychosocial and focus more on your general well-being and more personal aspects of a relationship. In your ideal mentoring relationship, are you seeking someone who only provides career functions, only provides psychosocial functions, or both?
APPENDIX C

SURVEY INSTRUMENT
Valuation of Mentorship in Pharmacy Education and the Impact of Perceived Personal Relevance

The purpose of this survey is to explore the value of mentorship among student pharmacists. The following survey should take approximately 20 minutes, the results will be kept confidential, and participation is voluntary. You may choose to end the survey at any time or skip any questions you do not want to answer. Your answers to these questions will not affect your grades in any class or your standing in the University of Mississippi School of Pharmacy.

This study has been reviewed by The University of Mississippi’s Institutional Review Board (IRB). If you have any questions, concerns, or reports regarding your rights as a participant research, please contact the IRB at (662) 915-7482 or irb@olemiss.edu.

I have read and understand the above information. By completing the survey/Interview I consent to participate in the study.

I attest that I am 18 years of age or older
Yes
No

Demographics
1. What is your current professional year in pharmacy school?
   - P1
   - P2
   - P3
   - P4

2. What is your age? ____________________________ years

3. With which gender do you identify?
   - Male
   - Female
   - Prefer not to say
4. What is your ethnicity?
   - White/Caucasian
   - Black/African American
   - Hispanic/Latino
   - Native American/American Indian
   - Asian/Pacific Islander
   - Other (please specify) ________________________________________________

5. What is your current postgraduate path?
   - Community pharmacy
   - Hospital pharmacy (no residency)
   - Residency training
   - Graduate school
   - Fellowship training
   - Other (please specify) ________________________________________________

**Perceptions of Mentorship**
Mentorship can be defined as "the provision of guidance, support, and advice in order to enhance both the personal and the professional development of a mentee. In this relationship, the mentor often provides support based on personal experience, but encourages the mentee to create goals based on personal interests and aids in the achievement of these goals.

7. Using this definition of mentorship, has there been someone in your life, either current or in the past, that has fulfilled this role for you?
   - Yes
   - No
   - I'm not sure

8. Do you agree with this definition of mentorship? Discuss why or why not.
   ________________________________
   ________________________________
   ________________________________
9. What form of mentorship program does your school have?
   - Formal program with assigned faculty mentors
   - Formal peer mentorship program
   - Informal program with no assigned mentors
   - Other (please specify)
   - No program exists at my school
   - I'm not sure

10. On a scale of 1 to 10, how important do you find mentorship?

<table>
<thead>
<tr>
<th>Mentorship Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not important at all</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
</tbody>
</table>

11. On a scale of 1 to 10, how likely are you to participate in a mentoring relationship at this time?

<table>
<thead>
<tr>
<th>Likelihood to participate in a mentoring relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all likely</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
</tr>
</tbody>
</table>
Preference for Mentorship Program Structure

12. Of the two mentorship program structures listed below, which do you prefer?

Structure 1
- Mentor assigned to you
- Talk about professional development
- Meet once per semester
- Virtual meetings

Structure 2
- Mentor chosen by me
- In-person meetings
- Meet once per week
- Talk about professional development

13. Of the two mentorship program structures listed below, which do you prefer?

Structure 1
- Short-term relationship (6-12 months)
- Mentor chosen by me
- Talk about professional development
- Meet once per semester

Structure 2
- Long-term relationship (2-5 years)
- Mentor chosen by me
- Talk about personal development
- Meet once per month

14. Of the two mentorship program structures listed below, which do you prefer?

Structure 1
- Short-term relationship (6-12 months)
- Mentor assigned to me
- Virtual meetings
- Meet once per week
- Talk about personal development

Structure 2
- Long-term relationship (2-5 years)
- Mentor chosen by me
- In-person meetings
- Meet once per month
- Talk about professional development
15. Of the two mentorship program structures listed below, which do you prefer?

**Structure 1**
- Long-term relationship (2-5 years)
- Mentor chosen by me
- Virtual meetings
- Meet once per week
- Talk about personal development

**Structure 2**
- Short-term relationship (6-12 months)
- Mentor assigned to me
- Virtual meetings
- Meet once per month
- Talk about professional development

16. Of the two mentorship program structures listed below, which do you prefer?

**Structure 1**
- Short-term relationship (6-12 months)
- Mentor assigned to me
- Virtual meetings
- Meet once per month
- Talk about professional development

**Structure 2**
- Long-term relationship (2-5 years)
- Mentor assigned to me
- In-person meetings
- Meet once per semester
- Talk about personal development

17. Of the two mentorship program structures listed below, which do you prefer?

**Structure 1**
- Long-term relationship (2-5 years)
- Mentor assigned to me
- In-person meetings
- Meet once per week
- Talk about professional development

**Structure 2**
- Short-term relationship (6-12 months)
- Mentor chosen by me
- Virtual meetings
- Meet once per semester
- Talk about professional development
18. Of the two mentorship program structures listed below, which do you prefer?

