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U.S. ARMY PHYSICIAN ASSISTANT RETENTION: A CROSS-SECTIONAL SURVEY
USING LATENT CLASS ANALYSIS

by

ROBERT GREENER

A DISSERTATION

Presented to the Faculty of the University of the Incarnate Word
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF THE INCARNATE WORD

December 2022

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Robert Greener

DEDICATION

This work is dedicated to my wife who has stood by me and supported me despite the challenges. I deeply appreciate your patience and the sacrifices you have made to make this dissertation possible. You have been a sounding board and have put so much effort into enabling me to complete this goal. I am incredibly lucky to have had your support throughout these years. This dissertation is only the starting point, and I take comfort knowing I can rely on you to help us through the challenges that come next. To my son Josh, your academic prowess has challenged me to complete this dissertation before you complete your own. Look forward to seeing yours soon. Finally, to my daughter Mia, who has such an infectious smile and boundless energy, I hope to keep the lessons in this dissertation and my future discoveries in my mind to continue to help you chart your own path in this world.

U.S. ARMY PHYSICIAN ASSISTANT RETENTION: A CROSS-SECTIONAL SURVEY USING LATENT CLASS ANALYSIS

Robert Greener, PhD

University of the Incarnate Word, 2022

Introduction: Retaining employees is crucial to the success of organizations. While significant effort has been made to model employee retention, models have been unable to significantly predict retention. The purpose of this quantitative, non-experimental, cross-sectional study was to develop an improved employee retention model which could be used as a practical guide to improve employee retention. **Materials and Methods:** The study analyzed a survey created, implemented, and collected by the Statistical Cell at the U.S. Army Center of Excellence. In September of 2020, all 864 active-duty PAs were sent a link to the survey and 290 completed the survey, for a participation rate of 33.6%. The study used a combination of population-based regression analysis and subgroup-based latent class analysis. To guide the study a conceptual model combined a population-based retention model (Causal Model of Turnover) with a subgroup-based person-centered model (Proximal Withdrawal State Theory). IRB approval was obtained thru the U.S. Army Medical Center of Excellence and University of the Incarnate Word. **Results:** Multivariate logistical regression found belief career goals were achievable in Army medicine (adjusted odds ratio 0.74, 95% CI 0.57, 0.98), age (adjusted odds ratio 0.63, 95% CI 0.41, 0.98), and perception DHA control of Army medicine affects retention (adjusted odds ratio 0.54, 95% CI 0.39, 0.75) as factors able to predict the intent to serve 20 years in the Army. Latent Class Analysis (LCA) divided the population into three groups, the sensitive stayers, moderates, and indifferent leavers. The sensitive stayers had the highest retention (0.93) and

were most likely to be concerned about variables affecting retention. The indifferent leavers had the lowest retention (0.68) and the least concern for variables affecting retention. The moderates fell in between the other two groups. Belief career goals were achievable in Army Medicine was the only variable able to predict class memberships in the three classes of LCA ($p < 0.001$). A revised conceptual model was improved by adding perception career goals were achievable in the organization to better unify the model. **Conclusions:** The extent goals are perceived to be achievable in the current job create job satisfaction and organizational commitment which strengthens intent to stay. Career goals vary based on the individual and accounting for these individual preferences provides a bridge to cohesively unite population-based retention models with person centered retention models. Strengths of this study include the incorporation of two leading retention theories into one cohesive model improved by the study using results triangulated with multiple statistical techniques and past criticisms of retention theories. Weaknesses include the use of secondary cross-sectional data not designed to support the conceptual framework and the population was limited to only U.S. Army PAs. Future studies should utilize experimental longitudinal studies to consider how the perception of career goals being achievable in an organization can be improved to increase retention.

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Chapter 1: Introduction to the Study

Advances in U.S. military healthcare have led to survival rates for casualties of recent conflicts who arrive to U.S. combat hospitals to be as high as 98% (Mabry & DeLorenzo, 2014). Tragically, 87% of recent U.S. military mortality has occurred pre-hospital, and 25% of all U.S. military mortalities were potentially survivable (Eastridge et al., 2009; Kelly et al., 2008). U.S. Army Physician Assistants (PAs) are most often the medical officers responsible for medical care of U.S. Army casualties from point of injury until the casualties arrive at combat hospitals (Salyer, 2002), often without physician oversight prior to a casualty arriving to combat hospitals (Soliz, 2012). As the bulk of U.S. military preventable deaths are pre-hospital, and most U.S. Army pre-hospital medical providers are PAs, military PAs play a pivotal role in preventing American military casualties. Consequently, the U.S. Army needs to recruit and retain highly skilled and experienced PAs for frontline medical care, care which cannot be outsourced to civilians due to dangerous and austere military environments (Marble, 2015; Richter & Hanhart, 2012).

The U.S. Army recruits around six civilian PAs each year into the active-duty Army (M. Thomas, personal communication, June 19, 2020). Most active-duty U.S. Army PAs are Army graduates of the Interservice Physician Assistant Program (IPAP) (B. Burk, personal communication, March 14, 2020). IPAP only accepts applicants from the military, averaging 195 eligible applicants annually in recent years and creating around 100 new U.S. Army IPAP students each year (E. Driver, personal communication, July 14, 2020). Of those selected for IPAP, not all are able to graduate the challenging 27-month program, which has averaged an 81% graduation rate in the last few years (L. Lindsay, personal communication, November 24, 2021).

While IPAP trains students to perform as PAs at standards set by the Accreditation Standards for Physician Assistant Education, it does not focus on preparation of the student to serve in the unique role of austere military medicine (Luke, 2021). This training mostly occurs after graduation, through mentorship by experienced military healthcare providers (active-duty PAs), additional post-graduate specialized training programs, military field training, and deployments. Each year, many PAs leave the Army, while there exists only a limited qualified application pool from which to create replacements. The substantial time and governmental financial investment are lost when they leave the military. Retention of experienced PAs creates trained and experienced PAs, able to adapt to constantly changing battle conditions, and to provide high quality healthcare at or close to the point of injury (B. Burk, personal communication, March 14, 2020).

U.S. Army Physician Assistant Retention

Due to new missions requiring U.S. Army active-duty PAs, the number authorized for them have recently increased from 850 to 933 (D. Hamilton, personal communication, February 9, 2022). Unfortunately, U.S. Army active-duty PAs are only at 66% strength at the ranks of Captains and below and approximately 50% strength for specialty Orthopedics and Emergency Medicine specialties (D. Hamilton, personal communication, February 9, 2022). As a result, recruitment and retention are one of the three top priorities of the U.S. Army active-duty PA consultant (D. Hamilton, personal communication, February 9, 2022). To improve recruitment and retention, the committee on PA Recruitment and Retention (one of four U.S. Army PA strategic committees) has goals that include junior officer outreach and mentorship, PA recognition, career/talent management, bonuses, and other recruitment/retention tools (B.A. Soliz & J. Jones, personal communication, October 26, 2021). Additionally, to better understand

retention, a recent initiative asked senior PAs to conduct exit interviews of all active-duty PAs leaving the service, using a standardized list of questions (B.A. Soliz & J. Jones, personal communication, October 26, 2021).

There have been many studies on military retention, with each study tending to arrive at different retention strategies. In a U.S. Army officer retention study, Coates et al. (2011) looked at the effectiveness of a U.S. Army retention incentive program that offered money, choice of military base assignment, or additional training in exchange for a contract for additional military service. The highest acceptor of the retention bonus was nurses at 99%, and the second was aviation at 50%. The Specialist Corps (the Corps belonging to U.S. Army Physical and Occupational Therapists, Dietitians, and PAs) was the sole low outlier, at only 23% acceptance of these retention incentives. This study recommended further research into Specialist Corps retention. The largest profession within the Specialist Corps is PAs.

Retention challenges for U.S. Army PAs are like those for other military medical officers, although with many significant differences. Most U.S. Army medical professionals work within the U.S. Army Medical Command (MEDCOM), based primarily in military clinics and hospitals. However, U.S. Army PAs most often work in combative units within U.S. Army Forces Command (FORSCOM) and practice austere medicine in far-forward locations, away from the bulk of other U.S. Army medical assets. Practicing austere medicine leads to challenges and experiences different from much of the rest of U.S. Army medical professionals. Also, unlike most other medical officers, military PAs have all served in the military in another military specialty prior to becoming PAs. Therefore, they have more military experience than most new medical officers, but they are often closer to being eligible for military retirement when they

begin their new profession as PAs. The austere medical environment and their previous military experiences are among the reasons PA retention challenges are unique.

In an article on U.S. Army PA retention, Major Bill Soliz (2012) focused only on limited promotion opportunities. Prior to 1992, U.S. Army PAs were warrant officers (a type of officer who provides technical expertise) and transitioned to commissioned officers in 1992 (Colver et al., 2007; Soliz, 2012). Many PAs then lacked advanced education, and few transitioned into higher ranking positions (Soliz, 2012). Around this time, a considerable number of active-duty PAs retired before being promoted into higher ranks. Not filling many of the higher ranks authorized for them by Congress, many of these authorizations for promotion into advanced ranks for PAs were given to other medical specialties who could fill these positions with their own officers (Soliz, 2012).

After this loss of higher-ranking authorizations for PAs, active-duty PAs had slim chances for promotion which lowered retention rates (Soliz, 2012). While limited promotions have historically been a retention challenge for U.S. Army PAs, 2021 brought improved promotion rates. Promotion rates to Major for active-duty PAs increased from 35% to 74%, which are promotion rates similar to the rest of the U.S. Army (Department of the Army, U.S. Army Human Resources Command, 2021). While Soliz's (2012) issue was valid at the time, retention is an ever-evolving multifactorial problem, with everyone involved having different perspectives. Therefore, retention analysis requires a comprehensive and timely approach to looking at many different perspectives (Richter & Hanhart, 2012). No studies have looked at military PA retention in the other branches (Navy, Air Force, or Coast Guard) or in the Reserves or National Guard of any branch.

Statement of the Problem

Turnover in professions with workforce shortages, such as in healthcare, reduces the ability of employers to replace employees (Meier & Hicklin, 2008). To understand turnover, military retention studies generally use population-based regression analysis to uncover the variables linked to the intent to stay or leave (Chaffin et al., 2008). However, many retention studies have demonstrated that the decision to stay (or leave) is complex, and retention studies have been unable to significantly predict retention (Garver et al., 2008; Meyer & Herscovitch, 2001; Price, 2001). This has led later studies to move away from prediction and instead seek to understand the path that individuals take during the process of making retention decisions (Holt et al., 2007; Hom et al., 2012; Maertz & Campion, 2004).

Because of the impact that U.S. Army PAs have on the survivability of soldiers, and the difficulty in replacing U.S. Army PAs, U.S. Army PA retention is vital. The decision to stay in the military is complex, and retention efforts require multifactorial approaches (MacManus & Strunz, 1993; Richter & Hanhart, 2012). Working conditions influence PAs differently than physicians, dentists, or medics, due to differences in their motivations, job prospects, and military job requirements (Colver et al., 2007; Soliz, 2012). Studies on different military professions arrive at different conclusions (Booth-Kewley et al., 2017; Chaffin et al., 2008; Pehrson & Hamlin, 2002; Wojcik et al., 2020), demonstrating the limited transferability of results from one group to another. While no studies have investigated the many complex reasons why PAs remain in the military, research has shown the need to explore the unique retention needs of U.S. Army PAs (Coates et al., 2011). Studies have also not looked at the effectiveness of active-duty U.S. Army PA retention interventions that change over time and include specialized training programs and retention bonuses.

The intent to stay for at least 20 years was chosen as the benchmark for successful retention, as the retirement pension at 20 years is the incentive the Department of Defense uses to encourage retention to 20 years, and to encourage servicemembers to leave after 20 years (Department of Defense, 2008). Officers may separate voluntarily or involuntarily, from releases, retirement, resignation, discharge, discharge to Reserves, or for unspecified reasons (Hattiangadi et al., 2005). Releases are when an officer does not accept their offered career specialty and are rarely relevant to U.S. Army PAs, due to the requirement that they sign a contract to serve as U.S. Army PAs after they graduate to attend the IPAP. Captains who fail to promote to Major twice are often separated at between 10 and 15 years of service (Glaser, 2011). PAs with significant prior-service enlisted time may be able to reach 20 years of service before reaching Major or may be selectively allowed to continue to 20 years. Majors who twice fail promotion to Lieutenant Colonel are involuntarily retired after 20 years (Glaser, 2011). Discharges may be a result of injury or disability, or governmental downsizing (Glaser, 2011). Unspecified reasons are often military legal violations (Glaser, 2011).

The highest voluntary separation rates among all military officers are resignations after their first initial commitment period (Glaser, 2011). For most military PA graduates of IPAP, this would be after they complete their 54-month military commitment incurred after graduating from IPAP (U.S. Army Recruiting Command, n.d.). The completion of the initial commitment period is also generally the first opportunity for them to separate and utilize their skills as civilian PAs. Officers who begin their careers in enlisted ranks often have shorter careers as officers due to hitting 20 years of total service earlier than those without previous enlisted time (Glaser, 2011).

U.S. active-duty soldiers are immediately eligible for retirement reimbursement rather than having minimum ages, like other NATO countries (Turner & Klein, 2016). This increases

the costs of military pensions and provides an incredible incentive for retirement immediately after 20 years of service (Turner & Klein, 2016). The traditional retirement system provides a monthly benefit based on a percentage of their base pay for every year of service immediately after an active-duty retirement (Asch et al., 2015). Deferring a significant amount of compensation until retirement provides a predictable personal management incentive (Asch et al., 2015), which supports a pyramid shaped rank structure with larger amounts of lower ranking individuals (Hinote & Sundvall, 2015). However, being immediately eligible for retirement pay at 20 years of service has been criticized for encouraging careers to be shorter than ideal when the learning curve of the job is long, the value of experience high, and physical demands not as important (Asch et al., 2015).

The newer blended retirement system lessens the retirement pay percentage from 2.5% to 2.0% of their base pay per year of service and provides increased flexibility in career lengths by providing a matching 401k incentive (Asch et al. 2015). Under the traditional system those who leave prior to 20 years receive no retirement benefit, although under the blended system they retain their 401k funds. Providing an incentive to stay longer than 20 years is particularly important for U.S. Army PA retention, given the long learning curve and the shorter amount of time being a PA before reaching 20 years of service, compared to other military officers, and given their previous military experience prior to being a PA.

U.S. Army PA retention is a complex phenomenon, with many interacting factors requiring a sophisticated analysis when exploring the problem. Retention bonuses, specialized training programs, and other measures to address retention needs are slow moving, requiring involvement of several parties throughout the U.S. Congress, Department of Defense, Department of the Army, and Army Medical Command (Coates et al., 2011). Understanding the

unique retention needs of U.S. Army PAs allows for recommendations that are clear, timely, and accurate to prevent costly mistakes utilizing suboptimal and/or incomplete retention strategies.

Purpose of the Study

The purpose of this quantitative, non-experimental, cross-sectional study was to provide recommendations for improving U.S. Army active-duty PA retention while improving theoretical employee retention understanding. The goal for retention was defined as the intent of U.S. Army active-duty PAs to stay for at least 20 years. The intent to stay at least 20 years is supported by the Tenth Quadrennial Review of Military Compensation (Department of Defense, 2008), which states that the purpose of military retirement is to provide a personnel shaping tool that offers an incentive for members to stay until 20 years of service, and an incentive to leave thereafter.

While intent to stay does not always predict turnover, it has been a strong predictor (Hoyos & Serna, 2021; Søbstad et al., 2021). This study used a twofold approach to analyze a recent online survey given to all active-duty U.S. Army PAs. First, the study utilized traditional population-based regression analysis to identify the variables linked to retention decisions. Second, Latent Class Analysis (LCA) uncovered subgroups based on their retention characteristics and compared the variations in each subgroup. Finally, the variables linked to retention decisions were evaluated to see if they could predict the subgroups. The twofold approach compared the traditional methods to more recent methods to provide a more complete picture so that leaders could make informed decisions on improving U.S. Army PA retention.

Theoretical Framework

To understand the research questions, two theories that primarily shape this study must be examined. The first is Price's (2001) Causal Model of Turnover, which provides the relationships between the variables associated with retention decisions. While several other

variable-based retention models were considered to form the theoretical framework, the causal model was favored as being more comprehensive, as it incorporated variables from many of the less comprehensive alternatives.

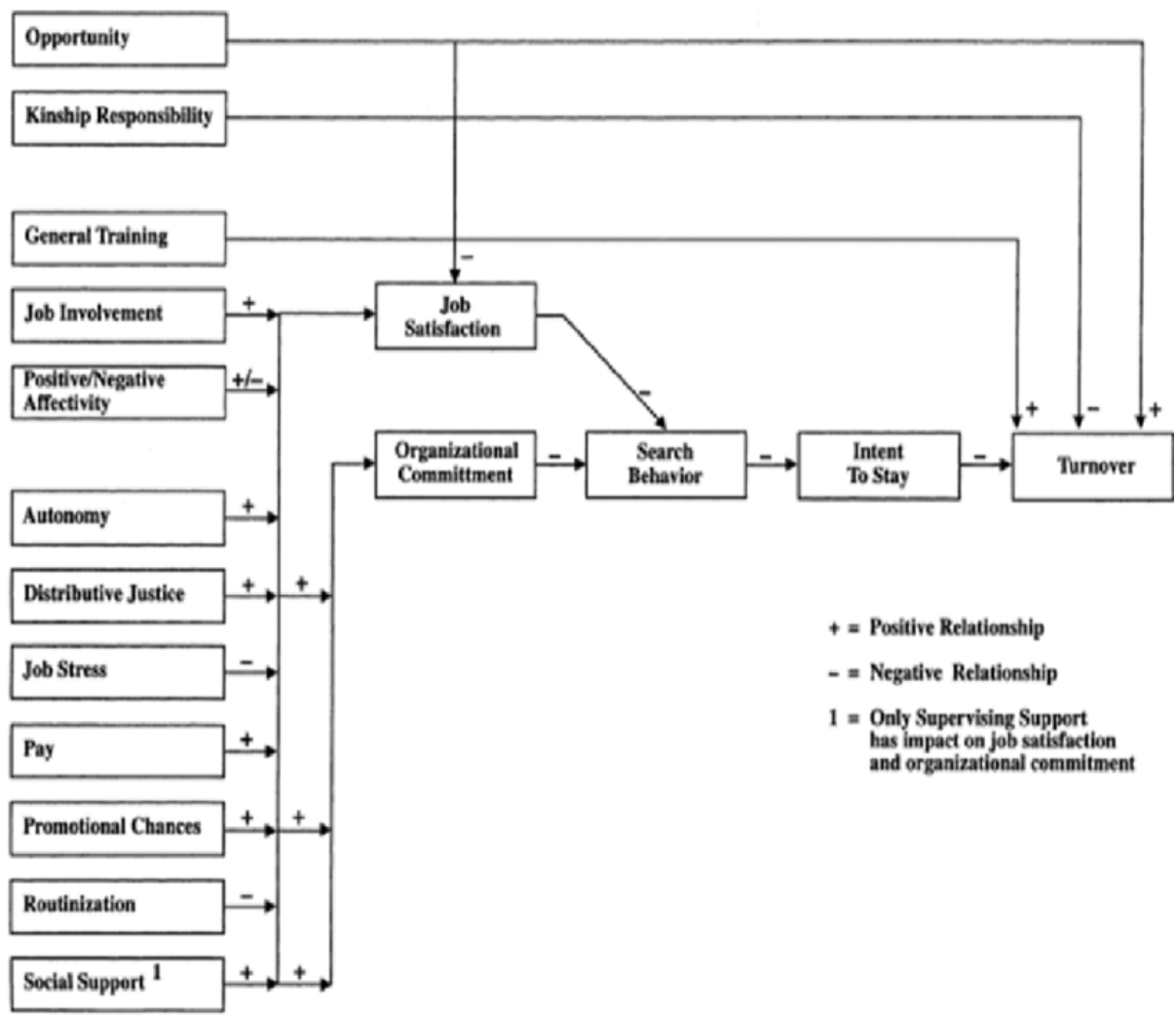
As examples for alternative theories to the causal model, the self-determination theory looks at the need for autonomy, competence, and relatedness (Deci & Ryan, 1985). These needs are part of the causal model as autonomy, job involvement, and social support (Price, 2001). The Job Demands-Job Resources model considers the role of support from management, colleagues, family, and friends to overcome workload (Giauque et al., 2013). These variables are job stress and social support in the causal model (Price, 2001). The Herzberg's two-factor theory of motivation separates motivators (satisfiers), which create job satisfaction, from hygiene factors (dissatisfactors), which create job dissatisfaction (Herzberg, 1966). The process of creating job satisfaction is different than the process of job dissatisfaction in this theory. However, there is controversy over which variables fit either group (Alrawahi et al., 2020), which is what favored the use of the causal model in this study. While Figure 1 depicts the intent to stay, the intent to leave replaced it in later versions (Kieckbusch et al., 2003), despite the motives behind leaving and staying being different (Cho et al., 2009). See the Causal Model of Turnover in Figure 1.

The second theory forming the conceptual framework is the Proximal Withdrawal States Theory (PWST), which divides people into subgroups based on their intent to stay ("yes" or "no"), and their Perceived Volitional Control (PVC) over their ability to stay ("yes" or "no") (Han et al., 2019). Hom et al. (2012) states that PWST seeks to understand individuals immediately before their intent to quit, while previous research was more broadly focused on variables prior to this event that affect the intent to stay, such as characteristics of the job.

PWST was added to the conceptual model as perhaps the most integrative person-centered theory to date bringing together two major person-centered theories (Maertz, 2012). The first is the job embeddedness theory, a content model, which explains the why of quitting (Maertz, 2012; Shibiti, 2019). The second is the unfolding model, a process model, which explains the how of quitting (Maertz, 2012; Maertz & Campion, 2004). As a unified model, PWST better explains the retention process than its predecessors (Maertz, 2012).

Figure 1

Causal Model of Turnover



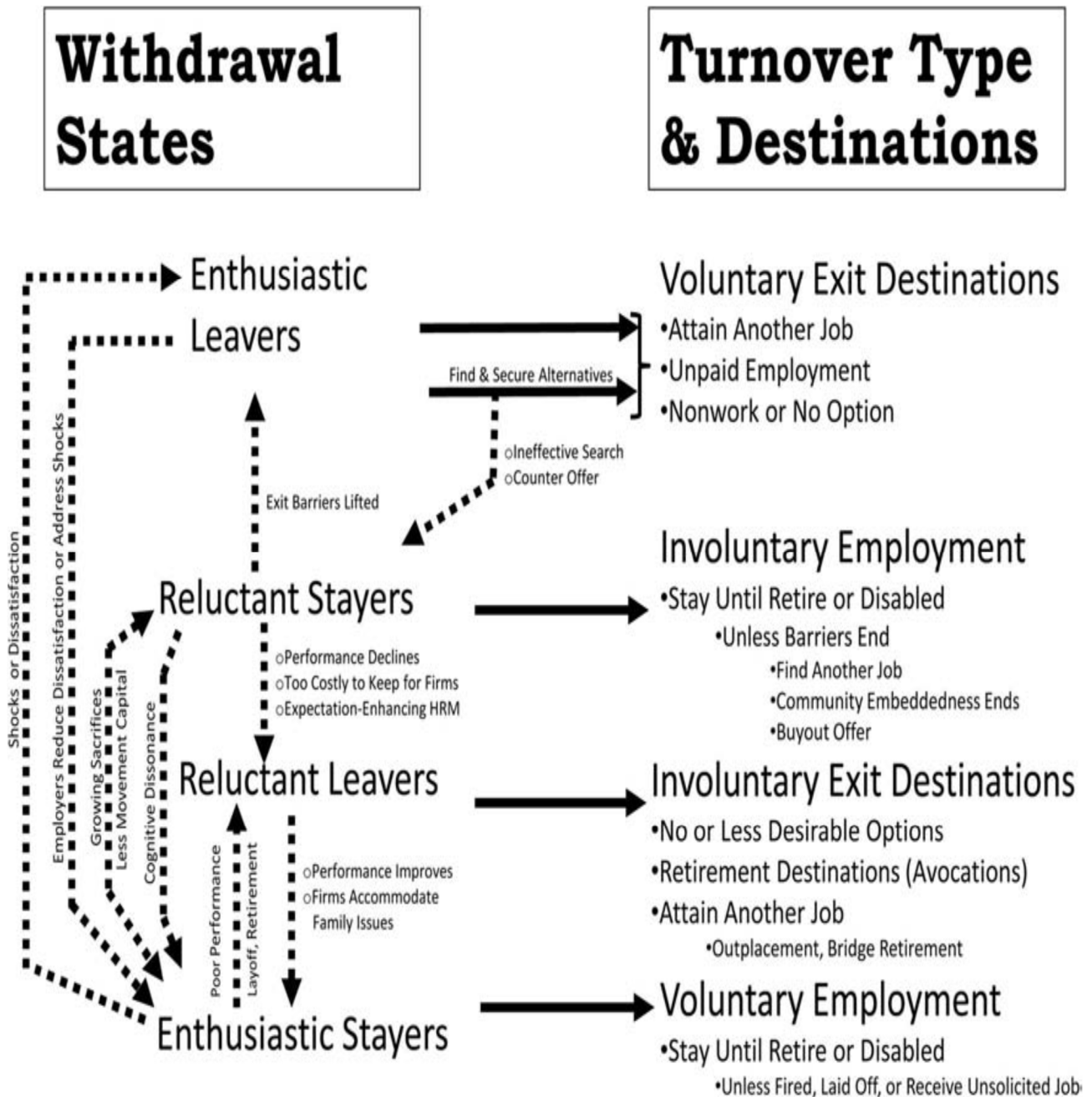
Note. Reproduced with permission from Price (2001). See Appendix G for copyright permission.

The PWST supports the need to segment retention populations into subgroups based on their retention mindsets and consider each subgroup separately during analysis (Li et al., 2016). The needs of the subgroups are important to retention, needs which may be masked by population only analysis (Hom et al., 2012). The model explains how employees move into different subgroups so leaders can make targeted interventions to improve retention (Hom et al., 2012). See the PWST in Figure 2.

Conceptual Framework

Evaluating the strength of retention variables in a population is still commonly used in retention studies (Booth-Kewley et al., 2017; Chaffin et al., 2008; Pehrson & Hamlin, 2002; Wojcik et al., 2020). However, recent retention studies have also segmented individuals into groups associated with retention (Han et al, 2019). The conceptual framework used for this study blended the two leading theories discussed in the theoretical framework. The Causal Model of Turnover (Price, 2001) identifies the primary variables that influence the secondary variables of job satisfaction, organizational commitment, and search behavior, which influence intent to stay. The variable Positive/Negative Affectivity was removed from the conceptual framework due to bias with other measurements (Hom & Griffeth, 1995).

PWST takes intent to stay, also included in the Causal Model of Turnover (Price, 2001), and compares it to PVC (perceived control over ability to make the retention decision). The combination of “yes” or “no” to these two binary questions creates the four categories of PWST. By adding PVC into the causal model, this conceptual model was then able to add the subgroups of “Enthusiastic Leavers,” “Reluctant Stayers,” “Reluctant Leavers,” and “Enthusiastic Stayers” from PWST. Each subgroup is formed by the intent to stay and PVC over their retention decision.

Figure 2*Proximal Withdrawal State Theory (PWST)*

Note. Reproduced with permission from Hom et al. (2012). See Appendix H for copyright permission.

Figure 3 illustrates the combination of these two theories, which is the conceptual framework created for this study. The left side of Figure 3, up to and including intent to stay, is Price's (2001) Causal Model of Turnover. PVC from PWST has been added, and the combination of PVC and intent to stay create the four subgroups of PWST. See Figure 3 for the conceptual framework.

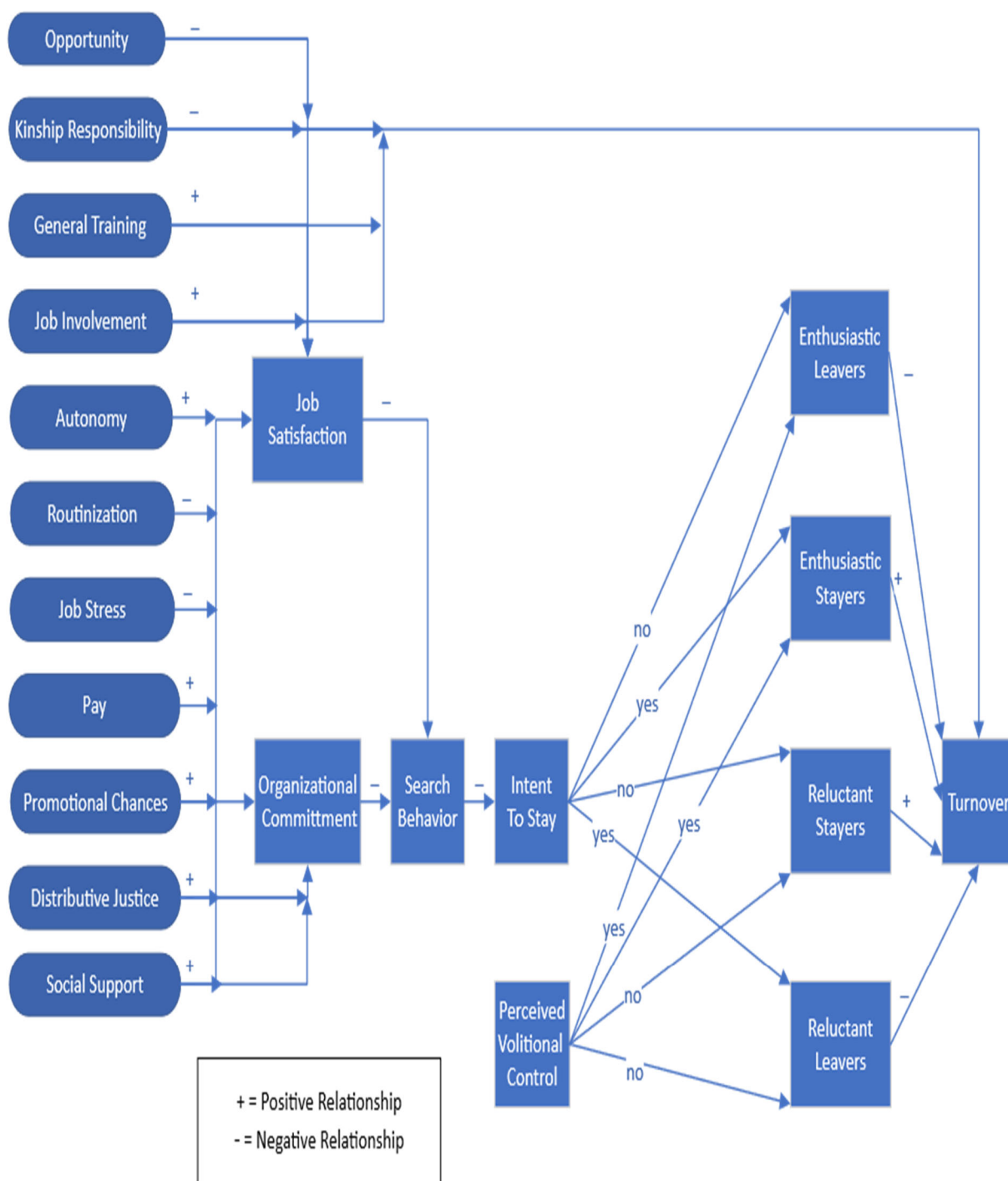
This conceptual framework has the advantage of comprehensively accounting for the primary variables related to retention (on the far-left side of the model), while also incorporating the subgroups of retention (on the right side of the model) (Hom et al., 2012). PWST has been criticized for not accounting for the primary variables (Bergman et al., 2012; Maertz, 2012). The primary variables have been included in this conceptual framework through the inclusion of the Causal Model of Turnover (Price, 2001). Hom et al. (2012) and Price (2001) both proposed that intent to stay was linked to job satisfaction and organizational commitment, and this served as the common link to unite these two theories into one conceptual framework, a framework that connects variable-centered retention analysis to the newer and still emerging person-centered retention analysis.

Research Questions

This study sought to answer the following research questions using the following hypotheses:

RQ1. What factors are associated with U.S. Army active-duty PAs intent to stay for at least 20 years of service?

The initial research question represents the traditional population-based regression retention analysis.

Figure 3*Conceptual Framework*

Note. Adapted from Price (2001) and Hom et al. (2012).

RQ2. What are the different subgroups of Army active-duty PA retention?

The second research question seeks to establish what can be learned from segmenting the populations into subgroups using LCA, a type of analysis to be discussed in Chapter 3: Methodology.

RQ3. Are there similarities between the subgroups from LCA and the subgroups (enthusiastic leavers, reluctant stayers, reluctant leavers, and enthusiastic stayers) of PWST??

(H₀) Profiles of U.S. Army active-duty PA retention are not associated with PWST.

(H₁) Profiles of U.S. Army active-duty PA retention are associated with PWST.

The third research question seeks to understand if PWST helps explain the subgroups created by LCA and how this study can further the understanding of PWST.

RQ4. Would factors associated with the intent to stay for at least 20 years of service predict the subgroups created by LCA?

(H₀) Factors cannot predict the subgroups created by LCA.

(H₁) Factors can predict the subgroups created by LCA.

The final research question attempts to predict the classes with factors found relevant to the intent to stay for 20 years in research question one.

Significance of the Study

Given that the data in this dissertation is from a survey of individuals, the focus of the study is on individual retention needs. Improving retention is a major priority in improving the effectiveness of organizations (Kaye & Giulioni, 2012). The success of every organization is dependent on its ability to retain its employees (Shibiti, 2019). Employee loss leads to the need to recruit, train, and develop replacements, which puts a strain on current employees and can lead to a decrease in morale and productivity (Bhattacharyya, 2017). One of the main goals of human resource management for military leaders is to retain all necessary personnel for operation needs

in all military specialties (Sminchi, 2016). Retention of military personnel is essential for morale and unit readiness and to decrease costs from recruiting, training, and replacement (Sminchi, 2016).

The resource dependency theory views an organization as a complex social unit attempting to survive and accomplish goals with limited resources in a competitive environment. (Pfeffer & Salancik, 1978). To survive, costs must be minimized, and the costs of poor retention include the cost of advertising, recruiting, retraining of fresh staff, lost productivity, and organizational knowledge (Jones & Gates, 2007). The loss of organizational knowledge from individuals who have left can compromise process improvement initiatives, as well as morale (Cottingham et al., 2011). This loss of knowledge leads to decreased employee satisfaction and profitability (Koys, 2001). For the military, costs of recruiting for the U.S. Army are \$1.5 billion annually; improving retention results in less recruiting costs, particularly among soldiers with the more expensive-to-obtain skill sets (Orvis et al., 2016).

U.S. Army PAs play a vital role in the success of the U.S. Army by preventing death in U.S. military personnel (Soliz, 2012). Coates et al., (2011) recommended a study into the retention needs of the Specialist Corps, with the largest profession in this Corps being U.S. Army PAs. The need to analyze the retention needs of just one military specialty at a time is supported by the diversity in retention recommendations from studies analyzing different military healthcare specialties (Booth-Kewley et al., 2017; Chaffin et al., 2008; Pehrson & Hamlin, 2002; Wojcik et al., 2020).

Despite the vital role retention plays in organizations, and the large amount of effort already spent trying to understand retention, there is still a lot of work needed in understanding retention (Monsen & Wayne Boss, 2009). This study builds upon previous theories by creating a

novel conceptual framework that unites variable-centered retention research to newer person-centered research. The conceptual framework more fully explains how an individual develops an intent to stay and how this relates with their PVC to create the four subgroups of the PWST. By analyzing retention factors from a population-based regression approach, and then through segmentation into subgroups, a twofold approach into the retention needs of this population was modeled, which may be later replicated in other populations. This twofold approach may expand upon current retention understanding, improve practical retention recommendations, and influence later retention models.

Limitations, Delimitations, and Assumptions

The following are the limitations, delimitations, and assumptions relevant to this study.

Limitations

The limitations of this study were:

- The survey only targeted currently serving U.S. Army active-duty PAs; those who had left the service were not contacted. Thus, the input of those who were no longer serving was not captured.
- The narrow focus on one military service (U.S. Army), one component of service (active-duty) and one military specialty (PAs) may limit the generalizability of the study, particularly to nonmilitary populations given the unique nature of military service.
- As a cross-sectional survey, this single glimpse hampers the ability to understand the process of retention decisions or changes in retention needs over time. It is also disproportionately more affected by temporary events which could affect individuals or groups, even if these events cause only short-lived changes in retention perceptions.

- The survey was conducted via official U.S. Army email, and not all potential respondents may have had sufficient access to email or time to complete it during the 2 month survey window.
- The data was a secondary dataset from a survey constructed by the U.S. Army Medical Center of Excellence Statistical Cell, based on a previous study of U.S. Army Physicians, and modified by several senior U.S. Army active-duty PAs. Some of the questions developed may not be relevant to junior PAs. The impacts of some of the high-level concepts in the questions may not be fully understood by some junior PAs.
- As a secondary data set, the survey was constructed prior to the conceptual framework developed by this study. As a result, the questions did not align as well to the conceptual framework. The results may have decreased links to the conceptual framework and decreased ability to use the framework to develop theoretical connections.
- Military members are frequently prompted to complete surveys and the survey may be considered long with 70 questions. Those who choose to complete the survey may disproportionately represent those with strong positive and/or negative feelings. Therefore, a response bias may be present among those who choose to complete the survey with results which may not represent the population.
- The data was self-report responses which are susceptible to dishonesty, poor introspection ability, and misinterpretation of answers.

Delimitations

The delimitations of this study were:

- While the original dataset consisted of survey respondents that included more specialties than just U.S. Army active-duty PAs, the analysis was limited to currently serving active-duty U.S. Army PAs.

Assumptions

The assumptions of this study were:

- that participants understood all the questions, answered them honestly, and that the answers reflected their retention needs.
- that the respondents are a representative sample of the population.
- that the survey instrument was valid and reliable.
- that the survey instrument accurately measured the retention needs of the respondents.

Chapter Summary

The purpose of this study was to provide recommendations for improving U.S. Army active-duty PA retention. Factors associated with the intent of active-duty PAs to stay for at least 20 years were analyzed. To understand these retention needs, multiple subgroups of Army active-duty PAs were created using LCA. PWST was used to help understand these subgroups. Finally, factors associated with the intent to stay for at least 20 years were evaluated to see if they could predict the subgroups of LCA.

Chapter one reviewed the background, problem statement, purpose, conceptual framework, research questions, significance, limitations, delimitations, and assumptions of the study. Chapter two will review the literature relevant to the issue. Chapter three will discuss the research methodology used in the study. Chapter four will cover data analysis. Chapter five will provide meaning behind the findings and a concluding summary of the study.

Chapter 2: Literature Review

Introduction to Retention Modeling

This chapter will review the relevant literature on retention, including general retention modeling, specific theories relevant to this study, an overview on military retention studies, and retention issues particular to U.S. Army PAs. Retention modeling involves complex phenomena requiring innovative methodologies and ever-evolving theories (Shelley, 2010; Steel, 2002). Early studies were often based around the idea that individuals who are dissatisfied with their employment begin to compare their present job to alternatives (Holt et al., 2007). If better alternatives are found, these individuals begin to have thoughts of quitting. However, efforts to predict the decision to quit have been more challenging, limiting the predictive value of this modeling (Allen et al., 2005).

Many researchers have attempted to comprehensively predict retention, create new explanatory constructs, and improve measurement of predictors (Hom et al., 2002). The models created from these efforts can be grouped into two categories: the first are variable-centered and seek linear relationships between commitment mindsets and retention outcomes (Meyer & Parfyonova, 2010). The other group of models are person-centered approaches and seek to identify how an individual's retention mindset evolves over time (Meyer, Stanley et al., 2013). While leading retention theories have improved understanding, the lack of significant predictive power may be in part due to the variance in content of the theories (Xu & Payne, 2018). Content which may vary because of the different populations studied.

Job satisfaction is a variable included in most of these models, often as being influenced by several other variables, and has been found to be inversely associated with turnover (Lu et al., 2016). Variables influencing job satisfaction have been difficult to measure and to determine

their magnitude of effect (Chen et al., 2011). The variables affecting job satisfaction can be classified as either individual, organizational, or environmental (Lu et al., 2016). Individual variables relate to employee factors, such as marital status and age (Griffeth & Hom, 2004). Organizational variables consider the relationship of the organization to the individual and include the individual's perception of the quality of interactions between individuals and the organization (Allen et al., 2005). Environmental variables relate to the organization's desirability and the ease of employees to change positions.

Causal Model of Turnover

The Causal Model of Turnover (2001) is a comprehensive variable-centered model that attempts to predict retention through understanding the relationship between all the variables that affect turnover decisions. In this study it was used to understand the relationships of the variables that lead to intent to stay (or leave). Price and Mueller (1981) criticized previous retention models for not building upon the understanding of turnover discovered in earlier research and not assessing the relative importance of variables affecting retention. Many of the primary variables in this model do not directly affect turnover. However, they do so indirectly through the secondary variables of job satisfaction, organizational commitment, job search behavior, and intent to stay (later defined as intent to leave).

Theory Explanation

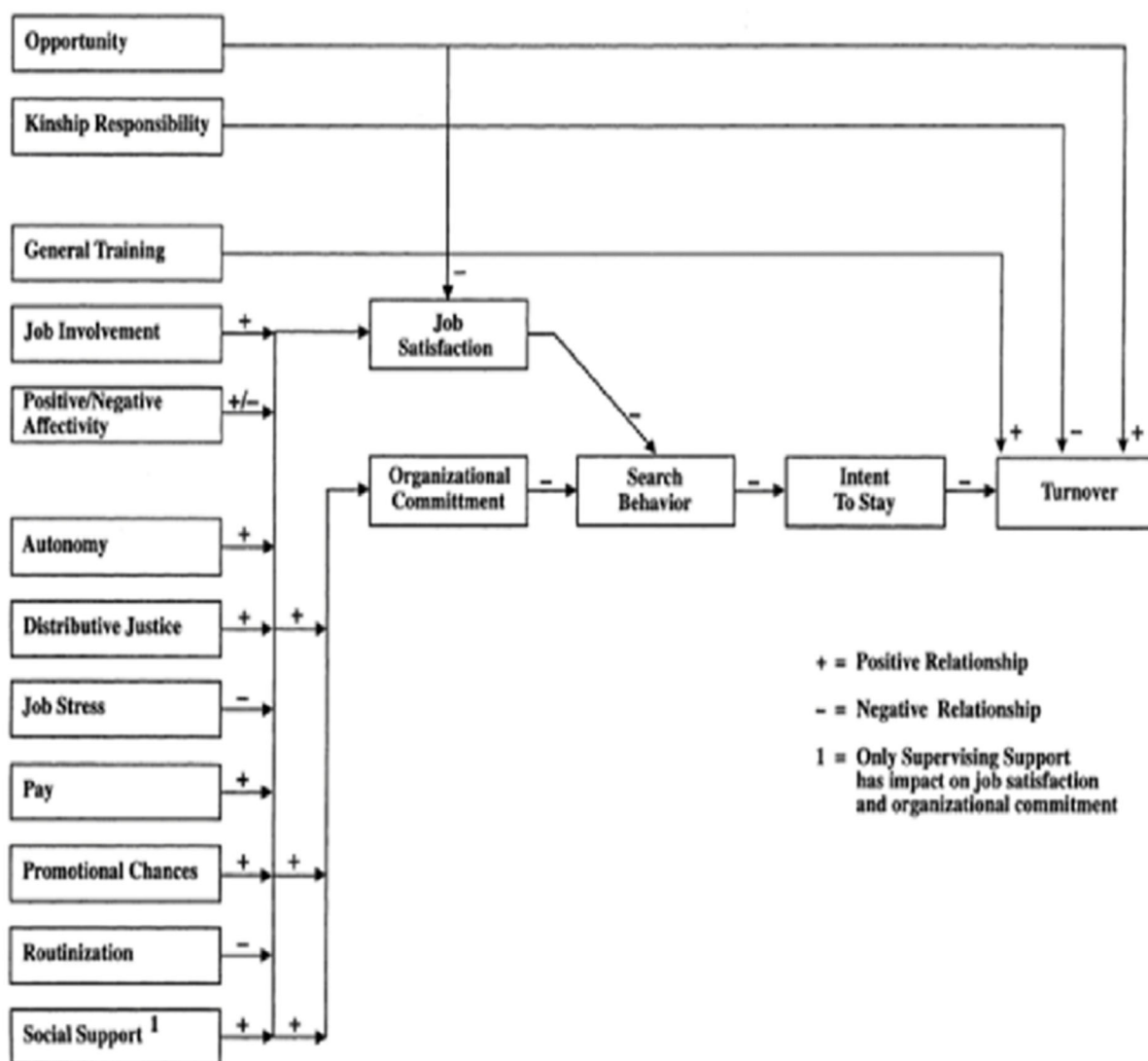
See Figure 4 for the Causal Model of Turnover and its depiction of the relationships between these variables.

Clearly defining the variables helps to understand this model. The first variable (and one of two environmental variables), opportunity, is the availability of alternate jobs (Price, 2001), which was first measured as the perception from an employee on how easy it was to find another

job (Price & Mueller, 1981). Opportunity was theorized to have a negative effect on both job satisfaction and turnover. As increased availability of alternative jobs increases the probability that alternative jobs are more favorable than current job, opportunity tends to decrease job satisfaction. Opportunity has been divided into local opportunity, if the alternative job can be reached by daily commute, and nonlocal, if it cannot (Price, 2001). The availability of desirable PA jobs, as noted by U.S. News and Reports (2020), who ranked PAs as the occupation with the second highest opportunities in 2020, supports increased opportunity for PAs. High opportunity should increase PA turnover according to this model. However, opportunity was found to predict turnover only minimally (Hom & Griffeth, 1995).

The second variable, kinship responsibility, is the degree of responsibility to family, and work-family conflict, and has been associated with intent to leave (Price, 2001). It was initially measured by marital status, presence of children, and the importance of being a parent (Price & Mueller, 1981). The sense of obligation to care for children was linked to increased intent to stay for women, although not for men (Price, 2001). The more an organization demonstrated value for kinship responsibility, such as through onsite daycare or paid parental leave, the less turnover occurred (Price, 2001). This variable can be influenced by the extent a spouse has a career that takes away from their ability to care for children (Price, 2001).

Given the time spent away from family with deployments and frequent moves, kinship responsibility is particularly impactful for military members. When spouses are supportive of a member remaining in the military, that member is less likely to leave (Garcia, 2012). The military lifestyle can pull soldiers away from their families and impair their ability to care for their family. Time spent separated from families is one of the top reasons soldiers leave the Army (Burrell et al., 2006).

Figure 4*Causal Model of Turnover*

Note. Reproduced with permission from Price (2001). See Appendix G for copyright approval.

The third variable (and the first of four individual variables), general training, is the extent that the knowledge and skills required for a job can be used on another job, and this variable has been linked to an increase in turnover (Price, 2001). While Price and Mueller (1981) measured nurses' level of education in their development of this model, education level does not

always equate to a transferability of skills. For example, some specialties specific to the military require advanced military education but have less transferability of skills to the civilian market than others, such as U.S. military PAs. U.S. military PAs are required to be nationally credentialed, a requirement that also eases their skill transferability into civilian jobs. This ease of transferability of skills to the civilian market supports increased military PA turnover.

The fourth variable, job involvement, is the willingness of staff to exert effort for the job, and was found to be created by motivation, central life interests, and work ethic (Price, 2001). Studies have not linked job involvement to job satisfaction, nor to be a predictor of turnover (Griffeth & Hom, 2004). It is difficult to generalize U.S. Army PA job involvement, although job involvement can be considered on an individual basis.

The fifth variable, positive and negative affectivity, is the tendency of individuals to interpret activities as positive or negative. Research has shown affectivity to be different from job satisfaction (Price, 2001). Positive affectivity has been linked to retention; however, it may also bias the measurement of other variables, and Hom and Griffeth (1995) has argued for this variable to be excluded. An employee with high positive affectivity may perceive the job in a positive light, which increases job satisfaction, but high positive affectivity may also improve the perception of other covariables (Price, 2001). Like job involvement, it is difficult to generalize this variable for all active-duty PAs, but positive and negative affectivity can be considered on an individual basis.

The sixth variable (and the first of seven structural variables), autonomy, is the degree an employee perceives that they can exercise independence and the power of discretion (Hom & Griffeth, 1995). In other words, autonomy is often where an employee feels they can make decisions about how they do their job (Price & Mueller, 1981). Autonomy was found to be

moderately predictive of turnover (Griffeth et al., 2000). Price (2001) contends that a limitation on the predictive ability of autonomy is the limited ability to measure autonomy. The U.S. Army PA has some autonomy, as generally they are the only medical provider for a battalion, but autonomy can be limited by medical and military policies, commander control, and medical command oversight.

The seventh variable, distributive justice, is the degree that rewards and punishments are related to performance (Price, 2001). It was measured by how much money employees felt they were paid compared to how much effort they put into the work (Price & Mueller, 1981). Price (2001) concedes it is difficult to accurately measure distributive justice. Dailey and Kirk (1992) measured distributive justice as the perceptions of ineffective performance appraisals and linked them to an intent to quit. Like most organizations, U.S. Army PAs have variable rates for being rewarded for performance. These rewards include positive or negative formal or informal reviews, awards, advanced training opportunities, duty assignment selection, additional duties, and flexible time off. Perception of the fairness of these rewards is often based on individual perception, making distributive justice a difficult variable to measure (Price, 2001).

The eighth variable, job stress, is the difficulty of fulfilling job duties due to high workload, role ambiguity, resource inadequacy, and role conflict (Shelley, 2010). It has been difficult to develop reliable measurements of job stress (Price, 2001) and job stress has been found to have small to moderate effects on turnover (Griffeth et al., 2000). Job stress has an impact on U.S. Army PA retention due to the demands of this unique brand of austere medicine, which requires maximizing the medical readiness of troops through providing medical care and oversight, sometimes during intense situations.

The ninth variable, pay, is satisfaction with the financial benefits of the job and has been measured by simply recording total yearly income (Price & Mueller, 1981). Analysis of this variable has demonstrated a lack of predictiveness of turnover (Hom et al., 2012). The pay for U.S. military PAs varies, depending on rank and years of service, and includes significant benefits, such as free healthcare. While the pay of U.S. Army PAs is fixed and published, civilian pay is not. Therefore, it can be hard to make comparisons between civilian and military pay, and perceptions of military pay adequacy compared to civilian counterparts vary by individual.

The tenth variable, promotion chances, are the perception by an employee of their chances for promotion (Price & Mueller, 1981). Promotion impacts retention by increasing job satisfaction and organizational commitment (Price, 2001). For U.S. Army PAs, promotion chances are particularly important, as failure to promote can lead to a removal from service. Promotion rates for PAs to the historically first competitive rank of Major significantly increased in 2020, from 35% to 74%, which should have a positive effect on their retention (Department of the Army, U.S. Army Human Resources Command, 2021).