Structure 1
- Long-term relationship (2-5 years)
- Mentor assigned to me
- In-person meetings
- Meet once per week
- Talk about personal development

Structure 2
- Long-term relationship (2-5 years)
- Mentor chosen by me
- Virtual meetings
- Meet once per month
- Talk about professional development

19. Of the two mentorship program structures listed below, which do you prefer?

Structure 1
- Long-term relationship (2-5 years)
- Mentor assigned to me
- In-person meetings
- Meet once per semester
- Talk about personal development

Structure 2
- Short-term relationship (6-12 months)
- Mentor chosen by me
- In-person meetings
- Meet once per week
- Talk about professional development

20. Of the two mentorship program structures listed below, which do you prefer?

Structure 1
- Short-term relationship (6-12 months)
- Mentor chosen by me
- In-person meetings
- Meet once per semester
- Talk about personal development

Structure 2
- Long-term relationship (2-5 years)
- Mentor assigned to me
- In-person meetings
- Meet once per week
- Talk about professional development
21. Of the two mentorship program structures listed below, which do you prefer?

Structure 1

- Long-term relationship (2-5 years)
- Mentor chosen by me
- Virtual meetings
- Meet once per week
- Talk about personal development

Structure 2

- Short-term relationship (6-12 months)
- Mentor assigned to me
- In-person meetings
- Meet once per month
- Talk about personal development

22. Of the two mentorship program structures listed below, which do you prefer?

Structure 1

- Short-term relationship (6-12 months)
- Mentor chosen by me
- In-person meetings
- Meet once per semester
- Talk about personal development

Structure 2

- Short-term relationship (6-12 months)
- Mentor assigned to me
- Virtual meetings
- Meet once per month
- Talk about professional development

23. Of the two mentorship program structures listed below, which do you prefer?

Structure 1

- Short-term relationship (6-12 months)
- Mentor assigned to me
- In-person meetings
- Meet once per month
- Talk about personal development

Structure 2

- Long-term relationship (2-5 years)
- Mentor assigned to me
- Virtual meetings
- Meet once per semester
- Talk about professional development
Revised Personal Involvement Inventory

24. To me, a relationship with a mentor is:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>boring</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>relevant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>exciting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>means nothing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>appealing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>fascinating</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>worthless</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>involving</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>not needed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

unimportant
interesting
irrelevant
unexciting
means a lot to me
unappealing
mundane
valuable
uninvolving
needed
Mentoring Functions Scale
25. Below is a list of "functions" that can be performed by a mentor in the context of a mentoring relationship. Please indicate how important it is for your mentor to perform each of these functions.

1= not very important and 10=extremely important

<table>
<thead>
<tr>
<th>Function</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shares his/her career with me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Encourages me to prepare for my postgraduate career</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Suggests specific strategies for achieving my career goals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Shares ideas with me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Suggests specific strategies for accomplishing my professional objectives</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Gives me feedback regarding my performance as a student pharmacist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Encourages me to try new ways of utilizing my role as a student and opportunities presented to me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Conveys feelings of respect for me as an individual</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Asks me for suggestions concerning problems I have encountered at school</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Demonstrates good listening skills in our conversations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Discusses my questions or concerns regarding feelings of competence, commitment to advancement, relationships with peers and faculty members or work/family conflicts</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Shares personal experiences as an alternative perspective to my problems</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Encourages me to talk openly about anxiety and fears that detract from my work</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Conveys empathy for the concerns and feelings I discuss with him/her</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Keeps feelings and doubts I share with him/her in strict confidence</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Reduces unnecessary risks that could threaten the possibility of my becoming a pharmacist</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Encourages me to finish assignments/tasks or meet deadlines that otherwise would have been difficult to complete</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Helps me meet new colleagues</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>
Advises me through activities that increase written and personal contact with individuals who may be influential in my future career  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

Provides me with opportunities such as lab work, writing and presenting, internships, etc. that have increased my contact with people in pharmacy who may judge my potential for future advancement  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

Suggests or encourages me to engage in tasks in my work that prepare me for a job or a residency  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

Suggests or encourages me to engage in tasks that present opportunities to learn new skills  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

Provides me with support and feedback regarding my performance as a student  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

Engages with me in informal exchanges/fellowship beyond the mentoring relationship  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

Shares mutual interests, experiences, etc. outside the mentoring relationship  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

26. In the context of a mentoring relationship, how important do you find the following factors?  

1= not very important and 10= extremely important  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

Wanting to imitate the work behavior of my mentor  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

Agreeing with my mentor’s attitudes and values regarding pharmacy careers  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

Being able to respect and admire my mentor  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

Striving to want to be like my mentor when I reach a similar position in my career  

<table>
<thead>
<tr>
<th>Importance</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>
27. If your preferred mentoring relationship were available to you, how likely would you be to participate?