The eleventh variable, routinization, is the degree to which a job is routine and repetitive, which has been previously measured by employee assessment (Price & Mueller, 1981). Routinization is influenced by standardization, mechanization, and the need for continuous processing (Price, 2001). Routinization has mixed results on retention and may vary heavily based on the occupation. Some routinization is present for U.S. Army PAs, although it can be broken up by unique training opportunities, deployments, and frequent changes in location and job duties. Being a military PA may be perceived as less routine than some civilian PA occupations and this variable may have a positive effect on retention.

The twelfth and final variable listed by Price (2001), social support, consists of support from supervisors, peers, and family in assisting with job related problems (Price, 2001). High social support for work related problems was weak to moderately shown to increase retention, while low support significantly decreased retention (Griffeth et al., 2000). Social support is particularly important for all military members, as family members go through unique advantages and challenges of living a military lifestyle. Challenges may include frequent moving and physical absence of military members due to deployments and other duties.

Critique and Summary

The Causal Model of Turnover (Price, 2001) has had a deep impact on retention modeling with 2,217 citations as of January 19, 2022. A considerable number of studies have supported this theoretical model (Brewer et al., 2012; Çamveren & Kocaman, 2021; Chang et al., 2013; Harrison et al., 2006; Sawatzky & Enns, 2012). As a practical model that can help managers reduce turnover, the theory continues to demonstrate its relevancy (Hom et al., 2017). Newer theories still consider how the variables organizational commitment and job satisfaction are sources of intent to stay, just as in the causal model (Liu & Raghuram, 2021).

A major limitation of this theory is the reduction of the decision to quit into a series of variables that may not account for how all employees quit (Morrell & Arnold, 2007). Translating complex, socially influenced decisions over time into simple linear relationships eliminates the human emotion, disproportionate impact from major and more recent events, differing motives, and impulsiveness that affect real life retention decisions (Liu & Raghuram, 2021). Griffeth and Hom (2004) found that intent to leave was consistently related to turnover, but only accounted for 24% of the variance in turnover decisions. Due to this lack of predictiveness and stagnation

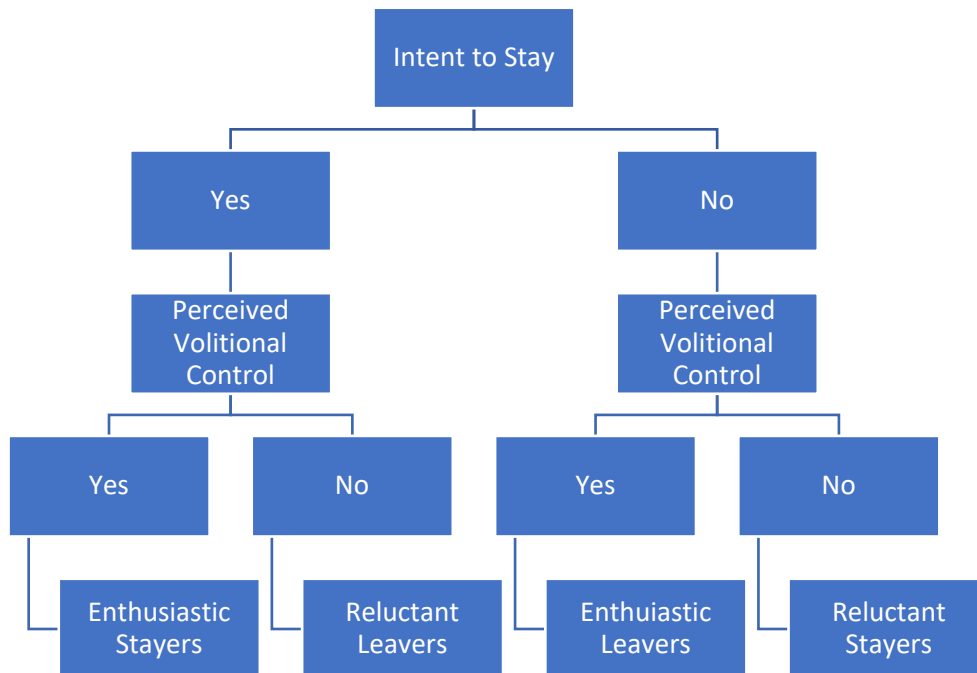
in innovation of the variable-based approach, newer research has focused on events and mind states just prior to turnover decisions that impact retention (Chen et al., 2011; Hom et al., 2012).

Proximal Withdrawal State Theory

Theory Explanation

PWST classifies intent to stay or leave into four categories. These four categories are created by two variables, each containing two possibilities: the intent to stay (or leave) and high (or low) PVC over the ability to make the decision to stay or leave (Hom et al., 2012). Intent to stay has been linked to job satisfaction, organizational commitment, and job embeddedness (Hom et al., 2012). PVC is believed to decrease when job opportunities are fewer, termination pressure high, and work-life conflicts increased (Liu & Raghuram, 2021). See Figure 5 for the classification of categories in PWST, which creates four groups: enthusiastic stayers, reluctant stayers, reluctant leavers, and enthusiastic leavers.

Enthusiastic stayers have a powerful desire to stay and high PVC over this desire. Managers often attempt to increase worker engagement to increase the number of enthusiastic stayers among their employees (Wefald & Downey, 2009). Enthusiastic stayers are most likely to remain in the organization the longest of the four subgroups (Hom et al., 2012). They tend to have affective commitment which is formed from having personal goals aligning with the organizational goals (Xu & Payne, 2018). Enthusiastic stayers have low levels of work avoidance and counterproductive work behaviors (Meyer et al., 2004).

Figure 5*Proximal Withdrawal State Theory Classifications*

Note. Adapted from Hom et al. (2012).

Reluctant stayers would like to leave but do not have enough PVC to leave (Hom et al., 2012). They are often marginal performers (Trevor & Nyberg, 2008) who may express work avoidance and actively disruptive behaviors, such as sabotage, while offering few benefits to employers (Burris et al., 2008). Once barriers to them leaving are removed, they may find better-fitting jobs or roles (Hom et al., 2012). Contractual stayers are a subclassification of reluctant stayers who do not have PVC due to a contract, such as in military obligations. This subgroup tends to have less troublesome behavior as the end date for not having PVC is known and performance expectations are specified, and they may seek further employment after their contract ends (Balfour & Wechsler, 1996).

Reluctant leavers may be forced to leave due to widespread layoffs, mediocre performance, obsolete work skills, earning salaries greater than their productive capacity, and/or quarrels with their supervisors (Bhattacharya, 2008). Evaluation systems that rank employees and eliminate lower ranking ones, or pay based on performance, may inform employees of their limited employment potential in an organization (Becker & Cropanzano, 2011). While employees may exhibit poor and/or counterproductive work after being made aware of their impending firing, it is usually not long until they are removed, unless protections such as from unions for their firings exist (Trevor & Nyberg, 2008).

Enthusiastic leavers go through a process of feeling the need to leave, which evolves into a specific plan to leave after defined objectives are complete (Steel, 2002). They may have searched for and found another job or been presented with one, or they may not have a plan after leaving (Lee et al., 2008). The decision to leave may have evolved over time, or from a sudden realization, and the reason may be from dissatisfaction and/or pressure to leave from external sources (Hom et al., 2012).

Critique and Summary

PWST has been praised for bringing together how one quits from the process models (unfolding model), with the why one quits from the content models (job embeddedness theory) (Maertz, 2012). Research suggests that understanding the needs of each subgroup separately may help better guide retention decisions (Liu & Raghuram, 2021). However, the data is still scarce and support for this idea is still limited. Despite this advancement in retention modeling, PWST may not translate to actual improvement in retention predictions (Maertz, 2012). Predicting when an employee may leave is difficult, due to an inability to predict future events and the events effect on an individual's retention intent over time (Kulik et al., 2012). Even if it was possible to

associate retention with certain variables, the variables identified may not be the reasons why an employee left, limiting the usefulness of retention modeling as a predictive tool (Maertz, 2012).

PWST has been criticized for not accounting for traditional retention variables that increase a preference for staying or leaving, such as social support, which may affect individuals differently within the same PWST subgroup (Bergman et al., 2012; Maertz, 2012). Additionally, limiting the intent to stay and the PVC to the binary “yes” or “no” may be oversimplified (Maertz, 2012). If so, there should be many more relevant categories than the four of PWST (Maertz, 2012). As an example of this complexity, a person could be enthusiastic to return to work after the end of parental leave, but at the same time enthusiastic to stay home to care for a newborn child (Bergman et al., 2012). Furthermore, reluctant stayers who want to leave because they do not fit the job well may be different than reluctant stayers who want to leave because they do not fit well into work social groups.

Additionally, the dichotomous choice of “yes” or “no” to PVC and intent to stay does not account for the strength of PVC or intent to stay (Maertz, 2012). Having a strong intent to stay versus a weak intent to stay (or both a desire to leave and go, or even being neutral) may be relevant for modeling purposes (Maertz, 2012). Incorporating the strength of each dimension and the reasons behind each choice may lead to a better understanding of retention (Maertz, 2012). Despite these limitations, combining many previous models into one represents a large advancement in retention modeling (Maertz, 2012). To understand how this theory advanced retention research, both the process model (unfolding model) and the content model (job embeddedness), which were combined to create PWST, will be explored next.

Unfolding Model

Theory Explanation

The unfolding model explains the process an employee follows when deciding to stay, or leave, based on responses to significant events, called shocks, which are compared to a preexisting plan of action (Kulik et al., 2012). An individual's values, goals, job satisfaction, and job fulfillment affect the perception of these shocks. The shocks may be negative or positive and are significant enough to make individuals reconsider their commitment to an organization (Holt et al., 2007). Shocks may lead individuals to go down a path leading to a decision to leave an organization (Kulik et al., 2012). Individuals reconcile the shock with the script, a preexisting plan of action formed by observing others and by self-reflecting on their commitment to an organization (Holt et al., 2007). If the shock violates their values, goals, and strategies, they may seek alternatives to their current job (Mitchell & Lee, 2001).

The most important change influencing individual retention decisions may be changing commitment (Gao-Urhahn et al., 2016). Positive or negative shifts in commitment because of these shocks influence future job experiences, which further reinforces shifts in intent to stay (Chen et al., 2011). The momentum from more recent shocks may be more important than older shocks or current job satisfaction (Holt et al., 2007).

Critique and Summary

Understanding the unfolding model can help employers strengthen their organizations retention plans (Holt et al., 2007). For example, harnessing employees' desire to update skills to retain long term marketability can lessen the effect of negative shocks that decrease retention. Critics of the model state that employees may not travel down clearly definable paths because of

the shocks (Maertz & Campion, 2004). Additionally, shocks may be gradual and cumulative rather than episodic (Maertz & Campion, 2004).

The unfolding model helps explain how individuals move from one PWST classification to another (Hom et al., 2012). For instance, the shocks of the unfolding model can move an enthusiastic stayer into becoming an enthusiastic leaver. Hom et al. (2012) noted the emphasis on understanding events just prior to turnover decisions in the unfolding model supports this same proximal focus in PWST. Hom et al. (2012) argues this emphasis is more important than focusing on variables more distal to turnover decisions, as in other models such as job involvement in the causal model. The unfolding model has expanded insight into turnover which has been valuable in multiple studies (Holtom et al., 2008). However, most of these studies have been qualitative studies using exit interviews which can suffer from recall errors and self-serving biases (Hom, 2011).

Job Embeddedness Theory

Theory Explanation

Job embeddedness theory is a content retention theory that holds that employee retention is a combination of fit (a match to the job), links (to work and outside of work), and sacrifices (benefits and costs of job) (Mitchell & Lee, 2001). The combination of fit, links and sacrifices create different commitment types that have different retention rates (Meyer & Herscovitch, 2001). The first commitment type, affective commitment, results from agreement of a person's values with the organization's values and has been shown to have the lowest rates of turnover of the three commitment types (Xu & Payne, 2018). When people have affective commitment as well as other commitment types, the affective commitment dominates in importance due to the power of the internally driven nature of affective commitment (Meyer et al., 2006).

Exchange-based commitment, employees who work to obtain an external reward, are less committed (Xu & Payne, 2018). This commitment is created by some combination of the two subtypes, continuance commitment and normative commitment. Continuance commitment is commitment that evolves from an awareness of the cost of leaving (San-Martín et al., 2020). Normative commitment is commitment due to loyalty and obligation from receiving a benefit that requires repayment. Lacking a strong affective commitment but having a strong continuance commitment and/or normative commitment results in this exchange-based commitment (Xu & Payne, 2018). Less internally driven, the exchange-based commitment is weaker than affective commitments and results from the organization providing a desired end state for the individual.

Weak commitment results from a lack of affective and exchange-based commitments (Maertz & Campion, 2004). This group experiences the highest rates of turnover and is the least desirable commitment type for employers. The length of commitment and the motivations behind commitments are fundamental to understanding retention (Singer & Willet, 2003). Some studies have found that commitment changes over time (Bentein et al., 2005), with a decrease in commitment translating into lower retention rates (Meyer & Herscovitch, 2001). Affective commitment may have a moderating effect on this commitment change, as affective commitment tends to be stable over time (Atherton et al., 2021; Gao-Urhahn et al., 2016).

Critique and Summary

Job embeddedness has spurred further theoretical advancements into why people stay at their jobs (Kiazad et al., 2015). It has been expanded to look at embeddedness of families with an individual's employment (Ramesh & Gelfand, 2010), communities and individual's employment (Feldman et al., 2012), and how the nature of different occupations affect embeddedness (Ng &

Feldman, 2012). It also intersects with the unfolding model, as an elevated level of job embeddedness helps protect against the shocks of the unfolding model (Burton et al., 2010).

The reason people stay, and the reason people leave, has been found to be different (Steel & Lounsbury, 2009). However, job embeddedness does not account for this difference and modern theories have moved away from models that looked only at job attitudes to explore other determinants of retention (Li et al., 2016). Job embeddedness has also been criticized for focusing on time distal to retention decisions that may limit its predictive ability and usefulness (Maertz, 2012). While job embeddedness has been associated with increased retention, elevated levels may also be harmful, leading to decreased social networking and increased work-family conflicts over time, which can impact performance (Ng & Feldman, 2012). Despite its limitations, job retention studies continue to incorporate the job embeddedness theory.

Moskos Institutional-Occupational Model

Theory Explanation

The Moskos Institutional-Occupational Model has been developed from military studies of retention (Moskos et al., 2000). It considers an individual's commitment to their institution and their commitment to their occupation. These two commitments may exist on a competing continuum of degree of commitment to their institution or to their occupation (Griffith, 2011), or these two commitments may exist independently of each other (Stahl et al., 2016). These commitments have been argued to be separate from extrinsic or intrinsic rewards used in other models (Coates et al., 2011). In studies of military retention, a soldier's commitment to their specific occupation, such as being a PA, has been compared to their commitment to the military (Griffith, 2008; Griffith, 2011). Researchers have found that military members committed to the

military had higher retention rates than those more committed to their occupation within the military (Griffith, 2008; Griffith, 2011; Moskos et al., 2000; Stahl et al., 2016).

Critique and Summary

The transferability of this theory suffers from its development only among military studies and has had limited impact outside of military retention studies. All studies completed using this theory to date were on military populations. However, this limitation does not affect this study, as this study focuses on military retention. The importance of the two types of commitment in this theory has not been demonstrated in military officers. An additional consideration is that the high demand for civilian PAs may diminish commitment to the military among some participants in this study.

Civilian PA Retention

Only a few studies have looked at civilian PA retention. Henry and Hooker (2007) studied PA retention, using interviews with eight PAs working in rural Texas towns, and found confidence in ability to provide adequate healthcare, desire for small town life, and community involvement were important to retention. Larson et al. (1999) found that PAs who started their careers in rural areas were more likely to leave for urban areas than those who started their careers in urban areas leaving for rural areas. Taylor et al. (2020) did a small qualitative study of the retention issues of American PAs working in England. Given the difference in medicine in England and the PA profession in England being in its infant phase (Taylor et al., 2020), and that only two small studies focused on rural American PA practice, PA-specific retention literature has little to offer to a study of U.S. Army PA retention.

The annual turnover of a health system was 19% among PAs and Nurse Practitioners (NPs), and highest among those within the first 2 years of practice (Erickson et al., 2021). To

address this problem within this health system, a small pilot program of 19 new PAs/NPs that gradually increased daily patient load from a smaller starting load to the standard load and provided mentors focused on clinical confidence and competence, saved money from decreased turnover despite the additional costs of the program (Erickson et al., 2021). Another solution proposed to address early turnover is the development of a clinical ladder system for NPs and PAs with increasing competency levels being demonstrated as one moves up the ladder (Kauffman et al., 2021).

PAs and NPs were created largely because of shortages and maldistribution of medical staff (World Health Organization, 2020). Their role in hospital settings increased after the number of hours medical residents could work was limited (Evans, et al., 2019). More physicians are going into specialty care due to higher salaries (Kacik, 2021). While there is a shortage of over 20,000 primary care physicians as of 2020, NPs more than doubled in number from 2010 to 2017 and PAs grew 58% (Kacik, 2021). The proportion of primary care provided by physicians is decreasing as PAs and NPs have begun providing more of the care (Barnes et al., 2018; Wasserman & Fiks, 2021). Currently, there is almost 300,000 NPs (American Association of Nurse Practitioners, 2019) and 115,000 PAs (National Commission on Certification of Physician Assistants, 2021).

The scope of practice of PAs and NPs is determined by state law and has been increasing in many states (Runy, 2007). This movement towards increased scope of practice was expediated on a temporary basis due to the emergency needs for healthcare during the pandemic (Kacik, 2021). States with independent scopes of practice for NPs have an increased number of NPs (Reagan & Salsberry, 2013), and patients in these states were more likely to see a NP (Kuo et al., 2013), which led to increased primary care access (Stange, 2014) and more cost-effective

treatment (Conover & Richards, 2015). However, state medical societies are pushing back against increased scope of practice movements of PAs and NPs, claiming the result is more unnecessary referrals and imaging, leading to inflated costs and worse outcomes (Louisiana State Medical Society, 2021). However, many studies have demonstrated the care to be similar and healthcare payers, large companies providing their own healthcare and private equity-backed ventures, are building their own services using PAs and NPs (Kacik, 2021).

The fight over PA and NP scope of practice has led to differences in scope of practice for each profession, which vary depending on the state. States with independent practices for NPs leads to increased NP employability and salaries (Reagan & Salsberry, 2013). PAs are regulated by state medical boards in 43 states, who are opposed to increased scope of practices for PAs (American Medical Association, 2018), while NPs are regulated by nursing boards. In states with independent practice for NPs, NPs are often preferred due to not needing physician oversight. The increased marketability of NPs not needing physician oversight has closed opportunities for PAs (Bingham, 2020). NPs currently have independent practice ability in 26 states (American Association of Nurse Practitioners, 2022). While the independent practice debate is beyond the scope of this dissertation, complications for civilian PA employment may increase military recruitment opportunities for civilian PAs and decrease the retention losses, as military PAs may view civilian alternatives as less competitive.

Military Retention Studies

Just as in civilian recruiting, military recruiting and retention needs are inversely related; increased retention decreases the need for recruitment, so as retention decreases, the need for recruitment increases (NATO, 2007). However, improving military retention is more efficient than improved recruiting (NATO, 2007). New recruits do not have the skills developed by more

experienced soldiers; a reality particularly important among those requiring specialized skills like military PAs (Chun, 2005). The superior skillsets of experienced personnel mean that increasing retention not only decreases retention needs, but also improves mission readiness and military stability (Bosse, 2011).

An advantage of studying military retention is the availability of data sets with large numbers of participants (Holt et al., 2007). However, military populations are homogenous, based on common experiences and, unlike many civilian employees, members of the Armed Forces cannot spontaneously quit (Shelly, 2010). Lengthy military obligations and complex separation from military service procedures are significant in retention studies, as the predictive value of the intent to leave decreases as time increases between the intent to leave and actual leaving (Hayes et al., 2006). The relative homogenous nature of military service populations and their contractual obligations may lessen the transferability of military retention studies to general retention models (Holt et al., 2007).

Job commitment profiles have been shown to be stable for U.S. Army Officers over time (Xu & Payne, 2018). While only 9-18% of civilian employees have affective commitments to their job (Meyer et al., 2012), most U.S. Army officers have affective commitments (Xu & Payne, 2018). The turnover process among military servicemembers has been shown to be like that of civilian employees, with leavers gradually moving to weaker commitment profiles. Multiple studies have shown few differences in retention processes between military and civilian personnel (Meyer, Kam, et al., 2013; Xu & Payne, 2018). However, researcher bias, from pressure to generalize a study's findings to a general population for publication, should be considered.

The U.S. Army often assumes that student debt and compensation are the main drivers in recruitment and retention (Shelly, 2010). Retention efforts have often focused on easy-to-measure and change factors such as loan repayment programs, residency training, and special pay (Coates et al., 2011). However, junior officers may have different motivational factors, as younger generations have stressed family stability, quality of life, and job purpose over financial incentives (Cennamo & Gardner, 2008).

Satisfaction surveys are a common tool of leaders to understand these retention needs, such as a recent satisfaction survey of military physicians (Wojcik et al., 2020). Military retention surveys are used by the U.S. Army, Department of Defense, and Congress to assist in making changes aimed at improving recruitment and retention of military personnel (Shelly, 2010).

Retention Factors and U.S. Army Physician Assistants

While some literature addresses U.S. Army medical retention, it is usually focused on a specific specialty, most commonly physicians and dentists (U.S. Government Accountability Office, 2020a). This is despite a study of all U.S. Army officers ranking the U.S. Army Specialist Corps (comprising U.S. Army PAs, Occupational Therapists, Physical Therapists, and Dieticians) as the lowest acceptor of U.S. Army retention incentives (Coates et al., 2011). The Department of Defense recognizes military healthcare as important for overall recruitment and retention of all servicemembers (Marble, 2015), which further justifies a closer look at U.S. Army PA retention, as the face of U.S. Army healthcare to soldiers is often the U.S. Army PA (Salyer, 2002).

Promotability

Little has been published about U.S. Army PA retention, although Soliz (2012) examined U.S. Army PA retention relating to promotion opportunities. Soliz described the lack of promotion opportunities as stemming from all U.S. Army PAs being promoted from warrant officers to commissioned officers in February 1992. As these newly commissioned PAs did not have the education and experience needed to hold higher ranking positions, most of the authorizations for higher ranks were distributed to the corps of other U.S. Army medical specialties (Soliz, 2012). As U.S. Army PAs later gained seniority, the lack of authorizations for PAs to be promoted into higher ranks led to a lack of promotion opportunity. Furthermore, the reduction in senior level PAs decreased the number of PA leaders available to mentor, teach and coach junior PAs (Soliz, 2012). This lack of mentoring was said to make junior PAs less competitive for senior positions and less motivated to stay as they became more senior PAs.

Detro (2010) also found a problem with the lack of promotability but looked specifically at Special Operations PAs. Detro noted that PAs serve in traditional operational units for at least 1 to 3 years after becoming PAs. At 8 years they are eligible for promotion to Major and if they desire to stay in Special Operations, they need to compete for one of only a few positions for Majors within Special Operations. Otherwise, they must leave Special Operations to be competitive for future promotions. By increasing senior Special Operations authorizations, Special Operations could benefit from retaining experienced PAs to better accomplish the unique missions of Special Operations medicine.

Not being promoted can have negative effects job satisfaction, and lead to being involuntarily separated from the military. Consequently, limited promotions can create an absolute barrier to military retention for those who want to stay. The promotion to Major is

important as the first promotion PAs face, which has historically low promotion rates. Former enlisted PAs are initially commissioned as First Lieutenants, and virtually all are promoted to Captain. Major is also often the highest rank where PAs can still focus on patient care (rather than leadership positions) and Majors are often senior clinical mentors for junior PAs. Promotion rates for U.S. Army PAs to Major historically have been around 40%, while the average for the rest of the Army has been around 80% (E. Driver, personal communication, July 14, 2020). In 2021, promotion rates for Major among active-duty U.S. Army PAs increased significantly to 74% (Department of the Army, U.S. Army Human Resources Command, 2021). This recent increase in promotability suggests the retention needs of PAs need to be reevaluated more broadly than just looking singularly at promotability.

Soliz (2012) noted the only branch of the six Army Medical Department branches without a general officer was the Specialist Corps. Soliz (2012) argued this put the Specialist Corps at a disadvantage in attempting to increase the number of PAs able to be increased in rank. With an increase in the number of PAs able to reach senior ranks, promotion rates would increase and there would be a decrease in experienced PA loss due to non-promotions (Soliz, 2012). Fortunately for the Specialist Corps, its senior leader will soon be a general officer, eliminating this historic problem.

Pay and Job Opportunities

Salyer (2002) noted an increase in U.S. Army PA pay in 1992, when U.S. Army PAs were switched from warrant officers to commissioned officers. Salyer (2002) linked this pay increase to improved retention rates for U.S. Army PAs. However, Salyer (2002) fails to provide data to support this claim. U.S. News and World Report (2020) ranked PAs in their top five

occupations due to salary, job market, and future growth, supporting civilian competition for military PAs as being significant.

Among military physicians, compensation was shown to be a minor part of retention, particularly as competitiveness of pay and other benefits (such as retirement eligibility) increased with longer lengths of service (MacManus & Strunz, 1993). However, Marble et al. (2020) found ensuring pay competitiveness of military and civilian physicians was a major concern. When considering another medical specialty, U.S. Army Dentists at the rank of captain listed pay as the number one retention concern (Chaffin et al., 2008). When all U.S. Army officers were given the choice between military education programs, choice of duty locations, or a cash bonus, U.S. Army captains virtually all chose the cash bonus (Coates et al., 2011). However, this was all U.S. Army captains, and the noncash options may be more attractive to U.S. Army medical officers.

Well-paying and abundant civilian job alternatives have challenged Army PA retention (Soliz, 2012). Officers who develop skills that transfer to the civilian market, such as general leadership and organization skills, early in their career are incentivized to switch for higher wages in the civilian sector (Glaser, 2011). In contrast, officers who develop skills specific to the military tend to remain in the military longer (Glaser, 2011). Outside employment opportunities and the overall general economy have been shown to affect U.S. Air Force Officer retention (Armstrong, 2000). U.S. Army PAs are nationally certified and able to easily transfer their skills into civilian job opportunities which make civilian alternatives more pertinent when they make retention decisions.

Advanced Education

U.S. Army PAs may pursue many additional advanced educational opportunities in the military that include additional degrees such as doctorates in education and epidemiology,

master's in public health, and clinical doctorates in orthopedics, emergency medicine, or surgery (Salyer, 2002). The U.S. Army is the largest source of advanced education programs for PAs world-wide, and to participate in them, U.S. Army PAs must sign up for additional years of service (Salyer, 2002). The effects of these opportunities on PA retention are unknown. While those who participate in these programs are obligated to additional military service, it is unknown at what rates they would stay even if not given these opportunities.

Soldiers motivated to improve occupational opportunities are more likely to stay in the military for advanced education when rewarding civilian positions require this training, and more likely to stay as their length of military service increases (Taylor et al., 2015). As noted previously, U.S. Army PAs already have an extended length of military service due to their military experience prior to being a PA.

Specialty training was shown to be an effective tool for non-specialist Army Dentists, as specialty training was listed as their number one retention reason (Chaffin et al., 2008). It has also been effective for military physician retention (Richter & Hanhart, 2012). An advantage of advanced education is it selectively retains the highest skilled professionals (Snodgrass, 2014).

Autonomy

U.S. Army PAs have a degree of autonomy in their medical practice due to often being the only medical provider in their unit. However, PAs have many additional duties assigned to them as military officers, which are often not obligations for civilian providers. Furthermore, unlike most civilian providers, as military PAs gain rank and seniority, fewer clinical duty options are available and leadership roles become required to continue to serve.

U.S. Army physicians rate autonomy as one of their greatest retention concerns (Wojcik, 2020). U.S. Army surgical residents (Modlin et al., 2020) and emergency medicine residents

(Takayesu et al., 2014) rated perceived inadequate level of autonomy as a significant predictor of burnout. Senior dentists listed lack of autonomy as their main concern of retention (Chaffin et al., 2008). *Senior* dentists finding autonomy more important contrasts with some more general military studies which have found *younger* generations tend to list autonomy as more important (Coates et al. 2011; McMahon & Bernard, 2019; Snodgrass 2014). This difference in the value of autonomy may be explained by military medical professionals having different specialty pay, work conditions, promotability issues, opportunities to work autonomously, and civilian alternatives than nonmedical servicemembers.

Gender

The history of males dominating the numbers of military members and the role of masculinity in war has made the role of women in the military more polarized (Lundquist, 2008). Women currently represent 16.5% of the U.S. active-duty military, 15% of the U.S. Army active-duty Army and 20% of the U.S. Army active-duty Officers (U.S. Government Accountability Office, 2020b). Women are 23.7% of the U.S. Army active-duty PAs (C. Smith, personal communication, May 16, 2022). While women are 28% more likely to leave the service than men, the Department of Defense was not found to have a plan to specifically recruit and retain women (U.S. Government Accountability Office, 2020b). An additional concern is that 67% of military women have reported being sexually harassed (Antecol & Cobb-Clark, 2001).

Women in the military may experience less gender inequality in pay than in civilian occupations (Janda, 2012). The Army has extensively pushed for equal opportunity through training and mechanisms to report inequalities (Moore & Webb, 2000). Studies of military medical officers have failed to demonstrate a significant link between gender and intent to stay (Chaffin et al., 2008; Wojcek, 2020). An additional benefit of female military PA retention is

increasing access to female health care providers, which is important for positive outcomes for women's health, particularly difficult to maintain in remote areas (Braun et al., 2015).

Trust in Leaders and General Military Commitment

Most U.S. dental officers felt their leaders knew the issues with retention, but the majority felt their leaders were not working to address them (Chaffin et al., 2008). The number one factor associated with U.S. Army Social Worker retention was the belief their leaders supported the mission of social work (Pehrson & Hamlin, 2002). Throughout the military, many junior officers may have left the army due to lack of trust in senior Army leaders (Coates et al., 2011), which has been cited as the most crucial factor in Army retention (Allen, 2011). This corresponds with studies which show satisfaction with supervisors is correlated with increased intent to stay (Allen & Bryant, 2012).

Americans have consistently ranked the U.S. military as the institution with which they have the most confidence in leadership (Jones & Saad, 2011). However, leadership failings, with the treatment of prisoners at Abu Ghraib, poor conditions at Walter Reed Army Medical Center, the Fort Hood shooting, and soldier suicide rates may reflect failures in Army leadership (Allen, 2011). A lack of training and mentoring of senior-level leaders may have been linked to the relief from command of several battalion and brigade commanders (Doty & Fenlason, 2013). In recent years, the military has seen the firing or resignations of Secretaries of the Army, the Chief of Staff of the Air Force, and several general officers, including the Commander of US Central Command (Doty & Fenlason, 2013). Lack of trust in leaders has led to the perception among some soldiers that many of the best are leaving the Army (Allen, 2011).

While two-thirds of soldiers agreed they trusted other members of their organization, one in five disagreed with the statement that they could believe something an Army senior leader

said was true (Allen, 2011). Forty percent said they no longer believed the Army was as committed to them as they were to the Army (Steele, 2011). Only 25% agreed with the statement that the Army allows candid opinions without fear of repercussions, and only 40% agreed people can make honest mistakes without ruining their career.

Overall personal commitments to the military decline with military budget cutbacks, decreased domestic support, and undesirable mission changes (Cohen, 1992). Strong identification with one's nation and its military predicted the desire for West Point cadets to make the military a career (Franke, 2000). Soldiers' characteristics matching the model for an ideal soldier and their feeling of being prepared for combat increased retention rates (Griffith, 2011). Conversely, the less they matched the identity of the ideal soldier and the less they felt prepared for combat, the lower their retention rates and the increased rate of post-deployment post-traumatic stress symptoms (Erbes et al., 2008). This process of selective retention can continue as a cycle to make service members more homogenous in motivations and political ideology (Griffith, 2011). It is vital the military sustains and protects democratic values, and their values and practice must support the democratic values and practices they protect for all Americans (B. Burk, personal communication, March 14, 2020).

Job Satisfaction

Job satisfaction is the variable that is best at predicting turnover rates and is built from many of the variables discussed above (Price, 2001). In a review of the last one hundred years of turnover research, Hom et al. (2017) noted the centrality of job satisfaction in most models. While studies for U.S. Army PA retention are limited, more work has been done on U.S. military physician job satisfaction.

Marble et al. (2020) found that measures to decrease time away from patient care, increase length of duty locations (if desired), and increase recognition of excellent work were factors needed to improve job satisfaction. In a look at all U.S. military physicians, Oravec et al. (2013) noted that humanitarian missions increased job satisfaction and intent to remain on active-duty, although the effects were larger among Air Force physicians than Army physicians, and the study respondents were family practitioners and pediatricians. Another study found that the only factor that increased military physician job satisfaction was mentorship, although the study's participants were mostly only military physicians in academia (Song et al., 2020).

Wojcik et al. (2020) surveyed all U.S. Army physicians and found that satisfaction increased with rank and working in a hospital (versus a clinic), decreased after they had completed their residency, and was lowest among those in mission-critical surgical specialties. Mission-critical surgical specialties may have decreased satisfaction due to their increased number of deployments and increased civilian opportunities, due to increased civilian demand for these specialties. Rank may appear to increase job satisfaction, due to increased pay, individuals of higher rank tending to be closer to retirement, increased power with rank, different job opportunities, and because those who were dissatisfied left before reaching advanced ranks. Obtaining a medical residency is a crucial factor attracting medical students into military medicine, and the completion of the residency removes this incentive. Similarly, PAs lose their incentive to continue in the military to attend PA school after they complete it.

Chapter Summary

The understanding of the theoretical retention models and previous military retention studies discussed in this chapter helps to better understand U.S. Army PA retention. Earlier retention studies tended to be variable based, with some being comprehensive (Meyer &

Parfyonova, 2010), such as Price's Causal Model of Turnover (2001), with a broad array of variables. Other early retention studies were not comprehensive, and more focused variable-based models, such as Moskos Institutional-Occupational (I-O) model, concentrated on understanding an individual's commitment to the institution and to the occupation (Moskos et al., 2000). This positivist approach assumed retention could be predicted by understanding the variables (Xu & Payne, 2018). Price (2001) believed that, through combining knowledge from previous retention studies, a predictive variable-based model could be constructed, although they failed to significantly predict retention.

Later studies tended to be more person-centered, looking at retention processes individuals follow (Li et al., 2016). For example, the unfolding model considered how significant events called shocks were reconciled with a previously formulated retention plan (Kulik et al., 2012). Job embeddedness theory categorized people's commitments into affective commitments (when people's values align with the company), exchange bound commitments (arising from receiving something of value), and weak commitments (lacking either of the other commitments) (Xu & Payne, 2018). PWST combines job embeddedness and the unfolding model to group employees into commitment profiles of enthusiastic stayers, reluctant stayers, reluctant leavers, and enthusiastic leavers, each with different likelihoods of being retained (Hom et al., 2012). Just as the Causal Model was built upon previous variable-centered retention models (Price, 2001), PWST incorporated previous content and process retention models to provide the how and the why of quitting (Maertz, 2012).

Models often focus rationally and systemically on the processes employees use to leave their organization (Maertz, 2012). This focus tends to lead researchers to miss difficult-to-quantify behaviors such as impulses (Steel, 2002), as when a satisfied employee spontaneously

leaves when given another job offer (Holt et al., 2007). Research so far has had limited ability to predict a significant percentage of turnover. A portion of this failure may be the difficulty in accounting for difficult-to-measure behaviors such as impulses (Maertz, 2012). Another factor may be related to limitations with the variables that have already been explored (Hom et al., 2017). There may be significant variables that researchers have not uncovered, the current variables may have not been measured correctly, and/or their relationships may be incorrect. Unfortunately, models may not be able to predict a phenomenon as complicated as retention (Maertz, 2012).

A publication bias favoring U.S. Army Physician retention issues over PA retention issues exists, as studies exploring the military physician shortage is much more published (U.S. Government Accountability Office, 2020). For a study to better understand the current retention motivations for a U.S. Army PA, a study should be recent and look at the unique needs of PAs. A gap in the literature exists, as only a few published papers discuss U.S. Army PAs, only two discuss their retention issues, and none have generated knowledge based on quantitative analysis of this population. The lack of studies on U.S. Army PAs, the variation of conclusions drawn from various U.S. Army medical retention studies, the uniqueness of U.S. Army PAs, and the lack of predictability from retention models necessitates the need for a study to be completed on U.S. Army PAs.

This second chapter provided an overview on retention theories, theories relevant to this study, difficulty with application of these theories and an exploration how several retention variables affect U.S. Army PA retention. The next chapter will cover the methodology used in this study to understand U.S. Army PA retention.

Chapter 3: Research Methodology

This chapter will cover the methodology used to address the problem of U.S. Army active-duty PA retention. The first arm of the study used a regression analysis methodology to seek to uncover the factors associated with the intent of active-duty U.S. Army PAs to stay for at least 20 years. The dependent variable (DV) was the intent to stay for at least 20 years. The independent variables (IVs) were the questions from the study that predicted the intent to stay for at least 20 years. The second arm of the study used LCA methodology to develop subgroups of active-duty PAs based on their retention needs and attempted to explain these subgroups using the PWST. Results from two arms were both used when factors associated with the intent to stay were used to predict the subgroups created by LCA. This chapter has been divided into participant selection, the survey instrument, data collection, data analysis, interpretation of results, limitations, and ethical considerations.

Purpose and Research Questions

The purpose of this quantitative, non-experimental, cross-sectional study was to provide recommendations for improving U.S. Army active-duty PA retention while improving theoretical employee retention understanding. This study sought to answer the following research questions using the following hypotheses:

RQ1. What factors are associated with U.S. Army active-duty PA intent to stay for at least 20 years of service?

The initial research question represents the traditional population-based retention analysis.

RQ2. What are the different subgroups of Army active-duty PA retention?

The second research question seeks to establish what can be learned from segmenting the populations into subgroups using LCA.

RQ3. Are there similarities between the subgroups from LCA and the subgroups (enthusiastic leavers, reluctant stayers, reluctant leavers, and enthusiastic stayers) of the PWST?

(H₀) Profiles of U.S. Army active-duty PA retention are not associated with PWST.

(H₁) Profiles of U.S. Army active-duty PA retention are associated with PWST.

The third research question seeks to understand if PWST helps explain the subgroups created by LCA, and how this study can further the understanding of PWST.

RQ4. Can factors associated with the intent to stay for 20 years of service predict the subgroups created by LCA?

(H₀) Factors associated with the intent to stay for 20 years of service cannot predict the subgroups created by LCA.

(H₁) Factors associated with the intent to stay for 20 years of service can predict the subgroups created by LCA.

The final research question attempts to predict the classes from research question two with factors found relevant to the intent to stay for 20 years from research question one.

Research Design

This study utilized a quantitative, non-experimental, cross-sectional survey design to explore U.S. Army active-duty PA retention.

Population and Sample

A link to an online survey was given to all (approximately 6,000) active-duty Medical Service Corps and Specialist Corps officers (the Specialist Corps includes all 864 active-duty PAs) through their official U.S. Army email (J. Kocher, personal communication, April 14,

2021). As all active-duty PAs were sent an email with the link to this survey, the entire population of active-duty PAs were invited to participate. The survey was open for 2 months in the fall of 2020 and conducted on milSurvey, the official military survey software platform. Specialist Corps leaders sent out two emails reminding Specialist Corps officers of the survey and encouraging their participation.

Survey Instrument

Initially a pilot survey based on previous retention studies and my personal expertise of PA retention needs was conducted. A convenience sample of 20 current and former active-duty PAs known to me completed this online survey. Coincidentally, following the completion of this pilot study, the Statistical Analysis Cell at the U.S. Army Medical Center of Excellence created a retention survey based on questions used in a recent survey of U.S. Army physicians (Wojcik et al., 2020). The survey questions were modified using expert knowledge from U.S. Army Specialist Corps leaders (including PAs) to be more relevant to the Specialist Corps. The results from that survey were the most recent and most comprehensive retention study that included U.S. Army active-duty PAs.

Those surveyed were notified in advance that their participation was voluntary, results were anonymous, they could skip any answer, and there would be no retribution for any answers. The survey consisted of 70 questions, mostly on a 5-point Likert scale, while 10 were short answers and four were “yes or “no.” Fourteen of the questions addressed the likelihood to stay on active-duty, based on various current conditions, with answer choices *extremely likely*, *likely*, *neither likely nor unlikely*, *unlikely*, *extremely unlikely*, or *N/A*. One example of these 14 questions was: “How likely am I to stay given the implementation of the Army Combat Fitness Test (ACFT)?”

Twenty-one of the questions addressed the effect of work environment on retention, with answer choices *strongly agree*, *agree*, *neither agree nor disagree*, *disagree*, *strongly disagree*, or *N/A*. One example of these 21 questions was: “I have the materials and equipment I need to do my job”.

Next, the respondents selected as many of the 14 factors given as they believed would influence them to serve beyond their obligation. They were also asked to list the factors most important to them, and were given the option to explain if they selected *other* factors. They rated their overall job satisfaction as either *extremely satisfied*, *satisfied*, *neither satisfied nor unsatisfied*, *unsatisfied*, *extremely unsatisfied* or *N/A*. This was followed by asking them to rate their likelihood to stay for 20 years as *extremely likely*, *likely*, *neither likely nor unlikely*, *extremely unlikely*, or *N/A*. This same scale was used to rank their likelihood to join the reserves after active-duty. Those who had decided to leave were asked to rank the importance of five provided factors on their decision, with the option to add a short answer.

The demographic section consisted of 20 questions covering length of service, any prior military service before their current job, education level, gender, age, rank, corps, occupation, deployment length, and current type of duty location. The survey ended by asking six short-answer questions covering other factors relevant to retention decisions, three things Army medicine is doing well, three things Army Medicine could improve upon, and anything else they wished to tell senior leaders. The survey recorded start time, end time, and the page respondents stopped on. The results showed that all respondents completed the survey through page 12, the last page of the survey. See Appendix F for the survey questions.

Data Collection

Data collection was conducted by the Statistical Analysis Cell at the U.S. Army Medical Center of Excellence, who created and sent out the questionnaire through milSurvey, collected the data after the respondents submitted their answers electronically to the milSurvey questions, and exported the results into Excel. Upon completion of data collection, these results were sent to the leader of Specialist Corps. After the leader of the Specialist Corps received clearance to release the data from a Freedom of Information Act request completed by me for this dissertation, I received the data encrypted via official U.S. Army email on April 9, 2021. Data consisted of 2,592 records of Medical Service and Specialist Corps officers. PAs represented 283 of the records, or 10.9% of the total responses. As all 864 active-duty PAs (J. Kocher, personal communication, April 14, 2021) were given the survey, their response rate was 33.6%.

Reliability and Validity

The validity of the survey was supported by its previous use in another study, questions that aligned with many other retention studies, and its adaptation to U.S. Army active-duty PAs by senior Army PA leaders. While controversy exists around whether parametric tests can be run on Likert style data, Norman (2010) asserts it is acceptable, as parametric tests are robust even when assumptions are violated. When the sample sizes are greater than 72, the results of parametric and nonparametric tests of Likert style data were shown to arrive to the same conclusion (Mircioiu & Atkinson, 2017).

The reliability of individual responses was analyzed using Cronbach's alpha with a target of >0.7 (Streiner, 2003). Results were considered significant when p was <0.05 . The reliability of the regression analysis was analyzed by G*Power. The lowest r^2 of the only studies on PWST that reported it were 0.155 and 0.074 (Li et al., 2016), while the Causal Model had a r^2 of 0.18

(Price, 2001). G*Power 3.1.9.4 calculates an effect size f^2 (for r^2 of 0.155, 0.074 and 0.18) of 0.183, 0.135 and 0.21. Assuming the smallest effect size f^2 of these: 0.135, with an alpha error probability of 0.05, and providing for more predictors than expected at 13 requires a sample of ninety-nine to reach over 0.95 power with two-tailed multiple regression. The effect size f^2 of 0.135 represents slightly less than a medium effect per Cohen (1992). With a sample of 283 in this study, the size is estimated to be large enough to prevent type II errors over 95% of the time, assuming this medium effect size.

Next, the reliability of the LCA was evaluated using literature providing LCA reliability recommendations. The actual sample size of the study is 283, which is around the 100-300 or more cases desirable for LCA (McBride, 2011; Nylund-Gibson & Choi, 2018). LCA requires at least five respondents per independent variable for each subgroup, 10-20 respondents for each variable, and at least 30 respondents per subgroup (Garver et al., 2008; McBride, 2011). These guidelines of reliability were considered when determining the number of indicator variables and the number of subgroups, as discussed in the LCA data analysis below.

Data Analysis

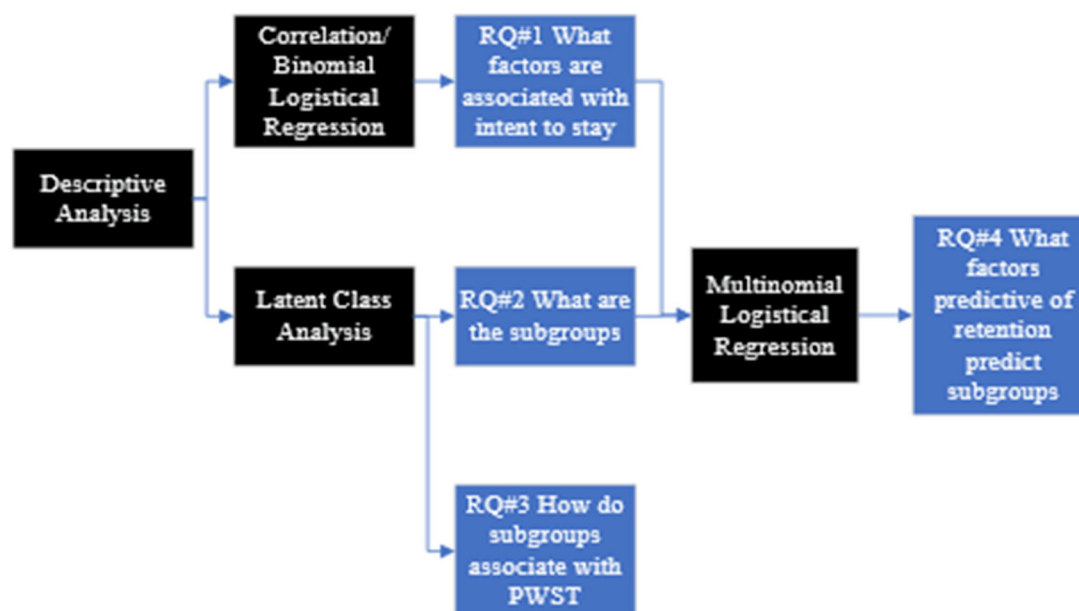
For an explanation of the relationship between the two arms of the study, the analysis, and the research questions, see Figure 6.

Non-PA respondents' data was excluded, identifying information removed, and the remaining data analyzed using descriptive statistics for an overview of the data. For all Likert style questions, five was coded as the most positive response, four for the next most positive response, three for neutral, two for the second most negative response, and one for the most negative response. N/A was coded as missing. Each of the 14 choices for "what would influence you to stay beyond your Active-Duty Service Obligation?" were each coded as a separate

number from one to 14. Frequency charts then compared responses to “Have you decided to depart the military prior to 20 years of service?” to responses to the other questions in the survey. The answer “yes” represented intent to leave while “no” represented intent to stay.

Figure 6

Data Analysis Roadmap



Note. RQ = Research Question. Relationship between research questions and statistical analysis are depicted. Black boxes depict statistical methods utilized. Blue boxes depict the study’s research questions.

Binomial Logistical Regression

Most retention studies use intent to stay, or leave, rather than actual turnover due to the ease of measurement and its significant predictive value (Winters, 2019). The strength of factors associated with intent to stay were described using binomial logistical regression. Binomial logistical regression determines the odds ratio a single binary variable is predicted by one or more other variables (Chatterjee & Simonoff, 2012). Sometimes binomial logistical regression is

referred to as logistical regression (Laerd Statistics, n.d.). However, the longer name of the test will be used for clarity due to the use of multinomial logistical regression later in the analysis.

This test assumes that there are no outliers, the data sets are independent, and the IVs are not significantly related to each other (Laerd Statistics, n.d.). Outliers can be identified and eliminated prior to analysis. The independence of the data is supported by it being a single data point in time as a cross-sectional survey. Price's Causal Model of Turnover delineates the relationships of the variables in the survey and serves as a guide to help ensure the IVs are not significantly related to each other.

Research question one was "What factors are associated with U.S. Army active-duty PAs intent to stay for at least 20 years of service?" Probability of answering no to "Have you decided to depart the military prior to 20 years of service" was the dependent variable for the first regression analysis. All 18 demographic questions, the 19 questions about current work environment, the 13 questions about changes in the U.S. Army that affect retention, the 21 questions about the work environment, and the five possible selections of the 14 choices for "what would influence you to stay beyond your active-duty service obligation" were the independent variables. Binomial logistical regression was run using IBM SPSS software version 27 to determine the odds ratios of variables able to predict the decision to stay for 20 years of service.

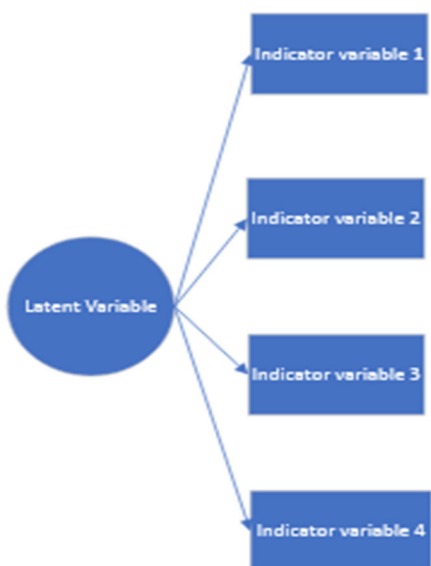
Latent Class Analysis

While LCA has been shown to be an especially useful tool, it is not always considered as an alternative to more traditional analysis (Hagenaars & McCutcheon, 2002). LCA is a form of mixture modeling used when the outcomes are categorical (Schumacker & Marcoulides, 2001). LCA is like factor analysis, as both use a latent variable to account for the relationship between

outcomes (Schumacker & Marcoulides, 2001). However, LCA is a person-centered classification model rather than a continuous construct model from items as in factor analysis (Li, 2017).

Most data analysis assumes all differences in the population are a result of the variables; however, there is unobserved heterogeneity, and LCA studies this heterogeneity (Hagenaars & McCutcheon, 2002). LCA allows analysis modeling when parameters vary by unobserved subgroups created by a latent variable that is not directly measurable (Vermunt & Magidson, 2004). LCA creates unseen subgroups from differences in response patterns to the indicator variables (Li, 2017). Each subgroup is unique compared to the other subgroups but individuals within each subgroup are similar (Bray, 2016). LCA has the advantages of allowing for covariates, not being limited to continuous dependent variables and has lower misclassification rates as it does not assume equal variance or local independence (Magidson & Vermunt, 2002).