<table>
<thead>
<tr>
<th>Likelihood to participate in a mentoring relationship</th>
<th>Not at all likely</th>
<th>Extremely likely</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>

28. On a scale of 1 to 10, how important do you find mentorship after completing this survey?

<table>
<thead>
<tr>
<th>Mentorship Importance</th>
<th>Not important at all</th>
<th>Extremely important</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>

Thank you so much for your willingness to complete this important survey! Please follow this link to a separate survey to provide your contact information. This will enter you into a drawing for one of TWO $100 Visa gift cards. Your answers on the previous survey will not be linked to your contact information.

http://uofmississippi.qualtrics.com/jfe/form/SV_4SDvOIXEVd8rfKd
VITA

ASHLEY STUBBLEFIELD CRUMBY, PHARMD, MS

CURRENT POSITIONS

Doctoral Student
Department of Pharmacy Administration
University of Mississippi School of Pharmacy
University, Mississippi
August 2013 – present

Adjunct Clinical Assistant Professor of Pharmacy Practice
Purdue University College of Pharmacy
West Lafayette, Indiana
August 2013 – present

PROFESSIONAL EDUCATION AND TRAINING

Masters in Pharmaceutical Sciences with an emphasis in Pharmacy Administration
University of Mississippi School of Pharmacy
University, Mississippi
Degree conferred May 2017
2013 – 2017

PGY2 Pediatric Infectious Disease Residency
Arkansas Children’s Hospital
University of Arkansas for Medical Sciences
Little Rock, Arkansas
Director & Primary Preceptor: Holly D. Maples, PharmD
Certificate awarded June 2011
2010 – 2011

PGY1 Pediatric Pharmacy Practice Residency
Arkansas Children’s Hospital
University of Arkansas for Medical Sciences
Little Rock, Arkansas
Director: Holly D. Maples, PharmD
Certificate awarded June 2010
2009 - 2010
PROFESSIONAL EDUCATION AND TRAINING (CONTINUED)

Doctor of Pharmacy 2007 – 2009
University of Mississippi School of Pharmacy
University, Mississippi
Degree Conferred: May 2009

Bachelor of Science in Pharmaceutical Sciences with a Dual Track in Pharmaceutical Marketing and Management 2003 – 2007
University, Mississippi
Cum Laude
Degree Conferred: May 2007

PROFESSIONAL EXPERIENCE

Pharmacist (PRN) March 2015 – September 2015
Baptist Memorial Health – North Mississippi
Oxford, Mississippi

Graduate Student Assistant June 2014 – March 2017
Research Integrity and Compliance
University of Mississippi Institutional Review Board
University, Mississippi

Clinical Pharmacist, Pediatric Antimicrobial Stewardship November 2012 – July 2013
Riley Hospital for Children at Indiana University Health
Indianapolis, Indiana

Clinical Assistant Professor of Pharmacy Practice September 2011 – July 2013
Purdue University College of Pharmacy
West Lafayette, Indiana

Clinical Pharmacist, Pediatric Infectious Disease & HIV September 2011 – July 2013
Riley Hospital for Children at Indiana University Health
Ryan White Center for Pediatric Infectious Disease
Indianapolis, Indiana

Clinical Assistant Professor of Medicine September 2011 – July 2013
Indiana University School of Medicine, Department of Medicine
Indianapolis, Indiana

Instructor, University of Arkansas for Medical Sciences August 2009 – July 2011
College of Pharmacy
Little Rock, Arkansas
AWARDS AND RECOGNITION

University of Mississippi Graduate Student Achievement Award 2019
American Foundation of Pharmaceutical Education
Pre-Doctoral Fellow in Pharmaceutical Sciences 2018
University of Mississippi School of Pharmacy PY1 Teaching Assistant of the Year 2016, 2015
Purdue University College of Pharmacy Preceptor of the Year 2013
Spirit of PPAG Award 2013
American Pharmacists Association Distinguished New Practitioner Award 2013
Purdue University Teaching for Tomorrow Fellowship Award 2012

CERTIFICATES AND LICENSES

Mississippi Board of Pharmacy License #P13654 2014 – present
American Academy of HIV Medicine Credentialed HIV Pharmacist 2012 - 2016
Indiana Board of Pharmacy License # 26024130A 2011 – 2013
Arkansas Board of Pharmacy License #PD11104 2009 – present
Collaborative Institutional Training Initiative (CITI) Program 2009 – present
Human Research Training
Postgraduate Teaching Certificate Program 2009 – 2011
University of Arkansas for Medical Sciences College of Pharmacy
HIPAA Compliance Training 2007 – present