Limitations of LCA include trouble accurately separating out subgroups when there is a large amount of variation within a subgroup creating problems with convergence and may result in multiple maxima (Schumacker & Marcoulides, 2001). Multiple maxima occurs when the analysis returns multiple rather than a single optimal fitting model (Chor et al., 2000). Increasing the random starts to see if the loglikelihood increases is recommended when there are concerns for multiple maxima (Schumacker & Marcoulides, 2001). Other limitations of LCA include selecting the wrong indicator variables, errors with assigning members to latent classes, and difficulty in selecting the number of classes (Clark & Muthen, 2004). These problems may be part of the reason LCA is sometimes unable to provide meaningful modeling to researchers (Achterhof et al., 2019). See Figure 7 for a depiction of the relationship between indicator variables, the latent variable, and latent classes.

Figure 7*Latent Class Analysis Graphical Representation*

Note. Adapted from Li (2017). The latent variable explains the association between the indicator variables and makes them independent from each other. Latent classes are created based on the probability of an individual in a group would respond to each indicator variable.

LCA was used to address the second and third research questions. Research question number two asked to identify the subgroups of active-duty PAs created by LCA. Research question number three are their similarities between these subgroups and the PWST. Mplus version 8.7 (Muthén, & Muthén, 2017) was used for LCA as it is the most used statistical software for LCA and can work with complex survey design and modeling with issues (Weller et al., 2020). Mplus has an easy-to-use interface, works with a wide variety of data types, offers graphical result displays, and is supported by extensive user guides, example analysis, videos, and a forum monitored by a development team who are widely published and frequently cited (Mplus, n.d.).

Selecting the wrong indicator variables is an important limitation of LCA. Due to the high number of questions in the survey (70), the number of indicator variables formed by the question needed to be limited. This limitation is based on the sample size and number of respondents within each subgroup (Garver et al., 2008). Theory should guide the selection of indicator variables in both exploratory and confirmatory LCA (Weller et al., 2020).

The conceptual model formed the basis for indicator variable selection using primary variables selected from the left-hand side of the conceptual model seen on Figure 3. The coding of Likert scale questions utilized the method described in the above regression analysis. The first indicator variable selected, turnover, was represented by “Have you decided to depart the military once your commitments are complete but before you reach 20 years?” The second indicator variable, pay, was represented with the question “How likely is your intent to stay given current financial compensation compared to civilian peers with similar experience represented pay?” The third, stress, was represented by “I have the administrative support to do my job.” The fourth, autonomy, by “At work I have the ability to do what I do best.” The fifth, justice, by “My unit does a good job of formally recognizing excellent work via awards or certificates.” The sixth, social support, by “My unit leaders care about me as a person.” The seventh, involvement, by “The mission and vision of Army Medicine make my job feel important.” The eighth, promotion, by “I have been given adequate opportunities to grow as a leader.” The ninth, opportunity, by “I believe my career goals can be achieved within the Army.”

Another limitation of LCA is the difficulty in determining the number of subgroups. There are multiple methods to determine the appropriate number of subgroups for LCA that can be used in a complimentary manner (Garver et al., 2008). These include goodness of fit measures, traditional regression model assessment approaches, misclassification error,

theoretical knowledge, and researcher judgement. This study used the stepwise approach recommended by Asparouhov and Muthen (2012) outlined in the Mplus Web Notes. It first identifies best likelihood, then assesses goodness of fit, using the Lo Mendell Rubin tests. The Bayes Information Criteria (BIC) and Size Adjusted BIC were also used (Nylund et al., 2007). Limiting the number of segments is recommended for practicality of analysis, and to avoid validity errors when the number of individuals per subgroup per IV decreases. While a larger number of individuals per subgroups decreases the impact of this error, this error is always a consideration as the class assignment is based on probabilities from the responses of the indicator variables (Weller et al., 2020).

After LCA segmentation, an analysis of PWST's ability to label the LCA subgroups determined the extent this theory provided insight to the study. Naming the subgroups helps refer to them and communicate the differences between each group (C. Niu, personal communication, July 24, 2022). When Li et al. (2016) determined the PWST subgroups, respondents who wanted to leave were asked if they could leave (distinguishing enthusiastic leavers) or if they could not leave (distinguishing reluctant stayers). Those who did not want to leave were asked if they could stay (distinguishing enthusiastic stayers) or if they could not stay (distinguishing reluctant leavers).

While Li et al. (2016) was performing confirmatory LCA as the goal of their study was to support PWST as a valid theory, this study performed exploratory LCA as the primary goal was to provide practical recommendations and add to theoretical knowledge. The labeling of subgroups in this study aimed primarily to characterize and communicate the nature of each class. While the process may have provided support for the PWST, PWST was considered while labeling primarily due to its potential to help label the results. When naming the latent classes, a

“naming fallacy” should be considered, as a source of error may occur as the subgroup class label may not always accurately communicate the class’s characteristics (Weller et al., 2020).

Multinomial Logistical Regression

Research question number one discovered what factors were associated with U.S. Army active-duty PAs intent to stay for 20 years. Research question number two divided the population of Army active-duty PAs into subgroups. Research question number four asked if the factors identified in research question number one could predict the subgroups from research question number two.

Research question number one used *binomial* logistical regression as the dependent variable was binary, did PAs “intend or not intend to serve 20 or more years?” However, to answer research question four, *multinomial* logistical regression was used as the dependent variable consisted of multiple classes. Rather than a odds ratio for a binary outcome as in binomial logistical regression, multinomial logistical regression uses a maximum likelihood estimation to determine the relative risk of categorical membership in a dependent variable with more than two categories (Hilbe, 2009).

The output file of Mplus provided the classes assigned to each respondent. A new variable category latent class was added to the SPSS data file. Class data from Mplus was imported into SPSS to provide the latent class assigned to each respondent for this new latent class variable. Multinomial logistical regression was run under IBM SPSS software version 27 using the latent class variable as the dependent variable and those variables found to predict the intent to stay for 20 or more years identified in research question number one were the independent variables.

Considering the Different Analytical Techniques

The population-based results were compared to subgroup analysis to determine how the different statistical techniques could provide theoretical and practical recommendations when considered independently and together. The population-based regression analysis identified variables linked to turnover of the population. While LCA compared variables deemed important to retention among subgroups. Using both methods together could be compared to how a microbiologist considers both an entire cell under lower magnification and the substructures of the cell under higher magnification, using both to gain a fuller understanding of the cell.

Tables were created from the analyses made throughout the data collection that most clearly and accurately represented the results. The resulting analysis provided insights from both the commonly used variable-centered regression analysis and the newer person-centered theoretical analysis to provide practical recommendations, assist in model refining, enable repeatability, and help inform future studies.

Research Ethics and Human Subject Protection

Prior to conducting the survey, Institutional Review Board (IRB) approval was completed by the Statistical Analysis Cell at the U.S. Army Medical Center of Excellence. Prior to my analysis of these results, the U.S. Army Medical Center of Excellence and the University of the Incarnate Word approved the study. The U.S. Army Medical Center of Excellence provided IRB approval, a non-research determination for this study on May 10, 2021. See Appendix A for this application and Appendix B for this approval. On November 30, 2021, the University of the Incarnate Word IRB determined that this study did not meet the regulatory definition of research with human subjects. See Appendix C for this application and Appendix D for this approval. The

U.S. Army Public Affairs Office approved the content of this paper for release on July 1, 2022.

See Appendix E for this approval.

The study used data from a recently completed survey. While the survey was anonymous, some respondents chose to provide contact information. This was removed upon receipt of the data. The raw data was stored in a password-protected Excel spreadsheet on a private computer. The computer and the Excel spreadsheet were only accessible by me. Each respondent was identified with a randomly generated number. However, because demographics information could be used to attempt to identify individuals, particularly at higher ranks that contain fewer personnel, no portion of the data was released by me, including during consultation with the dissertation committee, during any of the defenses, or in this written dissertation.

This survey could recommend changes that favor certain demographics over others. Population-based assessment of military retention surveys may contain this bias, even if unintentionally. This could occur if decisions are made based on majority findings. Findings varied significantly by demographic, and different demographics were not equally represented. The analysis of the subgroups created by LCA may have various levels of demographics of possible ethical concern. However, while gender was included, race, ethnicity and other demographics of possible ethical concern were not identified by the survey so this possibility could not be evaluated.

Researcher bias from my being a currently serving U.S. Army active-duty PA was partially limited through utilizing a secondary data set of survey results that were already completed. The questions for the survey were validated on a previously published retention study (Wojcik et al., 2020) and adapted from a committee of several senior PA leaders. Developing a methodology prior to analyzing the data that utilized methods like other previous studies also

helped minimize this bias. The quantitative post-positivist paradigm incorporated and considered all data. This helped avoid selection bias that results when needing to choose which results were pertinent. Review of this dissertation by the Army Public Affairs Office and the disclaimer at the beginning of the dissertation that this work was the views of the author and not official military policy also helped limit external pressure from my military background.

Chapter Summary

The purpose of this quantitative, non-experimental, cross-sectional study was to provide recommendations for improving U.S. Army active-duty PA retention while improving theoretical employee retention understanding. A link to a retention questionnaire based on a previous retention survey of U.S. Army Physicians was sent to all U.S. Army PAs in the fall of 2020. The methodology of this study conducted a regression analysis to determine which variables were linked to the intent of U.S. Army PAs to stay for 20 years of service. Then it performed LCA on the respondents to see what subgroups could be created. Next it compared the subgroups to subgroups predicted by PWST. Finally, it predicted the subgroups of LCA using the factors predictive of the intent to serve for at least 20 years. This third chapter covered the purpose of the study and research questions, research design, research ethics, purpose and scope, reliability and validity, the survey instrument, data collection, and limitations. The next chapter will provide the results of the study.

Chapter 4: Results

The purpose of this quantitative, non-experimental, cross-sectional study was to provide recommendations for improving U.S. Army active-duty PA retention while improving theoretical understanding of employee retention. A survey, available to all U.S. Army active-duty PAs, was analyzed using population and subgroup analysis guided by a conceptual framework created by two major retention theories. The conceptual framework was created to provide recommendations to improve retention strategies for active-duty PAs, guide the methodology and analysis of the study, and aid in improving theoretical understanding. This chapter will present the results of the data analysis, beginning with descriptive statistics, followed by weighted means of responses, chi-square, binomial logistical regression, latent class analysis, and multinomial logistical regression.

Surveys are the most used quantitative tool in social sciences, as they allow for a quick and broad sampling of a population to help prevent selection bias (Leavy, 2017), particularly helpful for a geographically dispersed population such as military servicemembers. A cross-sectional design has the advantage of allowing a single survey to capture the retention needs at one moment in time. While repeated measures are needed to track changes in retention needs, additional survey(s) would have been required in a population that already receives surveys frequently. Furthermore, examining the changing retention needs over time was not a goal of this study. Utilizing the common cross-sectional survey study design will aid in aligning it with theories created using this method to interpret, develop, and generalize the results.

Regression analysis is an established and commonly used statistical technique (Wojcik et al, 2020). However, LCA is a more recent innovation enabled by an increase in statistical understanding and computing power (Garver et al., 2008). LCA has previously studied

relationships between principals and teachers and retention (Urlick, 2016), truck driver retention (Garver et al., 2008), German student dropout rates (Mouton et al., 2020), mental health and American Black student dropout (Rose et al., 2017), new nurses' lifestyles and retention (Han, et al., 2019), and Army officers' commitment and retention (Xu & Payne, 2018). Job embeddedness theory was considered using LCA analysis by Xu & Payne (2018). PWST was explored with LCA by Liu & Raghuram (2021) and in this study.

It has been problematic to attempt to measure retention through a set of interrelated variables (Hom et al., 2012). Even with many competing retention theories and difficulty in the measurement of variables, LCA can still classify the sample into subgroups (Li, 2017) based on similarities within the group (Liu & Raghuram, 2021). These similarities are attributed to latent variables that are not directly measurable (Mouton et al., 2020). Segmenting the population into subgroups allows for an uncovering of information hidden by the different subgroups (Garver et al., 2008).

LCA overcomes the assumption that only one model is relevant for an entire population by assuming that the data contains different subgroups of unknown proportions mixed in a population (Garver, et al., 2008). PWST provides support for the need for subgroup-based analysis, as the different subgroups have been found to have distinct retention needs and retention rates, and benefit from separate retention strategies (Han et al., 2012). The motives for leaving and staying are different, which also supports the need for comprehensive retention plans addressing the needs of more than one group of employees (Cho et al., 2009). Additionally, unlike regression analysis, LCA does not assume that errors are normally distributed (Garver, et al., 2008).

Descriptive Statistics

Demographics

Of the 864 active-duty PAs (J. Kocher, personal communication, April 14, 2021), 283 responded for a response rate of 33%. The study had 22% ($n = 63$) female respondents, 73% ($n = 208$) male respondents, and 4% ($n = 12$) preferring not to identify gender respondents. The female percentage of all U.S. Army active-duty female PAs is 23.7% (C. Smith, personal communication, May 16, 2022). Most U.S. Army PAs start as First Lieutenants, with 6 months accelerated promotion to Captain due to the requirement of having at least a master's degree to be an Army PA. See Table 1 for demographics.

Cross-tabulation

Next, the demographics of respondents were compared to their likelihood of wanting to stay on active-duty for 20 or more years. The weighted mean of likelihood of staying by each demographic provided a simple measure of central tendency as was used in a similar study of U.S. Army physicians (Wojcik et al., 2020). The most positive response, “Extremely likely” or “have already served 20 years,” was given a score of 5, “Likely” a score of 4, “Neither likely nor unlikely” responses 3, “Unlikely” 2 and “Extremely Unlikely” 1. Males ($M = 3.97$) were more likely to want to serve at least 20 years than females ($M = 3.39$). As age increased, rank increased, or length of being enlisted prior to becoming a PA increased, the likelihood of wanting to serve 20 years on active-duty increased. The youngest age category, ≤ 29 years, were least likely to want to serve 20 years ($M = 1.78$), while the oldest category, ≥ 60 years, were the most likely ($M = 4.50$). Those with the lowest rank, First Lieutenants, were the least likely to

Table 1*Demographics of Survey Respondents*

Demographic	Total of Demographic <i>n</i> (column %)
Gender	283 (100%)
Female	63 (22.3%)
Male	208 (73.4%)
Prefer not to respond	12 (4.2%)
Age	283 (100%)
29 years or younger	9 (3.2%)
30-39 years old	134 (47.3%)
40-49 years old	97 (34.3%)
50-59 years old	34 (12.0%)
60 years or older	4 (1.4%)
Prefer not to answer	5 (1.8%)
Rank	283 (100%)
First Lieutenant	26 (9.2%)
Captain	125 (44.2%)
Major	82 (29.0%)
Lieutenant Colonel	30 (10.6%)
Colonel	10 (3.5%)
Prefer not to answer	10 (3.5%)
Years Enlisted prior to Commissioning	283 (100%)
None	78 (27.6%)
5 years or less	30 (10.6%)
6-10 years	94 (33.2%)
11-15 years	68 (24.0%)
16+ years	13 (4.6%)
Years Officer prior to Medical Commissioning	283 (100%)
None	223 (78.8%)
5 years or less	29 (10.2%)
6-10 years	27 (9.5%)
11-15 years	2 (0.7%)
16+ years	2 (0.7%)

want to serve 20 years ($M = 2.87$), while those with the highest rank, Colonels, were the most likely to want to serve 20 years ($M = 5.00$). Those with no enlisted years prior to commissioning were the least likely to want to stay 20 years ($M = 3.42$), while those with 16+ years were the most likely to want to stay 20 years ($M = 5.00$). See Table 2 for a comparison of demographics to likelihood of wanting to stay on active-duty for 20 years.

A similar table was then completed that considered perceptions about upcoming changes in the U.S. Army. Respondents were asked how likely upcoming changes in the U.S. Army would affect their intent to stay on active duty. New medical readiness measures ($M = 3.29$) had the highest perceived effect on intent to stay. These measures include an electronic portal to facilitate communication about medical readiness between a soldier's commander and medical providers. The second highest perceived effect on intent to stay was new requirements for individuals to take command ($M = 3.22$). These new requirements for commanders are that they must be able to pass the entire Army physical fitness test. Those with medical waivers restricting their performance on any section of the test are now ineligible to take command.

Of the upcoming changes, the possibility of limited promotions ($M = 1.82$) had the lowest effect on intent to stay. The second lowest effect on intent to stay was current financial incentives ($M = 2.46$). The most frequent N/A response on the upcoming changes was the new blended retirement system, with 101 (35.7%) selecting N/A. Many PAs had the option to opt out of the new blended retirement system and continue with the older retirement system. See Table 3 for the results of the frequency analysis on upcoming changes in the U.S. Army.

Table 2*Demographics Compared to Likelihood to Stay for at least 20 years*

Perceived Likelihood to Stay for at least 20 years									
	Total	Already served 20 years	Extremely Likely	Somewhat Likely	Neither Likely nor Unlikely	Somewhat Unlikely	Extremely Unlikely	N/A	Mean ^a
	<i>n</i> (column %)	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	
Total	283	61 (21.6)	75 (26.5)	51 (18.0)	23 (8.3)	18 (6.4)	43 (15.2)	18 (6.4)	3.89
Gender									
Female	63 (22.3)	11 (17.5)	10 (15.9)	16 (25.4)	4 (6.3)	6 (9.5)	14 (22.2)	2 (3.2)	3.39
Male	208 (66.7)	48 (23.1)	64 (30.8)	32 (15.4)	16 (7.3)	12 (5.8)	26 (12.5)	10 (4.8)	3.97
PNTA	12 (4.2)	2 (16.7)	1 (8.3)	3 (25.0)	3 (25.0)	0 (0.0)	3 (25.0)	0 (0.0)	3.25
Age									
≤29 years	9 (3.2)	0 (0.0)	1 (11.1)	1 (11.1)	1 (11.1)	2 (22.2)	3 (33.3)	1 (11.1)	1.78
30-39 years	134 (47.3)	7 (5.2)	35 (26.1)	36 (26.9)	11 (8.2)	12 (9.0)	31 (23.1)	2 (1.5)	3.48
40-49 years	97 (34.3)	34 (35.1)	35 (36.1)	8 (8.2)	9 (9.3)	4 (4.1)	4 (4.1)	3 (3.1)	4.43
50-59 years	34 (12.0)	19 (55.9)	3 (8.8)	3 (8.8)	2 (5.9)	0 (0.0)	2 (5.9)	5 (14.7)	4.48
≥60 years	4 (1.4)	1 (25.0)	1 (25.0)	2 (50.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4.50
PNTA	5 (1.8)	0 (0.0)	0 (0.0)	1 (20.0)	0 (0.0)	0 (0.0)	3 (60.0)	1 (20.0)	1.40
Rank									
1st Lt	26 (9.2)	1 (3.8)	6 (23.1)	3 (11.5)	2 (7.7)	2 (7.7)	9 (34.6)	3 (11.5)	2.87
Captain	125 (44.2)	12 (9.6)	35 (28.0)	30 (24.0)	11 (8.8)	11 (8.8)	24 (19.2)	2 (1.6)	3.53
Major	82 (29.0)	21 (25.6)	26 (31.7)	16 (19.5)	5 (6.1)	3 (3.7)	6 (7.3)	5 (6.1)	4.23
Lt. Colonel	30 (10.6)	18 (60.0)	5 (16.7)	1 (3.3)	3 (10.0)	1 (3.3)	1 (3.3)	1 (3.3)	4.52
Colonel	10 (3.5)	8 (80.0)	1 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (10.0)	5.00
PNTA	10 (3.5)	1 (10.0)	2 (20.0)	1 (10.0)	2 (20.0)	1 (10.0)	3 (30.0)	0 (0.0)	3.00
Years Enlisted prior to Commission									
None	78 (27.6)	9 (11.5)	16 (20.5)	16 (20.5)	11 (14.1)	6 (7.7)	16 (20.5)	5 (6.4)	3.42
≤5 years	30 (10.6)	2 (6.7)	7 (23.3)	7 (23.3)	4 (13.3)	4 (13.3)	5 (16.7)	1 (3.3)	3.38
6-10 years	94 (33.2)	24 (25.5)	27 (28.7)	18 (19.1)	6 (6.4)	4 (4.3)	13 (13.8)	2 (2.1)	3.98
11-15 years	68 (24.0)	16 (23.5)	22 (32.4)	10 (14.7)	2 (2.9)	4 (5.9)	9 (13.2)	5 (7.4)	4.33
16+ years	13 (4.6)	10 (76.9)	3 (23.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5.00

Note. *N* = 283. PTNA = Prefer not to answer. Lt = Lieutenant. Percentages may not total one hundred, due to rounding.

^aMean of Likert scale where 5 = extremely likely and I have already served 20 years; 4 = somewhat likely, 3 = neither likely nor likely, 2 = somewhat unlikely, 1 = extremely unlikely, N/A responses are excluded

The final frequency analysis looked at the extent to which respondents agreed with factors related to their current work environment. The respondents ranked knowing their job requirements while deployed ($M = 4.29$) with the highest mean of the current work environment variables. The second highest of the work environment variables was knowing their job expectations ($M = 4.19$). The third highest was confidence in their ability to perform while deployed ($M = 3.95$). These three variables were the only ones of the current work environment questions that asked for self-analysis of their knowledge, skills, and abilities.

The lowest mean of the current work environment variables was having enough administrative support to do their job ($M = 2.84$). This question considered personnel assistance (which might include medics, nurses, and nonclinical personnel), and having enough equipment to do the job as a separate question. The second lowest mean of the assessment of current work environment was the ability to influence next job ($M = 2.98$). These job changes generally occur every 2-3 years, are assigned with official military orders, and consider the needs of the Army and the wishes of the soldier. U.S. Army PAs are officers as well as clinicians so jobs may consist of a combination of clinical, leadership, and other responsibilities. The third lowest mean of the current work environment was the unit being good at recognition ($M = 3.00$). This could be any combination of official and unofficial recognition, with the awards sometimes being presented in front of others. See Table 4 for all the results of the current work environment questions.

Table 3*Intent to Stay, Given Upcoming U.S. Army Changes*

Issue	Perceived effect of upcoming change on intent to stay						
	Extremely Likely	Somewhat Likely	Neither Likely nor Unlikely	Somewhat Unlikely	Extremely Unlikely	N/A	Mean ^a
	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	
New medical readiness measures	29 (10.2)	69 (24.4)	118 (41.7)	23 (8.1)	30 (10.6)	14 (4.9)	3.29
New requirements for command	50 (17.7)	42 (14.8)	115 (40.6)	16 (5.7)	36 (12.7)	24 (8.5)	3.22
Opportunities for specialty training	36 (12.7)	82 (29.0)	83 (29.3)	26 (9.2)	37 (13.1)	19 (6.7)	3.20
New Army Combat Fitness Test	50 (17.7)	39 (13.8)	109 (38.5)	37 (13.1)	37 (13.1)	11 (3.9)	3.10
Current non-financial incentives	39 (13.8)	71 (25.1)	63 (22.3)	58 (20.5)	48 (17.0)	4 (1.4)	2.98
New Army Talent Alignment	18 (6.4)	40 (14.1)	102 (36)	51 (18.0)	47 (16.6)	25 (8.8)	2.73
Officers now assigned to MTOE	31 (11.0)	30 (10.6)	102 (36.0)	41 (14.5)	51 (18.0)	28 (9.9)	2.72
New blended retirement system	11 (3.9)	17 (6.0)	98 (34.6)	20 (7.1)	36 (12.7)	101 (35.7)	2.71
Defense Health Agency control	28 (9.9)	35 (12.4)	77 (27.2)	58 (20.5)	67 (23.7)	18 (6.4)	2.62
Possible cuts to Army Medicine	22 (7.8)	24 (8.5)	90 (31.8)	65 (23.0)	64 (22.6)	18 (6.4)	2.53
Current military activity pace	27 (9.5)	36 (12.7)	91 (32.2)	54 (19.1)	72 (25.4)	3 (1.1)	2.51
Financial incentives	29 (10.2)	39 (13.8)	49 (17.3)	79 (27.9)	84 (29.7)	3 (1.1)	2.46
If limited promotions	5 (1.8)	24 (8.5)	31 (11.0)	68 (24.0)	143 (50.5)	12 (4.2)	1.82

Note. *N* = 283. MTF = Military Treatment Facility MTOE = Modification Table of Organization NDAA = National Defense Authorization Act. Percentages may not total one hundred due to rounding.

^aMean is average of Likert scale where 5 = extremely likely, 4 = somewhat likely, 3 = neither likely nor unlikely, 2 = somewhat unlikely, 1 = extremely unlikely and N/A has been excluded.

Table 4*Current Work Environment*

Issue	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree	Mean ^a
	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	<i>n</i> (row %)	
Know job deployment requirements	141 (49.8)	108 (38.2)	14 (12)	16 (5.7)	4 (1.4)	4.29
Know work expectation	118 (41.7)	128 (45.2)	16 (5.7)	16 (5.7)	5 (1.8)	4.19
Confident can perform deployed	105 (37.1)	113 (39.9)	18 (6.4)	40 (14.1)	7 (2.5)	3.95
Proud of Army Medicine	88 (31.1)	118 (41.7)	46 (16.3)	19 (6.7)	12 (4.2)	3.89
Feel respected	69 (24.4)	144 (50.9)	39 (13.8)	21 (7.4)	10 (3.5)	3.85
Allowed to practice as clinician	71 (25.1)	106 (37.5)	64 (22.6)	32 (11.3)	10 (3.5)	3.69
Unit cares about me	58 (20.5)	121 (42.8)	61 (21.6)	29 (10.2)	14 (4.9)	3.64
Confident in leaders	57 (20.1)	117 (41.3)	69 (24.4)	20 (7.1)	20 (7.1)	3.60
Unit encourages development	56 (19.8)	96 (33.9)	75 (26.5)	38 (13.4)	18 (6.4)	3.47
Opportunity to grow as leader	48 (17.0)	109 (38.5)	62 (21.9)	49 (17.3)	15 (5.3)	3.45
Opportunity to do best at work	55 (19.4)	106 (37.5)	43 (15.2)	58 (20.5)	21 (7.4)	3.41
Allowed to stay current as a PA	51 (18.0)	105 (37.1)	48 (17.0)	60 (21.2)	19 (6.7)	3.39
Have enough equipment to do job	42 (14.8)	118 (41.7)	33 (11.7)	65 (23.0)	25 (8.8)	3.31
Mission makes job important	35 (12.4)	109 (38.5)	67 (23.7)	46 (16.3)	26 (9.2)	3.29
Recognized for good work	53 (18.7)	92 (32.5)	49 (17.3)	61 (21.6)	28 (9.9)	3.29
Supervisor communicates my progress	46 (16.3)	96 (33.9)	48 (17.0)	63 (22.3)	30 (10.6)	3.21
Goals can be achieved in Army	38 (13.4)	90 (31.8)	51 (18.0)	58 (20.5)	46 (16.3)	3.06
Unit good at recognition	30 (10.6)	71 (25.1)	79 (27.9)	74 (26.1)	29 (10.2)	3.00
Able to influence next job	35 (12.4)	90 (31.8)	46 (16.3)	58 (20.5)	54 (19.1)	2.98
Have enough admin support to do job	29 (10.2)	87 (30.7)	31 (11.0)	82 (29.0)	54 (19.1)	2.84

Note. Percentages may not total one hundred due to rounding. *N* = 283

^a Mean is average of Likert scale where 5 = Strongly Agree, 4 = Agree, 3 = Neither Agree nor Disagree, 2 = Disagree, 1 = Strongly Disagree

Reliability of the Survey Instrument

Cronbach's Alpha is the most frequent measurement of the internal consistency reliability coefficients (Cronk, 2018). The overall Cronbach's Alpha for the survey was .908, which indicated a high degree of internal reliability, as the reliability goal of an instrument is to be greater than .70 (Cronk, 2018). Only one question, "Which initiative should have top priority?" would raise the reliability if removed. Removing this question would have raised Cronbach's Alpha to .921. The poor reliability of this question was not as consequential, as this question was not found to be significant during any of the inferential analysis.

Statistical Tests

Chi-square Test of Independence

An important first step when considering inferential tests is to determine if the data is parametric or not, as to run parametric tests, the data must be normally distributed (Ha & Ha, 2012). The Kolmogorov-Smirnov and Shapiro-Wilks tests were utilized to check for normal distribution of the data. The p-value of the Kolmogorov-Smirnov and Shapiro-Wilk tests for every question in the survey was < 0.001 , so the null hypothesis that the data was normally distributed was rejected (Mohd Razali & Yap, 2011). As the data was not normally distributed, nonparametric testing was used throughout the inferential analysis (Cronk, 2018). The chi-square test of independence was the first inferential test selected, as it can be run on nonparametric data (Yeager, n.d.).

The chi-square of independence was used during two analyses in this dissertation. For the first, it considered if the sample demographics were statistically like the known population demographics. The second use involved the first research question, which looked at what factors are associated with U.S. Army active-duty PA's intent to stay for 20 years. The chi-square test of

independence for this second use found which variables were significantly associated with the respondent's intent to stay for at least 20 years.

The equation for the chi-square test of independence is:

$$\chi^2 = \sum (O_i - E_i)^2 / E_i$$

where O is the observed value and E is the expected value (Raveendran, n.d.). Chi-square uses rankings, so it is not sensitive to the effects of outliers (Howell, 2017). Mahalanobis Distance detects outliers (Gyebnar et al., 2019). Two outliers (p values < 0.001) were found using the Mahalanobis Distance test. These two respondents were removed and excluded from all the inferential statistics. This left 281 cases for inferential analysis.

Assumptions. The assumptions for the binomial logistic regression test (Yeager, n.d.) were addressed as follows:

1. Two categorical variables.

The categorical variable intent to stay for at least 20 years was compared individually to other variables. All considered variables consisted of categorical variables, either Likert style or mutually exclusive and exhaustive binary variables.

2. Two or more categories (groups) for each variable.

Each variable consisted of 2-6 categories per variable.

3. Independence of observations.

Each variable was mutually exhaustive and not "paired" in any way.

4. Relatively large sample size.

The sample size of 281 was large enough for the expected frequencies of each possible variable were at least one, and at least 5 for the majority (80%) of the cells.

Results. The sample demographics were compared to the population demographics using the chi-square test of independence. Population data was obtained by a PA representative of U.S. Army Human Resource Command after permission for release was received by a Human Resource Command authority (C. Smith, personal communication, May 16, 2022). See Table 5 for the results of the first use of the chi-square test of independence.

Every Likert style question was compared to the intent to stay on active-duty for 20 or more years. Eighteen of the 49 questions compared were significant. Table 6 lists the 18 significant questions for the second use of the chi-square test of independence.

Binomial Logistic Regression

Binomial logistic regression finds predictive relationships between variables (Cronk, 2018). Binomial logistic regression predicts the dependent variable (DV) from each independent variable (IV) by fitting a model with a likelihood ratio of a DV given each IV (Hosmer et al., 2013). The equation for binomial logistic regression can be represented as:

$$y = 1/(1+e^{-(a+b_1x_1+b_2x_2+b_3x_3+\dots)})$$

where y is the response variable, x is the predictor variable and a and b are numeric constant coefficients (Tutorials Point, n.d.).

Assumptions. I addressed the assumptions for the binomial logistic regression test (Laerd Statistics, n.d.):

1. DV must be dichotomous.

The DV of the survey = “Have you decided to depart the military before 20 or more years of service?” is dichotomous as the answers were either “yes” or “no”.

2. One or more IVs are continuous, ordinal, or nominal.

The IVs of the selected questions in the survey are ordinal, consisting of Likert style data.

Table 5*Demographics of Survey Respondents Compared to Population*

Demographic	Total of Demographic of Respondents <i>n</i> (col %)	Total of Demographic of Population	χ^2
Gender	283 (100%)	864 (100%)	.91
Female	63 (22.3%)	205 (23.7%)	
Male	208 (73.4%)	659 (76.3%)	
Prefer not to respond	12 (4.2%)	0 (0%)	
Rank	283 (100%)		<.001
First Lieutenant	26 (9.2%)	132 (15.3%)	
Captain	125 (44.2%)	446 (51.6%)	
Major	82 (29.0%)	219 (25.3%)	
Lieutenant Colonel	30 (10.6%)	48 (5.5%)	
Colonel	10 (3.5%)	19 (2.2%)	
Prefer not to answer	10 (3.5%)	0 (0%)	
Age	283 (100%)		.22
29 years or younger	9 (3.2%)	34 (4.0%)	
30-39 years old	134 (47.3%)	448 (52.8%)	
40-49 years old	97 (34.3%)	309 (36.4%)	
50-59 years old	34 (12.0%)	54 (6.4%)	
60 years or older	4 (1.4%)	4 (0.5%)	
Prefer not to answer	5 (1.8%)	0 (0%)	
Years Enlisted prior to Commissioning	283 (100%)		
None	78 (27.6%)		
5 years or less	30 (10.6%)		
6-10 years	94 (33.2%)		
11-15 years	68 (24.0%)		
16+ years	13 (4.6%)		
Years Officer prior to Medical Commissioning	283 (100%)		
None	223 (78.8%)		
5 years or less	29 (10.2%)		
6-10 years	27 (9.5%)		
11-15 years	2 (0.7%)		
16+ years	2 (0.7%)		

Note. $N = 283$. Chi-square compared sample demographics to population when population demographics known. Years enlisted prior to commissioning and years officers prior to commissioning in population is unknown.

Table 6*Questions Significant When Compared to Intent to Stay for 20 Years*

Issue	Intent to stay on active-duty for 20 or more years	
	χ^2	p (2-tailed)
Likelihood to recommend Army Medicine	43.4	<0.001
Given DHA control of Army Medicine	35.5	<0.001
Job satisfaction	24.5	<0.002
Belief career goals are achievable	24.5	<0.001
Job makes me feel important	19.9	<0.001
Being proud of Army Medicine	19.8	<0.001
Given changes to duty assignment process	18.8	<0.001
Belief unit good at recognition	16.0	0.003
Given current OPTEMPO	15.6	0.004
Length as an Officer prior to becoming a PA	13.5	0.02
Belief leaders encourage development	13.5	0.009
Belief adequate admin support	12.9	0.01
Belief in ability to influence next job	12.4	0.02
Knowing what is expected at work	12.1	0.02
Given nonfinancial compensation	11.3	0.02
Given Blended Retirement system	10.9	0.03
Belief in having adequate materials	9.8	0.04
Gender	4.9	0.03

Note. $N = 283$. OPTEMPO = activity level of unit. Intent to stay for 20 or more years was analyzed for significance to all other variables in the study with the above variables being found to be significant.

3. Independence of observations.

The survey has independence of observations as a cross-sectional survey representing a single snapshot in time with each respondent being a single unique observation.

4. DV choices should be mutually exclusive and exhaustive.

The DV in the survey is mutually exclusive and exhaustive with answers being “yes” or “no” on likelihood to stay for 20 years or more.

5. No multicollinearity.

Multicollinearity is a linear relationship between two variables or one variable and a linear combination of other variables and may cause problems with the reliability of linear regression models (Alin, 2010). Variance inflation factors < 10 is considered to not have consequential multicollinearity (O’Brien, 2007). Variance inflation factors of variables in the survey ranged from 1.3-4.5, indicating a lack of consequential multicollinearity.

6. Linear relationship between IVs and the logit transformation of the DV.

Logits are a transformation of the predicted s-shaped probability curves to linearize it (Crowson, 2021). The Box-Tidwell transformation uses the product of the natural log of a variable multiplied by the variable (Crowson, 2021). I then compared the product by binomial logistic regression to ensure each transformed variable was not significant. Transformed variables for all variables found significant initially during testing were created. Results for all three variables were not significant ($p > 0.05$) for each variable, so a linear relationship exists between each IV and the logic transformation of the DV (Crowson, 2021).

The Hosmer-Lemeshow test is a goodness-of-fit test which checks to see if a linear relationship exists between the entire model of the IVs and the logit transformation of the DV (Archer & Lemeshow, 2006). The Hosmer-Lemeshow test for this survey was nonsignificant indicating the entire model meets this assumption. There is a linear relationship in the model of all the IVs and the logit transformation of the DV.

7. No outliers.

Mahalanobis Distance detects outliers (Gyebnar et al., 2019). I found two outliers (p values < 0.001) using the Mahalanobis Distance test. These two respondents were removed and excluded from all the inferential statistics. This left 281 cases for inferential analysis.

Results. Using the method described by Arifin (2016), every Likert style survey question was considered as an IV and individually compared to the DV intent to serve on active-duty for 20 or more years using logistic regression. Fifteen of the 44 DVs were not significantly predictive of the IV with a p -value < 0.25 and were removed from consideration for the binomial logistic regression. The remaining 28 variables were analyzed through forward and backward likelihood ratios (LRs). Twenty-five variables were not retained through both the forward and the backward LRs tests and were removed. This left three variables that were then considered for multicollinearity. The coefficients, standard errors and confidence intervals were small in absolute value, suggesting they did not have significant multicollinearity (Montgomery et al., 2012). Variance inflation factors of the three remaining variables ranged from 1.07-1.25. Variance inflation factors < 10 are considered to not have consequential multicollinearity (O'Brien, 2007). See Table 7 for the results of the multicollinearity assessment.

Table 7*Multicollinearity Assessment*

	<i>B</i>	<i>SE</i>	<i>p</i>	95% C.I. EXP(B)		VIF
				Lower	Upper	
Age	-0.47	0.23	0.04	0.40	0.98	1.07
Career goals achievable in Army.	-0.30	0.14	0.03	0.57	0.98	1.18
DHA Control of Army Medicine	-0.62	0.17	0.00	0.39	0.75	1.25
Constant	2.05	0.67	0.002			

Note. $N = 281$. DHA = Defense Health Agency VIF = Variance Inflation Factor
Low coefficients (B), standard errors, confidence intervals and VIFs support no significant multicollinearity of the data.

The three final IVs were considered for interactions at each level of IV. A lack of significant interaction was demonstrated by the Wald test as each interaction was not significant (Arifin, 2016). The p -value of the Hosmer and Lemeshow Test was .951. Being greater than 0.05 demonstrated a good model fit to the data (Arifin, 2016). The differences between the observed and predicted values of the DV ranged from 0.04 to 1.42 supporting a good model fit (Arifin, 2016). The classification table calculated the model fit 81% of the data. See Table 8 for the final model describing factors predictive of U.S. Army PA retention.

Latent Class Analysis

LCA was the next inferential analysis used and answered research questions two and three. Research question two asked to identify the different subgroups of U.S. Army active-duty PA retention. Research question three asked if the subgroups of LCA have similarities with the subgroups of the PWST.

Table 8*Factors Predictive of U.S. Army Physician Assistant Retention*

Factors	<i>b</i>	Adjusted <i>OR</i> (95% CI)
Age	0.228	0.628 (.402, 0.982)
Belief career goals achievable in Army Medicine	0.140	0.743 (0.565, 0.978)
DHA Control of Army Medicine	0.165	0.539 (0.389, 0.745)

Note. $N = 281$. DHA = Defense Health Agency. Every 10 years of age increased likelihood of intent to serve 20 or more years by 62.8% from ages 20 years to 60 years. Ranking career goals can be achieved in the Army each point higher on a 5-point scale from 'Extremely likely' (5) to 'Extreme Unlikely' (1) increased likelihood of intent to serve 20 or more years by 74.3%. Ranking Defense Health Agency control of military medicine would affect retention decisions each point higher on a 5-point scale from *Extremely Likely* (5) to *Extremely Unlikely* (1) increased predicted intent to serve 20 years or more years by 53.9%.

A two observed variable LCA can be represented by:

$$\pi_{ijt}^{ABX} = \pi_t^X \pi_{it}^{AX} \pi_{jt}^{BX}, \quad \text{for } i = 1, \dots, I; j = 1, \dots, J; \\ t = 1, \dots, T.$$

where variable *A* and *B* are observed variables with *I* and *J* classes respectively (Hagenaars & McCutcheon, 2002). The observed variables are conditionally independent of each other given the class level on the latent variable *X* which has *T* classes.

Assumptions. The following assumptions of LCA were considered:

1. Non-parametric.

LCA does not assume any assumptions of linearity, normal distribution, or homogeneity (Statistical Solutions, n.d.).

2. Data should be categorical or ordinal data (Statistical Solutions, n.d.).

The data set was Likert and binary data which are both categorical.

3. Classes are independent of each other (Lee et al., 2020).

Mplus version 8 and later use Bayesian LCA modeling utilizing an “approximate zero” which helps accommodate violations of class independence by relaxing this assumption to an assumption of approximate independence (Asparouhov & Muthen, 2011). Bayesian LCA modeling has been demonstrated to help overcome this assumption (Lee et al., 2020).

Results. LCA was completed in Mplus 8.7 starting with the following initial syntax:

Title:

Latent Class Analysis.

Data:

File is (file location of csv file inserted here);

Variable:

names = Pa St Au Ju So In Pr Op De;

usevariables = Pa St Au Ju In Op De;

categorical = Pa St Au Ju In Op De;

classes = c (1);

Analysis:

Type = mixture;

LRTstart s= 0 0 40 8;

Plot:

Type is plot3;

series is Pa (1) St (2) Au (3) Ju (4) In (5) Op (6) De (7);

Savedata:

file is (save file name inserted here, end in .txt);

save is cprob;

format is free;

output:

tech11 tech14.

The method proposed by Asparouhov and Muthen (2012) was used to choose the number of classes that represented the best fit. The initial number of starts and optimizations for class one had an actual loglikelihood. However, the larger and more complex classes had a replicated or nonreplicated loglikelihood, so the number of random starts and optimizations was increased for each class greater than one until the loglikelihood remained the same as it was for the previous lesser number of random starts and optimizations (Asparouhov & Muthen, 2012). When the loglikelihood remained unchanged after increasing the random starts, the likelihood ratio tests (LRTs) were completed. A p -value < 0.05 indicated the more complex model was a better fit than the simpler model with one less subgroup (Nylund-Gibson & Choi, 2018). To further support class selection, the Bayesian Information Criteria and Sample Size Adjusted Bayesian Criteria were observed with the smaller values indicating a better fitting model (Nylund-Gibson & Choi, 2018). See Table 9 for results.

After determining the 3-class model was the best fit for the data, the probabilities of each class finding each variable significant were reviewed. The first class, the sensitive stayers, comprising 35.9% of the population, had the lowest turnover (8%) and the greatest chance of being affected by the other variables relevant to retention. The second class, the moderates, comprising 56.8% of the population, had the middle number of turnover (23%), and was in between class 1 and 2, with concern for the variables affecting retention. The final class, the

indifferent leavers, had the highest turnover probability (32%) and the lowest concern for the variables affecting turnover. See Table 10 for LCA probability scale.

To help answer research question three, if the subgroups from LCA are similar to the PWST, the probability each class would rank a variable as affecting their turnover decisions was plotted. See Figure 8 for this plot.

Table 9

Latent Class Analysis Classes Selection

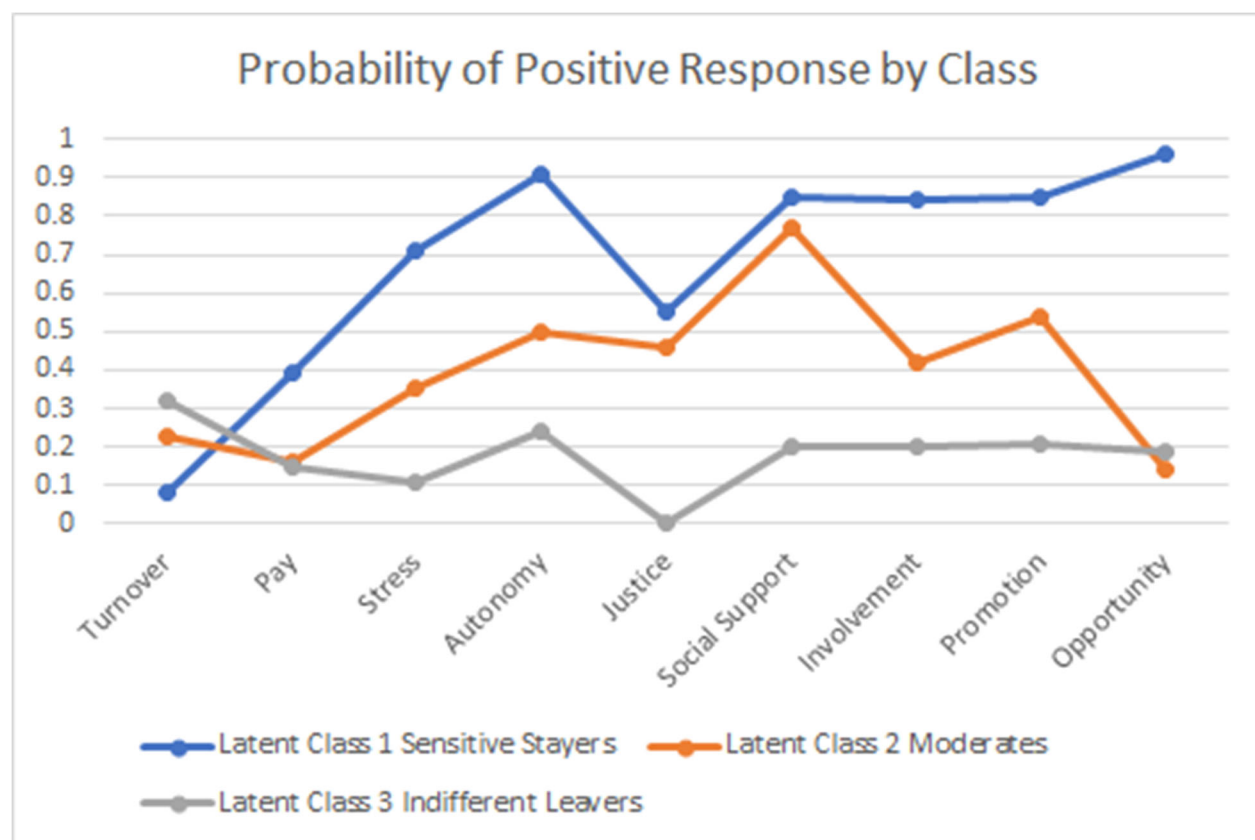
Classes	Random Starts	Loglikelihood	Vuong-Lo-Mendell LRT p-value	Lo-Mendell-Rubin LRT p-value	BIC	aBIC
1	40 8	-2378.7			4853.3	4799.4
2	40 8	-2202.7 R				
2	100 20	-2202.7 R	0.02	0.02	4602.7	4491.7
3	40 8	-2147.4 R				
3	100 20	-2147.4 R	0.01	0.01	4593.7	4425.6
4	40 8	-2107.7 R				
4	100 20	-2107.7R	0.26	0.26	4615.7	4390.6

Note. $N = 281$. LRT = Likelihood Ratio Test. BIC = Bayesian Information Criteria SSA = Sample Size Adjusted R = Replicated. When the number of random starts replicated a loglikelihood. Random starts were increased until the same loglikelihood was returned. Then the LRTs, BIC and SSA BIC were considered. The LRTs compare current class to previous lesser class with a $p\text{-value} > 0.05$ indicating the complex model is a better fit than the simpler model. The smallest BIC and SSA BIC suggest the best model fit. The three-class model was demonstrated to be the best fit from both LRTs and BICs.

Table 10*Latent Class Analysis Probability Scale*

Variable	Response	Latent Class 1	Latent Class 2	Latent Class 3
Pay	Not Affected	0.38	0.64	0.73
	Neutral	0.23	0.20	0.12
	Affected	0.39	0.16	0.15
Stress	Not Affected	0.19	0.51	0.80
	Neutral	0.10	0.13	0.09
	Affected	0.71	0.35	0.11
Autonomy	Not Affected	0.05	0.26	0.59
	Neutral	0.05	0.24	0.18
	Affected	0.91	0.50	0.24
Justice	Not Affected	0.21	0.09	0.89
	Neutral	0.25	0.46	0.11
	Affected	0.55	0.46	0.00
Social Support	Not Affected	0.03	0.00	0.49
	Neutral	0.13	0.23	0.31
	Affected	0.85	0.77	0.20
Involvement	Not Affected	0.00	0.29	0.52
	Neutral	0.16	0.29	0.28
	Affected	0.84	0.42	0.20
Promotion	Not Affected	0.04	0.14	0.57
	Neutral	0.12	0.33	0.22
	Affected	0.85	0.54	0.21
Opportunity	Not Affected	0.04	0.50	0.62
	Neutral	0.00	0.36	0.18
	Affected	0.96	0.14	0.19
Turnover	Not Intended	0.93	0.77	0.68
	Intended	0.08	0.23	0.32

Note. $N = 281$. Probability is the prediction how an individual in a latent class would respond. Latent Class 1 had the lowest probability of planned turnover while latent class 3 had the highest probability. Latent Class 1 had the highest probability of rating all the other variables as affecting their turnover decisions while Latent Class 3 had the lowest probability of rating the other variables affect their turnover decisions.

Figure 8*Probability of Positive Response by Class*

Note. $N = 281$. Turnover is probability individual in the class intends to leave prior to 20 years of service. Probability a given variable affects intent to stay was plotted for the remaining variables. Latent Class 1 the “Sensitive Stayers” had the lowest rate of turnover and were most likely to state the other variables affected their intent to stay. Latent Class 3 had the highest rates of turnover and were the least likely to stay the other variables affect their intent to stay. Latent Class 2, the “Moderates,” fell between the variables of Latent Class 1 and 3.

Multinomial Logistical Regression

Research question four asked “Would factors associated with the intent to stay for 20 years of service predict the subgroups created by LCA?” After determining the classes for each respondent using LCA, multinomial logistical regression was used to predict class membership using the variables able to predict turnover from the previous binomial logistic regression that answered research question number 1. These variables predictive of turnover were age, belief

career goals achievable in Army Medicine, and feeling DHA control of Army Medicine would affect retention. They were used to see if they could predict the three classes from LCA: sensitive stayers, moderates, and indifferent leavers.

Multinomial logistical regression uses maximum likelihood estimation to evaluate probability of categorical membership of more than two categories of dependent variables using multiple independent variables (Starkweather & Moske, 2011). In contrast, binomial logistic regression predicts only binary DVs, so the two possible outcomes are assumed to be dependent on each other as outcomes are either 0 or 1, and therefore odds ratios are used (Hilbe, 2009). The multinomial models have multiple categorical outcomes that are not assumed to be ordered or dependent on each other, so the relative risk of being in a category compared to the other categories was used instead (Hilbe, 2009). These probabilities may be generalized as:

$$\log(odds) = \text{logit}(P) = \ln (P/1-P) = a + b_1x_1 + b_2x_2 + b_3x_3 + \dots$$

where: p = probability that a case is in a particular category, a = constant, b = coefficient of predictor variables (Shi, n.d.).

Assumptions. The following assumptions of Multinomial Logistical Regression were considered:

1. No multicollinearity (Starkweather & Moske, 2011).

No multicollinearity was demonstrated during the binomial logistic regression (Table 7).

2. Exclusion of outliers (Starkweather & Moske, 2011)

Two outliers were eliminated using the Mahalanobis Distance during previous inferential analysis.

3. Independence of irrelevant alternatives (Hilbe, 2009).

Also known as IIA, this assumption is preference for a given choice is unaffected by the presence of other alternative choices (Hible, 2009). Both the Hausman-McFadden test of IIA (Hausman & McFadden, 1984) and the Small-Hsiao (1985) test eliminate one choice of the IV to see if the model fits better which is a violation of the assumption of independence of irrelevant alternatives (Hilbe, 2009). During the determination of number of classes in LCA, several tests were used when increasing the number of classes and rejecting the more complex model when the model with less classes was a better fit. These tests were the Bayesian Information Criteria, Sample Size Adjusted Bayesian Criteria, Vuong-Lo-Mendell likelihood ratio test (LRT) and the Lo-Mendell-Rubin LRT test. By increasing the number of classes by one to determine if the more complex model was a better fit, and if so, then repeating until the more complex model was not a better fit, this method created a model without irrelevant alternatives. This is an advantage of performing multinomial logistic regression on data initially created by LCA. In fact, due to the difficulty in meeting the IIA assumption, both in developing tests to demonstrate the assumption has been met, and in the difficulty in populations meeting the assumption, latent class modelling has been explored as an alternative to multinomial logistic regression (Broers, 2018).

Results. The dataset in SPSS was expanded by adding the variable latent class using the latent class assigned to each respondent from the Mplus output file from the LCA described above. The three predictors for intent to stay for 20 years of service—age, DHA control of Army medicine, and career goals achievable in the Army—were compared to the three latent classes using multinomial logistical regression in SPSS version 27. The likelihood ratio chi-square test during the multinomial logistical regression found the model significant [$\chi^2(6) = 219.7, p < .001$].

Goodness of fit was mixed as Pearson's chi-square test indicated the model does not fit the data well [$\chi^2(136) = 12174.4, p = 0.00$] and the Deviance chi-square test indicated good fit [$\chi^2(136) = 123.0, p = .78$].

The only variable found to significantly predict all three subgroup class memberships was belief career goals were achievable in the Army [$\chi^2(2) = 159.0, p < .001$]. As belief career goals were achievable in the Army increased by each point on the 6-point Likert scale, likelihood of membership in the moderates decreased by an odds ratio of 0.015 ($b = -4.2, SE = 0.5, p < 0.001$) versus being a sensitive stayer. Each point higher in career goal belief also decreased the odds ratio of being an indifferent leaver versus being a sensitive stayer by a ratio of 0.066 ($b = -2.7, SE = 0.4, p < 0.001$). So as belief career goals were achievable in the Army rose, likelihood of being a sensitive stayer increased over being a moderate or an indifferent leaver. See Table 11.

Table 11

Factors Predictive of Class Membership

	<i>B</i>	<i>SE</i>	<i>p</i>
Sensitive Stayers vs Moderates			
Age	-0.71	0.38	0.06
Belief Career Goals Achievable in Army Medicine	-4.17	0.5	<0.001
DHA Control of Army Medicine	-0.6	0.26	0.02
Sensitive Stayers vs. Indifferent Leavers			
Age	-0.63	0.28	<0.001
Belief Career Goals Achievable in Army	-2.72	0.44	<0.01
DHA Control of Army Medicine	-0.36	0.21	0.08
Moderates vs. Indifferent Leavers			
Age	0.08	0.26	0.75
Belief Career Goals Achievable in Army Medicine	1.45	0.22	<0.001
DHA Control of Army Medicine	0.25	0.17	0.14

Note. $N = 281$. Multinomial logistical regression looked at factors predictive of intent to stay to see if they predicted class membership in the classes determined by Latent Class Analysis. Belief career goals achievable in Army predicted relationship between all classes. DHA control of Army medicine predicted Sensitive Stayers versus Moderates. Age predicted Sensitive Stayers versus Moderates.

Feeling DHA control would affect retention was only able to predict being a sensitive stayer versus a moderate [$X^2(1) = .54, p < .02$]. As feeling DHA control would affect retention increased by one point on the Likert Scale, the odds ratio decreased probability of being a moderate versus a sensitive stayer by 0.544 ($b = -.61, SE = .26$). Age was only able to predict being a sensitive stayer versus an indifferent leaver [$X^2(1) = .533, p < .02$]. As age increased every 10 years, likelihood of being an indifferent leaver versus a sensitive stayer decreased by an odds ratio of 0.533 ($b = -.63, SE = .28$). See Table 11 for the full results.

Chapter Summary

This chapter started with descriptive statistics of the demographics of the respondents and questions in the survey. Pearson chi-square and binomial logistic regression explored the factors associated with U.S. Army active-duty PA retention for research question number one. Factors that were significantly related to U.S. Army active-duty PA retention per chi-square included likelihood to recommend Army medicine, DHA control, job satisfaction, and belief career goals were achievable in the U.S. Army. The factors predictive of U.S. Army active-duty PA retention per binomial logistic regression were age, belief career goals achievable in the Army, and belief DHA control of the Army would affect retention.

LCA answered research question number two and three. Three subgroups based on U.S. Army active-duty PA retention needs were created through LCA for research question two. These subgroups were labeled to answer research question three, how the subgroups related to the PWST. These subgroups were labeled the sensitive stayers, moderates, and indifferent leavers based on their different retention rates and likelihood to rate variables as affecting their retention decisions.

Multinomial logistical regression used factors able to predict retention to attempt to predict the latent classes to answer research question four. Belief career goals were achievable in the U.S. Army was the only variable able to predict all the subgroups created by LCA. The next and concluding chapter, Chapter 5, summarizes the study, discusses the results, and details the practical and theoretical implications from this study on the retention of U.S. Army active-duty PAs.

Chapter 5: Discussion, Conclusions and Recommendations

Summary of the Study

Retention models have not been able to significantly predict retention, leading to many studies recommending further research to improve the models (Garver et al., 2008; Price, 2001; Xu & Payne, 2018). This lack of predictability is also seen while reviewing multiple past studies of retention that examine different military specialties. These studies have a broad array of findings and recommendations, limiting the transferability of the findings of these studies to U.S. Army PAs (Chaffin et al., 2008; MacManus & Strunz, 1993; Marble et al., 2020; Pehrson & Hamlin, 2002). One cause of this variance in results, when considering studies of different specialties, may be the factors affecting retention for each military occupation being varied. For example, the amount of competition for PAs from civilian jobs is oftentimes higher than occupations with skills utilized more exclusively in the military (Soliz, 2012). Opportunity, or the ability to transfer skills in another job, is an important retention variable (Price, 2001).

A study on a similar profession, such as U.S. Army Physicians, incorporates many factors that may similarly affect U.S. Army PA retention. However, PAs and Physicians have significant occupational differences that create different retention environments. Currently, retention studies produce recommendations with limited generalizability (Maertz, 2012; Price, 2001), supporting the need for studies to be specific for target populations to make relevant recommendations. Beyond supporting the need for separate retention studies for each specialty, the impact of these differences in occupation when studying single occupations may have contributed to creating many different retention theories and the lack of a single widely accepted standard (Booth-Kewley et al., 2017; Chaffin et al., 2008; Pehrson & Hamlin, 2002; Wojcik et al., 2020).

Retention theories should be evaluated in multiple populations before determining their generalizability.

The post-positivist paradigm was chosen for this study as it reflected the paradigm most often used in current retention literature, and selecting it helped to utilize and expand on previous research. Early retention research often used a positivist paradigm, assuming that truth is “objective, measurable and generalizable” (Egbert & Sanden, 2014, p. 33). This earlier work attempted to accurately predict retention through continuously improving modeling (Price, 2001). When most retention researchers decided retention could not be predicted, many researchers began using a post-positivist view (Maertz, 2012). Post-positivists believe an objective assumption helps understand data; however, they also believe data can be complex and lead to multiple perspectives (Egbert & Sanden, 2014). The rise of post-positivism in retention studies is seen in person-centered retention theories such as PWST, the unfolding model, and job embeddedness theories, which honor the complex and multiple perspectives of individuals rather than the single objective reality of positivism.

The quantitative approach allowed for an analysis of a large amount of data to generalize the results. Individuals may have extremely specific retention needs, only a few of which could have been explored with a qualitative examination. However, providing overall retention strategies were better enabled by analyzing a larger dataset, which requires a quantitative approach.

The purpose of this quantitative, non-experimental, cross-sectional study was to provide recommendations for improving U.S. Army active-duty PA retention while also improving theoretical employee retention understanding. A survey was created by the Statistical Cell at the U.S. Army Center of Excellence based on a recent survey of U.S. Army active-duty Physicians

after being modified by senior PA leaders. A link to the survey was given to all active-duty PAs by the Statistical Cell through the official military email system. Two hundred and ninety of the 864 PAs (J. Kocher, personal communication, April 14, 2021) completed the survey for a participation rate of 34%. The study used population-based and subgroup-based analysis to study the retention needs of this population using a two-fold approach. To enable this two-fold approach, this study created a conceptual model by combining a population-based retention model with a subgroup-based retention model. The conceptual model was later refined after considering the results from this study.

Research Question One

The first research question was “What factors are associated with U.S. Army active-duty PA intent to stay for at least 20 years of service?” Weighted means of responses, chi-square test of independence, and binomial logistical regression compared the intent to stay for 20 years.

Weighted Means. Weighted means provided a straightforward way to rank all the questions by importance, although did not determine if the differences were significant. Chi-square test of independence evaluated if the groups intending to stay for 20 or more years were significantly different than those who did not intend to stay for each variable. Binomial logistical regression created a formula that determined the strength of prediction for the intent to stay for the variables found significantly predictive.

When looking at the weighted means of responses to assessing the work environment, active-duty U.S. Army PAs most strongly believed they knew the job deployment requirements, followed by their work expectations, and then their confidence in performing their duties while deployed. U.S. Army PAs spend more time than most other Army healthcare professionals in operational units providing prehospital healthcare (B. Burk, personal communication, March 14,

2020). This may explain their confidence in performing their duties while deployed. Another key factor in these high ratings may be overconfidence in abilities from self-assessment bias (Walfish et al., 2012).

The next two strongest-rated work environment factors by weighted means of responses were being proud of Army medicine and feeling respected. Being proud of Army medicine and feeling respected were also highly rated in a similar study of U.S. Army physicians (Wojcik et al., 2020) and has been reported in the U.S. military overall (Jones & Saad, 2011). Being proud of one's job and feeling respected create organizational commitment, which increase retention (Li et al., 2016).

When looking at the weighted means of the frequencies for upcoming changes affecting the intent to stay (see Table 3), new medical readiness measures ($M = 3.29$) was the factor most perceived to be linked to retention intents. Medical readiness classification is a determination made by health care providers to communicate a soldiers' ability to perform their wartime mission (based on their specialty) to their commander (Department of the Army, Headquarters, 2019). The goal of the Sustainable Readiness Model was to increase combat readiness of Army brigade combat teams to two-thirds by 2023 (Feickert, 2021). The new medical readiness measures streamline the process of how healthcare providers (such as PAs) report these changes to leaders through an administrative portal (Department of the Army, Headquarters, 2019). Given U.S. Army PAs are often the link between the military healthcare system and the commanders, it is logical that a change to this system influences U.S. Army PA retention, although this variable was not significant in the rest of the analysis.

Limited promotion opportunity ($M = 1.82$) had the lowest rating of concern based on the weighted means of the intent to stay. This is surprising given the historical difficulty PAs have

had with promotions (Soliz, 2012; Detro, 2010). The low concern for the limited promotions may reflect increased optimism in U.S. Army PAs having improved promotion rates (Department of the Army, U.S. Army Human Resources Command, 2021). It may also result from the amount of prior enlisted time of the respondents; averaging 6-10 years prior to commissioning may lead to most PAs able to reach 20 years of service without having to face the more difficult historic promotion hurdles of Major and higher (Soliz, 2010).

Another factor possibly accounting for the low concern for promotion rates may be a bias in the study, as separated officers, including those separated for non-promotion, were not included in the study. If officers are not selected for promotion twice, they are eligible for selective continuation, depending on the needs of the Army, per Army Regulation 600-8-29 (Department of the Army, Headquarters, 2020). Another factor may be the perception that the rates of selective continuation have increased, although these rates are not published, so an actual increase in selective continuation rates cannot be verified. Some combination of these factors may explain why limited promotion rates had the least concern by weighted means for respondents in the survey.

Chi-square Test of Independence. The chi-square results found male active-duty U.S. Army PAs who responded to the survey were significantly more likely to intend to stay for 20 years than female active-duty U.S. Army PAs. This is supported in other studies, with the attrition rate of females in the military being about twice that of males (Department of Defense, 2019). Braun et al. (2015) found retaining females in the military to be a problem, which is particularly important in Army medicine, as female military providers can improve care for females in deployed environments. Since 1994, the congressionally mandated Department of Defense's Women's Health Research Center has been working to improve military women's

health (Friedl, 2005). This study suggests this work needs to continue to improve female active-duty U.S. Army PA retention.

Age was the other demographic that significantly varied based on intent to stay during the chi-square analysis. Age is correlated with increased amount of military service, so it is expected that, as age increases, the closer the service member is to 20 years of service, and the more likely they will stay for at least 20 years. Due to this association, the increased likelihood to stay 20 years is not particularly useful for a study aimed at providing recommendations to improve active-duty U.S. Army PA retention.

When using chi-square test of independence, likelihood to recommend Army Medicine was found to significantly vary based on intent to serve 20 years. Likelihood to recommend is an employee loyalty question demonstrating advocacy behavior (Hayes, 2008). This advocacy behavior has been linked to job satisfaction, organizational commitment, and improved retention (Tanwar & Prasad, 2016).

Job satisfaction was also found to vary based on retention intent. This supports job satisfaction being a secondary variable in the conceptual framework and has been found in numerous previous retention studies as the variable most predictive of retention (Alvinus et al., 2017; Chen et al., 2011; Lu et al., 2016; Price, 2001). Perceived DHA control of Army Medicine would affect retention, and belief career goals were achievable in the Army, were both variables found relevant to describing differences in retention to stay by chi-square and in the binomial logistical regression later in this chapter, where they will be described in more detail.

The blended retirement system (BRS) significantly related to intent to stay by chi-square test, despite most PAs having the opportunity to stay in the traditional retirement system in 2018. In 2018 they had the opportunity to opt-in to BRS; however, most PAs had enough prior military

experience at that time to make the traditional retirement system more likely be a better financial deal (Laatsch, 2017). BRS may be more significant in later PA retention studies as they will incorporate PAs who joined after 2018 and will need to account for their autoenrollment into the BRS.

The BRS provides a 401k matching incentive for PAs even if they do not complete 20 years of service in return for a lower annual retirement rate if they continue to 20 or more years. Those enrolled in BRS receive 2% of their base pay per year if they retire versus 2.5% of base pay per year for those who receive the traditional retirement. The decreased annual retirement incentive and addition of 401k matching, even if one does not serve for 20 years, may both decrease the incentive for PAs to stay for 20 years of service and/or encourage them to serve longer than 20 years (Asch et al., 2015).

The perceived impact of non-financial incentives was ranked significantly different among those with different retention intents, although financial incentives were not significantly different. The military provides many non-financial incentives that include free health insurance, free dental insurance to servicemembers and low-cost dental insurance to families, a tax-exempt housing allowance, and unique job opportunities. These non-financial incentives may be seen as much more extensive than the majority of their civilian nonfinancial incentive alternatives.

Officers from medical units being assigned to nonmedical units was not found to be significantly different based on retention intents. This may be because PAs are already often assigned to nonmedical units. Similarly, the possible National Defense Authorization Act of 2017 directing cuts to Army Medicine may not significantly differ, due to a feeling that PAs will not be affected by this cut. As U.S. Army PAs are often not assigned to medical units, they may perceive themselves to be spared from any cuts.

Another nonsignificant question was additional specialty training opportunities, such as the Long-Term Health Education Training (LTHET). These include opportunities to earn doctorates in emergency medicine, surgery, orthopedics, epidemiology, and education. A lack of significance may be because the impact of these opportunities is limited by the small numbers of positions available each year and/or the lack of attractiveness of the opportunities. Those who are accepted into these programs incur additional obligatory service time after completing these programs, which brings them closer to 20 years of service and could make those who complete these programs more likely to want to serve for at least 20 years.

Binomial Logistical Regression. Binomial logistical regression found belief that career goals were achievable in the Army; DHA control of Army Medicine and age were the only variables able to significantly predict retention intents. As respondent age was older by each 10-year group specified in the survey, intent to serve 20 years increased by 62.8%. This is expected as years of military service are higher in older service members. The longer the years of military service, the closer a servicemember is to 20 years of service. Age being linked to retention is not particularly insightful or useful from a military retention perspective, given that the 20 years retirement is an incentive to keep people in for 20 years and an incentive for them to leave afterwards (Department of Defense, 2008).

Belief DHA control of the military healthcare system affects retention intents predicted intent to stay for at least 20 years. As belief DHA control of the military would affect intent rose 1 point on the Likert scale, intent to stay for at least 20 years rose by 54%. DHA was created to unify military medicine under one command to improve medical readiness, improve health, enhance the care experiences, and lower costs (Defense Health Agency, 2013). The four strategic priorities of the DHA are great outcomes, ready medical force, satisfied patients, and fulfilled

staff (Defense Health Agency Campaign Plan, n.d.). Among those who found DHA gaining control of all military medicine as important to their retention, DHA may be perceived to improve and standardize training and the clinical environment throughout the Department of Defense, so patients receive the best care and outcomes. Additionally, DHA may decrease job stress by lessening the difficulty of fulfilling job duties due to high workload, role ambiguity, resource inadequacy, and role conflict (Shelley, 2010). Consequently, belief in DHA control of military medicine positively affecting retention may reflect a belief this change will decrease stress or lead to other beneficial effects.

Belief career goals were achievable in the Army was also predictive of intent to stay. As belief career goals could be achieved in the Army rose by 1 point on the Likert scale, intent to stay at least 20 years increased by 74%. The belief career goals are achievable in the job demonstrate a good fit of the individual to the job. The job embeddedness theory predicts this good fit improves retention (Mitchell & Lee, 2001). A good fit also improves retention under the unfolding model as a good fit helps individuals overcome the shocks of negative events without changing preexisting plans and decisions to quit (Burton et al., 2010).

The conceptual model of this study incorporates both job embeddedness and the unfolding model through the PWST (Maertz, 2012), so the model predicts a good fit will improve retention. Figure 2 demonstrates how enthusiastic stayers can be converted into enthusiastic leavers through shocks. As good fit decreases the impact of shocks, the conversion of enthusiastic stayers to enthusiastic leavers should decrease with good fit and the belief career goals were achievable in the job (Hom et al., 2012).

Research Question Two

The second research question was “What are the different subgroups of Army active-duty PA retention?” LCA was completed using Mplus 8.7 by selecting predictor variables consistent with the conceptual model. LCA identified three classes as the best model of fit. Latent Class 1 was labeled the sensitive stayers. They are the stayers because they had the lowest predicted turnover (8%). They are sensitive because they perceived the different variables affected their retention decisions more than the other two groups. The variable most likely to affect retention for the sensitive stayers was opportunity (96%), the belief career goals were achievable in the Army. This was followed by autonomy (91%), belief at work they could do what they do best. The variable least likely to affect retention for the sensitive stayers was pay (39%).

Latent Class 3 was labeled the indifferent leavers. They are leavers because they had the highest turnover (32%). They are indifferent as they ranked the perceived impact for the variables affecting retention the lowest. They were most concerned with autonomy (24%), belief at work they could do what they do best. They were least concerned with justice (0%), belief their unit does a good job of formally recognizing excellent work via awards or certificates.

Latent Class 2 was labeled the moderates. They are the moderates as they had moderate rates of turnover and perceived impact of the variables affecting retention. They ranked largely in between the sensitive stayers and the indifferent leavers. They were most concerned with social support (77%), that their unit does a good job of supporting them as a person. They were least concerned with opportunity (14%), the belief career goals were achievable in the Army.

Research Question Three

The third research question was “Are their similarities between the subgroups from LCA and the subgroups (enthusiastic leavers, reluctant stayers, reluctant leavers, and enthusiastic

stayers) of PWST?” The number of classes that best fit the LCA modeling was three. If the number of classes of best fit would have been four, it may have made it easier to relate the study to the four classes under the PWST. However, the priority was identifying the best fit, not ease of supporting this research question. The subclasses of this study were labeled sensitive stayers, moderates, and indifferent leavers; based on that, their probabilities of being affected by the selected variables was inverse to their likelihood to want to stay for 20 years.

Another difficulty in matching the actual study results to the theory was PVC was not directly assessed in this survey. Military service is characterized by contractual obligations that play a significant role in PVC of servicemembers and was asked in the survey; however, it does not fully represent PVC. PVC is a result of both internal and external forces, with internal forces including the physical opportunity to leave, such as after completing a contractual obligation (Maertz & Campion, 2004). However, PVC is also affected by external forces such as social support and community embeddedness (Maertz & Campion, 2004). While this survey asked about external forces, it did not fully assess the internal forces to accurately determine PVC. In a study on PWST, Li et al. (2016) directly assessed PVC by asking three questions: if it were mostly up to them if they could stay, if they have a great amount of control over the decisions, and if it was not up to them if they stay.

The intent to stay was accounted for in the creation of the latent classes by the variable turnover assessing if the respondents intended to stay for 20 or more years. However, PVC was not assessable. Not having PVC assessable meant parameter restraints could not be created to evaluate PWST through Confirmatory LCA (Finch & Bronk, 2011). Lacking these restraints meant this study needed to use the more popular form of LCA, Exploratory Factor Analysis,

which lacks guidance from assumptions about the nature and number of latent classes (Finch & Bronk, 2011).

Instead of PVC, the primary variables from the causal model were used as predictor variables. Therefore, the LCA classes generated reflect more on the primary distal variables of retention of the causal model rather than only the proximal classes of PWST. However, PWST was still helpful in describing the latent classes, as the stayer portion of the sensitive stayers was inspired from the enthusiastic and reluctant stayers of the PWST. The leaver portion of the indifferent leavers was inspired by the enthusiastic leavers and reluctant leavers of PWST.

The job embeddedness model, which was a precursor theory to the PWST, finds turnover is related to the nature of the commitment to the job (Kiazad et al., 2015). The other precursor theory to the PWST, the unfolding model, describes how job commitment creates a script that reinforces turnover intentions until hit with a significant event called a shock (Mitchell & Lee, 2001). The questions in this survey include many that ask how different variables are perceived to affect their intent to stay. This leads to results that expand on the theoretical ideas of commitment and suggest higher rates of commitment are associated with more concern for the impact of distal variables relevant to retention. Conversely, lower rates of commitment are suggested to be associated with less concern for the impact of distal variables of retention.

However, this sensitivity may be increased in the military population given the large incentive to stay 20 years for retirement benefits and the contractual nature of military service. Employment contracts and pensions have been demonstrated to change employee-employer relations and turnover decisions (Jordan et al., 2015; Stevens, 2004). Evaluating these questions in a non-military population would help with the generalizability of increased commitment leading to increased perceived impact of the distal variables of retention.

Research Question Four

The fourth research question was “Would factors associated with the intent to stay for at least 20 years of service predict the subgroups created by LCA?” Multinomial logistical regression used variables predictive of the intent to stay to see if they could predict the classes created by LCA. Belief career goals were achievable in the Army was able to predict membership in all three latent classes. As belief career goals were achievable in the Army rose on the Likert scale, likelihood to belong to the sensitive stayers increased over the other classes. Being the only variable able to predict the intent to stay further demonstrates its value in retention modeling.

Perceptions on the reforms because a single organization, the Defense Health Agency (DHA), oversees all military medicine was able to distinguish two of the three subgroups from LCA. The sensitive stayers versus moderates could be distinguished based on their perceived impact of DHA in charge of Army Medicine, but not the sensitive stayers versus indifferent leavers. It may be that those who have decided to leave are not sensitive to the upcoming changes from DHA.

Age was only able to distinguish the two groups with the most differences from each other, the sensitive stayers versus the indifferent leavers, but not the moderates versus the indifferent leavers. As discussed previously, age-predicting retention is expected as increases in age are associated with increased length of military service and increased probability of being closer to 20 years of service. Older active-duty U.S. Army PAs are more likely to have decided to serve 20 years, as they have had more opportunities to leave and are closer to having served 20 years, and this survey did not include those who had already left. The relationship of age to desire to serve at least 20 years does not necessarily mean selecting older soldiers to become PAs

will increase their intent to serve at least 20 years. Also, if selecting older soldiers to become PAs, given they tend to have increased years of service, they will tend to be eligible for the retirement pensions faster than younger soldiers. For these reasons, age being tied to retention has less relevance on developing strategies to improve U.S. Army PA retention.

Discussion

The results of this study were compared to the literature to suggest which insights of the study were specific to U.S. Army PAs and which insights had broader practical and theoretical implications. Belief career goals were achievable in the Army was the variable associated with retention throughout both the population-based analysis and the subgroup-based analysis. Career goals incorporate an individual's unique desires (Kaye & Giulioni, 2012). Difficulty in the predictiveness of models of retention, such as the causal model (Price, 2001), may stem from not accounting for the various levels of importance of the variables for an individual based on their goals and preferences (Hom et al., 2012). The recent emphasis of person-centered retention models supports the need for person centered approaches to retention (Hom et al., 2012). Due to the difficulty in accounting for an individual's goals, predicting retention may not be achievable; however, these models can still help researchers and managers understand the retention process (Maertz, 2012).

Adding the secondary variable "goals achievable" helps explain and account for the differing levels of importance of the primary variables by individual preferences. It turns the model from a global model that does a poor job of predicting retention into an individualized tool. A manager can use this model as a guide when conducting performance growth interviews and helping employees to develop their goals.

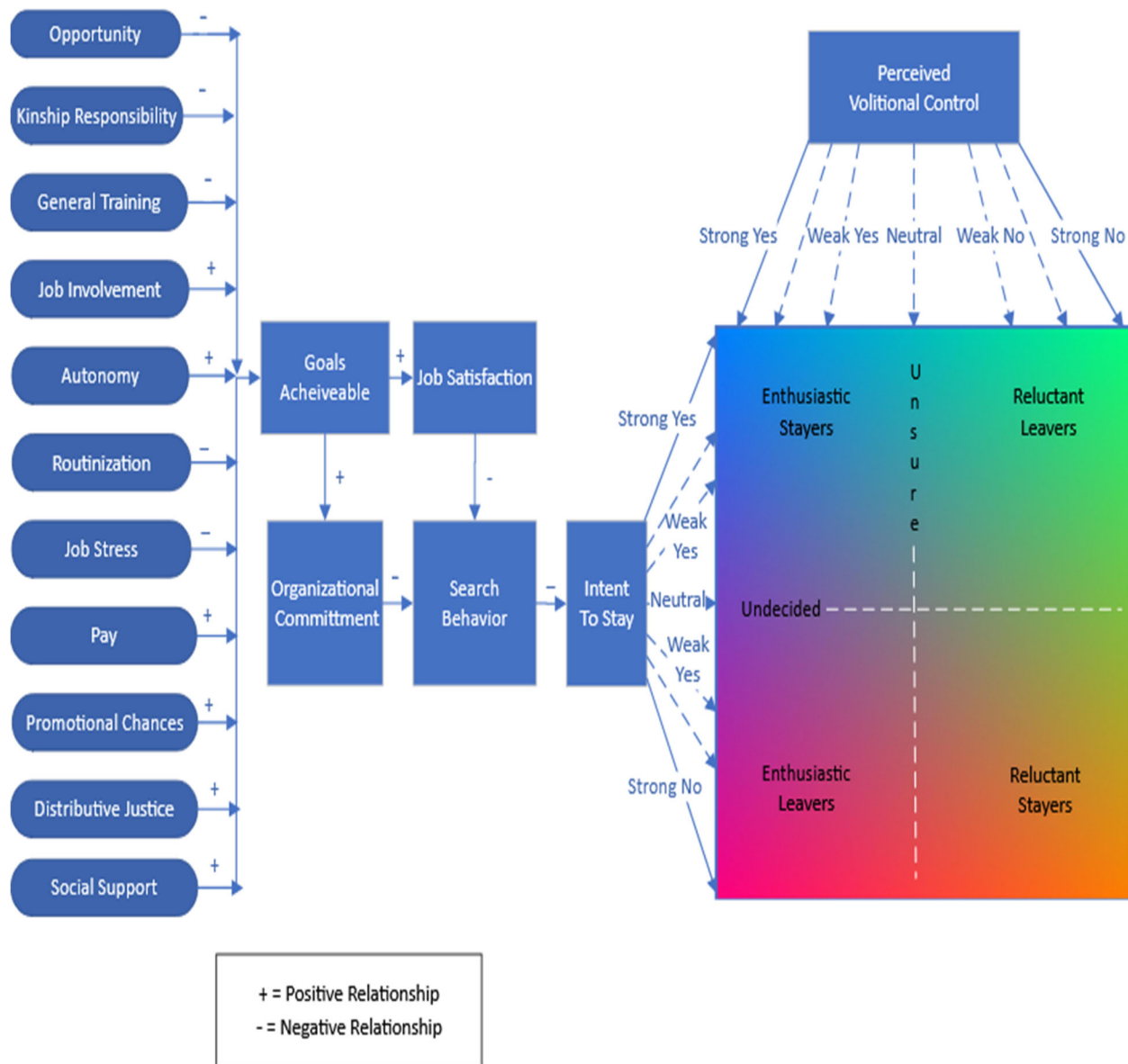
PWST has been praised for incorporating both the job embeddedness theory and the unfolding model (Maertz, 2012). The original conceptual model was an attempt to explain how the classes from the PWST are created using the variables from the causal model. Adding “goals achievable” accounts for an individual’s preferences of the distal primary variables making them person-centered. As the primary variables in the causal model (examples general training, promotional chances and pay) change in relative importance based on an individuals’ goals and preferences, their ability to create job satisfaction and organizational commitment vary based on the individual. Therefore, these distal variables can be more coherently joined with the person-centered PWST on the right side of the conceptual model.

A second change to the conceptual model is the elimination of turnover. It may seem impractical to remove turnover in a model of retention; however, maximizing turnover prediction is not a critical goal in retention research (Maertz, 2012). Predicting exactly when someone will leave in advance is impossible due to the unpredictability of future events (Lee & Mitchell, 1994). Continuously measuring variables may help increase prediction but is impractical (Maertz, 2012). Furthermore, even if a model of turnover were able to predict turnover, it would not necessarily explain the cause of the turnover or offer any practical advice to improve retention (Maertz, 2012).

A final change to the conceptual model is a response to a criticism of PWST. Maertz (2012) states that collapsing intent to stay and PVC from a range with differing magnitudes as it exists, to simply a yes or no binary, is problematic. For example, Maertz (2012) states that family pressure is often a force exerting pressure over PVC but does not necessarily push one’s PVC completely into either a simple binary yes or no.

To account for a range of strength in intent to stay and in PVC, the conceptual framework was adjusted to depict a continuum starting with a strong yes, gradually transitioning to a weaker yes, to neutral, to a weak no and ending with a strong no. A color gradient was added to reinforce the continuum nature of the four groups. A combination of strong responses creates the strongest identification of each class in the corners of the model. As an individual changes from a strong yes to a weaker yes or from a strong no to a weaker no, their identification with each class weakens. An individual being undecided on their intent to stay and/or unsure of their PVC has been included in the model at the neutral regions in the intersections between the classes. See Figure 9 for the addition of goals achievable and the continuum of PWST into the conceptual model.

This conceptual model answers several of the problems Maertz (2012) critiques of the PWST. First, it includes the antecedent distal forces through the inclusion of the causal model that Maertz (2012) argues is not a separate construct, as in the PWST. Second, the inclusion of the variable “goals achievable” accounts for the varying levels of importance an individual places on each of the primary variables affecting retention, depending on the individuals needs and preferences. While Maertz (2012) states that these antecedent forces may be a latent unmeasurable construct, this research suggests they may be measurable if accounting for an individual’s preferences and desires by considering their career goals. Finally, it accounts for a range of intent to stay and PVC, rather than a simple binary choice, as in the original model. This gradual color spectrum change of the model can better incorporate the unfolding model than the original model. The position a person lies along the continuum tends to have semipermanence due to preconceived scripts that resist change in position. Significant events can overcome the script and cause changes in position on the color spectrum.

Figure 9*Revised Conceptual Framework*

Note. The conceptual framework incorporated the causal model of turnover with the proximal withdrawal state theory. Goals Achievable was added due to being significantly predictive of retention and the subgroups formed by LCA. The four classes of Enthusiastic Stayers, Reluctant Leavers, Enthusiastic Leavers, and Reluctant Stayers are formed by the relative strength of the responses to intent to stay and perceived volitional control over retention decision. Individuals are more strongly associated with a class the closer they are positioned in each corner.

The importance of career goals being achievable is supported by the top reasons people stay being found to be (in order of importance) meaningful work, supportive management, being valued, and career growth (Kaye, 2014). This importance may have grown over time as employees are increasingly beginning to demand the ability to define their own career paths and customize their work (Morgan, 2014). People feel valued when they can demonstrate their strengths, safely express their ideas, and have their ideas taken into consideration (Engelmeier, 2012). These trends only increase the importance of work-based goals being achievable as part of improving retention.

Understanding retention is important to managers, as at least 75% of the reasons for voluntary turnover can be affected by managers (Robinson, 2008). According to Kaye and Giulioni (2012), the most important thing a manager can do for the success of a business may be to develop its employees by helping them identify and meet their career goals. Dialogues with employees can enable setting up measurable, achievable growth plans, with goals utilizing the employees' talents and desires while meeting the needs of the business (McKeown, 2002). Through meeting individual employees and later providing real-time feedback and recognition, managers can lead by example, build teams that can communicate well, and empower and support each employee (Engelmeier, 2012).

Managers can provide feedback following a conversation about an employee's goals to co-create an effective employee growth plan (Kaye, 2014). Developing these growth plans with employees may be particularly important early in their career to engage them early in the organization and set up positive scripts in employees' minds that improve retention (Coughlan & Patton, 2018). When jobs meet their employees' needs, they create engaged employees who are more productive, with fewer work-related problems, in addition to having better rates of turnover

(Rothwell et al., 2014). This is most effectively done by listening to employees, crafting strategies together to empower all employees to challenge past assumptions, removing obstacles, and communally creating easily relatable goals targeted to their employee's needs. (Engelmeier, 2012).

Growth counseling is also important in the military. The quality of interactions between junior officers and leaders as role models, mentors, and counselors influences junior officers' intent to stay (Schirmer, 2008). It has been claimed that U.S. Army officers rarely receive high quality counseling, despite more consistent counseling being important to sustain the military (Schirmer, 2008). Army Techniques Publication (ATP) No. 6-22.1 (2014) covers the U.S. Army counseling process, and states that counseling is one of the most important leadership and professional development responsibilities of leaders to develop future leaders. Aligning with civilian research, ATP 6-22.1 states that counseling allows leaders to demonstrate genuine concern for subordinates, helps to empower them, aids in identifying issues before they become problems, and helps subordinates understand their role in the mission. The purpose of professional growth counseling, according to ATP 6-22.1, is for leaders and subordinates to jointly establish a development plan that builds on strengths and overcomes weaknesses. Leaders must consistently provide teaching, coaching, mentoring, and other resources after the creation of the plan of action to meet the desired jointly created outcomes. Through this development counseling process, military leaders are given the opportunity to match the needs of their subordinates with the needs of the Army.

Focusing on the goals of subordinate soldiers builds trust in leaders by demonstrating concern for their interests and helping build their sense of competence (Christina & Fort, 2017). Trust in leaders has been linked to organizational commitment (Bambacas & Patrickson, 2008)

and job satisfaction (Mayfield & Mayfield, 2002). When leaders help their subordinates understand their goals are achievable, they build trust that leads to organizational commitment and job satisfaction, as demonstrated in this revised conceptual model. The leader's ability to build trust is dependent on demonstrating honesty and consistency while listening, creating an open interaction, providing quality feedback, and coaching over time. (Mayfield & Mayfield, 2002; Robbins, 2001). Therefore, the addition of goals achievable in the model helps demonstrate the importance of attitudes about leaders on retention and morale (Kirby & Naftel, 2000). While ATP 6-22.1 is focused on leadership development, the long-term effect of quality growth counseling is an improved belief by their subordinates that they can meet their goals, which will improve their rates of retention.

As a specific example of changes that can help U.S. Army PAs find their career goals achievable in the Army can be seen with those with doctorates in specialty areas. Due to the shortage of U.S. Army PAs, those who obtain doctorates in specialties may have a problem maintaining their advanced specialty skills, as they are often still used in primary care roles. A similar problem of not being able to maintain their advanced skills exists with military surgeons, and their critical shortage has led to new civilian-military partnerships for military surgeons to increase their number of complex surgical cases to maintain their skills (Knudson et al., 2018). Other initiatives to meet these needs include joint training opportunities with all branches of the military, revised clinical practice guidelines, and specialized training activities to meet the needs of military trauma medicine (Knudson et al., 2018). Similar initiatives could help boost U.S. Army PA retention, particularly among the specialty trained PAs.

Limitations

Inferring causal relationships in nonexperimental studies have simple problems which have not been adequately addressed (Diwekar-Joshi & Watve, 2020). While this study only considers correlations, a limitation of the generalizability of these correlations was that it only looked at active-duty PAs. As the goal of this study was focused on active-duty, this population was purposefully selected, as multiple studies of different professions within U.S. Army medicine have arrived at different recommendations (Booth-Kewley et al., 2017; Chaffin et al., 2008; Pehrson & Hamlin, 2002; Wojcik et al., 2020). However, a downside of this approach was the generalizability of the study might be hampered by this focus on a single military profession. This may be particularly important given the unique retention needs of each military healthcare profession. Examples of the uniqueness of U.S. Army PAs is the high amount of prior enlisted time in new active-duty U.S. Army PAs and their tendency to be assigned to regular nonmedical military units.

A second limitation is also common to many retention studies. This study only polled U.S. Army active-duty PAs, so members who have left active-duty did not have the ability to provide their input into the study. The data from servicemembers who have departed could have provided additional insights to improving retention. Additionally, the dataset could be seen as being biased as it had an increased number of people planning to serve 20 years since those who had already left were excluded. However, it is difficult to learn the needs of the employees who have left an organization due to the difficulty in identifying them and having them respond to an inquiry. As a former military healthcare recruiter, it was rare for former military healthcare members to respond to calls or emails. To address the lack of input from those who have left,

other studies have recommended using exit interviews to help improve retention (Liu & Raghuam, 2022).

Another limitation is response bias. While the response rate was high for a survey (33.6%), those who did respond may not represent the population. Survey fatigue in U.S. military personnel can occur, as they frequently receive survey requests; those who decided to respond to this survey may be more likely to want to serve 20 years or have different feelings about retention than the rest of active-duty U.S. Army PAs. A lack of the sample representing the population is supported by respondents representing higher ranks being overrepresented in the survey per chi-square comparison of the sample to the population. The highest LCA group of the respondents were “sensitive stayers” because they were sensitive to the variables affecting retention. This sensitivity may have also led them to want to respond to the survey in numbers larger than the actual population.

The response bias may be particularly important as U.S. Army active-duty PAs serve at locations throughout the world and retention issues significant at a given location may not be as significant at other locations. This potential variance may be worsened by LCA if it does not capture the subgroups representative of actual subgroups in the population. Even if the subgroups of LCA are representative of the population, the subgroups may be misinterpreted. Weaknesses of current retention theories demonstrate our difficulty in interpreting the subgroups of retention and this difficulty may contribute to inaccurate conclusions (Li et al., 2016; Maertz, 2012).

The survey instrument was built on a past retention survey of U.S. Army Physicians after feedback from senior military healthcare leaders. However, it was not based on the conceptual model of this study, so questions had to be selected to represent the variables in this model

during the LCA analysis. Impreciseness with fitting questions from the surveys to the variables of the model may have hampered the accuracy of the results.

Many retention studies collect data with tools not created using retention theory and only two studies have been driven by data to understand PWST (Li et al., 2016; Liu & Raghuram, 2020). While this study represented an independent analysis of the theory, as a secondary dataset, it also increased the possibility that LCA would have created subgroups that may not benefitted from knowledge of the subgroups in PWST. Even when using primary data created to analyze a theory, the ability to identify theoretical subgroups in actual populations is complicated, due to the difficulty in delineating between the different classes of PWST in actual data (Hom et al., 2012).

Also, this study was set in the culture of U.S. citizens within the subculture of the U.S. military. The United States is a very individualized culture that stresses specialists performing independent jobs and a moderately low power distance between hierarchy (Gannon & Pillai, 2016). The U.S. military is a subculture of the United States, featuring collectivism with rules enforcing cohesion and high-power distance between members of different ranks (Suzuki & Kawakami, 2016). The findings of this study, particularly the importance on individual career goals, may be influenced by the combination of these two opposing cultural dynamics, which may have various levels of importance in other cultures. These cultural influences may lead to data unrepresentative of the population as many military members may feel uncomfortable or unmotivated to participate or pressured to answer with socially desirable responses (Wojcik et al., 2020). While the survey was anonymous, individuals may have worried about being identified, even though efforts were made to de-identify them.

Finally, the theoretical construct may oversimplify the complex human process of job retention decisions into simple categories. Categories created by dichotomous choices, such as the yes or no of the intent to serve 20 years or more, does not allow for strong and weak responses, which may better reflect reality in the complex real world of human retention decisions. An analysis of the study accounting for strong and weak responses could lead to different results. Individuals sometimes make irrational and/or spontaneous retention decisions that limit the predictive value of retention theories (Hom et al., 2012). Cross-Sectional surveys may pick up temporary short-lived feelings, or not accurately evaluate retention needs due to poor selection of questions, subject incomprehension, and/or difficulty in accurately measuring relevant factors (Seo et al., 2004). This is complicated by the variables used in retention models suffer from difficulty in being accurately measured and have been poor at predicting retention rates (Hom et al., 2012).

Recommendations and Suggestion for Future Research

Not limiting retention to majority analysis is important, as the needs of subgroups can be masked by the needs of the overall population (Hom et al., 2012). Continuing to develop methods that draw from population-based studies while also incorporating the newer subgroup-based studies helps understand the needs of both the population and its subgroups. This study conducted a novel two-fold population and subgroup-based method utilizing a new conceptual model uniting both population and subgroup-based theories. To continue to refine this method, studies should be conducted using a survey tool revised from the conceptual model of this study. With this data, a simple structure equation model for the intent to stay using this new conceptual model can help validate it. Follow-up studies could also use the chi-square test of independence to see if there is a significance difference between the predicted subgroups measurement and the

actual subgroup membership from LCA. Also, the short answer data was not considered but this rich data could be analyzed to help triangulate the data and reveal new insights.

In addition, to increase the transferability of this conceptual model, a revised survey tool should use the two-fold technique outlined in this study and evaluated on other populations incorporating occupations other than U.S. Army active-duty PAs. Initially some of the lessons learned may be limited to the specific occupation studied. After learning lessons from these isolated studies, a study involving multiple occupations should be conducted to see if the model and technique can be utilized in groups of mixed occupations. This may help to refine both the model and the technique for broader application and understanding of retention. Newer cluster analysis techniques allow for model-based clustering, classification, and density estimation that may help in studies of mixed occupations (Scrucca et al., 2016).

The significance of belief career goals is achievable leads to the need of survey tools to examine how an employee's career goals being achievable affect retention. A tool created from this conceptual model could help leaders understand their employee's needs, be more effective in developing plans to help them reach their goals, and effectively follow-up with these plans. A proof of effectiveness from this process could be if leaders utilizing this tool created more enthusiastic stayers than those who did not. If this was demonstrated, leaders may more effectively engage their employees to make them more effective/productive and retain them in this competitive environment.

A recent initiative asked senior PAs to conduct exit interviews of active-duty PAs leaving the service, using a standardized list of questions (B.A. Soliz & J. Jones, personal communication, October 26, 2021). Exploratory research on interviews of those who left the service could be considered to help overcome the current limitations of this study and provide a

more complete picture on retention. A similar methodology to the dissertation might be used or, given the smaller numbers, a mixed methods or qualitative approach might be considered.

Finally, this tool can also be used to demonstrate how employee's proximal withdrawal states change over time. With this conceptual model the distal variables such as opportunity, job stress and pay, the intermediate variables of goals being achievable, job satisfaction and organizational commitment, and the four PWST classes can all be considered under one model. Tracking how the intermediate and distal variables change for individuals and how they affect their place on the continuum of the four proximal classes can help bring a better understanding on how scripts create semipermanence on the continuum and how shocks create change in position on the continuum.

This research study suggests employees perceived ability to meet their career goals is a powerful variable in retention modeling. Further studies should analyze longitudinal studies to consider the effect employees perceived ability to meet their career goals on retention and effectiveness of organizations. An experimental study could involve providing training for some leaders to help their employees see how their career goals could be met in their organizations. The retention rate of employees with leaders who have received this training could be compared to a control group with leaders who did not receive this training. A mixed method approach could help triangulate the effects of this intervention.

Conclusion

This study sought to improve retention recommendations of U.S. Army PAs by combining the population-based analysis represented by the causal model of turnover with subgroup-based analysis represented by the PWST. These two theories were combined into a single conceptual model for the study. Population based analysis was completed to associate and

predict factors related to retention. LCA provided insights into retention of subgroups not covered by the traditional regression analysis (Xu & Payne, 2018). To draw the study together, factors that predicted retention in the population were considered for their ability to predict the subgroups created by LCA.

Considering the practical recommendations from both population-based analysis and subgroup-based LCA provided a more complete understanding of the retention needs and improved the practical value of retention recommendations. This two-fold (population and subgroup) approach is a unique method to analyze retention of different populations while allowing consideration of a wide array of retention theories to improve theoretical understanding and drive effective practical change. The population-based approach allowed for an overall understanding of retention needs while the subgroup approach focused on the selected predictor outcomes and considered the needs of each subgroup independently.

This twofold method highlighted the importance of the belief career goals were achievable in the current workplace, as it was the only variable found to be significant throughout the two-fold method of this study. Given the different nature of these two quantitative techniques, the triangulation of finding this variable significant in both supports the importance of belief career goals being achievable as an important variable for retention. Previous retention models suffered from lack of predictability of retention, which may be due to not accounting for people having different goals and values when creating retention models (Maertz, 2012; Price, 2001). Adding belief career goals achievable in the current workplace to the model may help account for this lack of predictability by accounting for the variance in an individual's retention needs. Rather than trying to predict retention, the revised conceptual model becomes a tool for

leaders to help to understand the retention process and the retention needs of their employees so they can assist in their growth and productivity, which will lead to improved retention.

Helping employees meet their career goals may be the most important thing a leader can do to help their organization (Department of the Army, Headquarters, 2014; Kaye, 2014). The needs of each employee to meet their career goals varies by the individual and should be assessed individually while leaders codevelop development plans with their employees (Kaye, 2014). To be more successful in this process, the conceptual model from this study can help a manager understand an employee's motivations, match them to opportunities in the workplace with the goal of helping employees to become engaged enthusiastic stayers. This method of career development engages employees, creates a positive workplace culture, makes employees more satisfied and productive, and may be the single most crucial step a manager can do to create a successful organization (Engelmeier, 2012).

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Appendices

Appendix A

Application for Brooke Army Medical Command Approval

Brooke Army Medical Command Human Research Protections Office		APPLICATION FOR A NOT RESEARCH DETERMINATION																	
<p>BAMC staff who plan to perform an activity but are unclear as to whether it constitutes research or an activity that is not research such as utilization review, performance or quality improvement and who desire a formal review and determination regarding the activity should complete this application and submit to an Exemption Determination Official (EDO).</p> <p>Instructions:</p> <p>1) The <u>check-boxes</u> can be initialized by double clicking them and selecting “checked”</p> <p>2) Once complete, enter your signature block below the e-signature box and electronically sign the document</p> <p>3) Send the application and any applicable document (surveys, questionnaires, handouts, etc.) to an EDO for review</p>																			
Section 1: General Contact Information																			
Name of project lead:	CPT Robert Greener, PA-C																		
Dept. & Organization	187 th MED BN, Student Detachment (Guest Provider at BAMC)																		
Email address:	Robert.k.Greener.mil@mail.mil	Phone Number:	260-492-3409																
Other staff on project:		Date of submission:	5/10/2021																
Title of project:	Army Physician Assistant Retention Needs Based on a Recent Active-Duty survey																		
Section 2: Parameters <i>Select all that apply</i>																			
<input type="checkbox"/>	The project includes testing the safety and efficacy of a drug or device in a human subject.																		
<input type="checkbox"/>	You PRIMARILY intend the information you learn from this project to be generalizable beyond your institution																		
<input checked="" type="checkbox"/>	You PRIMARILY intend the information you learn to provide immediate and continuous improvement and feedback at your institution																		
<input type="checkbox"/>	The activities or interventions are considered standard of care																		
<input type="checkbox"/>	Data will be collected from living individuals through some type of intervention																		
<input type="checkbox"/>	You will interact with a living individual																		
<input type="checkbox"/>	You will access individually identifiable information <i>If yes, specify the identifiers below</i> <table border="0"> <tr> <td><input type="checkbox"/> Names</td> <td><input type="checkbox"/> Dates</td> <td><input type="checkbox"/> Photo or audio recordings</td> <td><input type="checkbox"/> License number</td> </tr> <tr> <td><input type="checkbox"/> Address</td> <td><input type="checkbox"/> Phone numbers</td> <td><input type="checkbox"/> Unique code, including rank</td> <td><input type="checkbox"/> VIN number</td> </tr> <tr> <td><input type="checkbox"/> SSN or MRN</td> <td><input type="checkbox"/> Fax numbers</td> <td><input type="checkbox"/> Health plan number</td> <td><input type="checkbox"/> IP address</td> </tr> <tr> <td><input type="checkbox"/> E-mail</td> <td><input type="checkbox"/> Biometric identifiers</td> <td><input type="checkbox"/> Device identifiers</td> <td><input type="checkbox"/> URL</td> </tr> </table>			<input type="checkbox"/> Names	<input type="checkbox"/> Dates	<input type="checkbox"/> Photo or audio recordings	<input type="checkbox"/> License number	<input type="checkbox"/> Address	<input type="checkbox"/> Phone numbers	<input type="checkbox"/> Unique code, including rank	<input type="checkbox"/> VIN number	<input type="checkbox"/> SSN or MRN	<input type="checkbox"/> Fax numbers	<input type="checkbox"/> Health plan number	<input type="checkbox"/> IP address	<input type="checkbox"/> E-mail	<input type="checkbox"/> Biometric identifiers	<input type="checkbox"/> Device identifiers	<input type="checkbox"/> URL
<input type="checkbox"/> Names	<input type="checkbox"/> Dates	<input type="checkbox"/> Photo or audio recordings	<input type="checkbox"/> License number																
<input type="checkbox"/> Address	<input type="checkbox"/> Phone numbers	<input type="checkbox"/> Unique code, including rank	<input type="checkbox"/> VIN number																
<input type="checkbox"/> SSN or MRN	<input type="checkbox"/> Fax numbers	<input type="checkbox"/> Health plan number	<input type="checkbox"/> IP address																
<input type="checkbox"/> E-mail	<input type="checkbox"/> Biometric identifiers	<input type="checkbox"/> Device identifiers	<input type="checkbox"/> URL																
<input checked="" type="checkbox"/>	You intend to publish this project?																		

Section 3: Project Description

Part I: Process, program, or system to be improved or assessed

Currently U.S. Army Active-Duty (AD) Physician Assistant (PA) retention efforts include a 4-year retention bonus and specialized training opportunities. The retention bonus and specialized training offerings have changed over time. No published studies have looked at the effectiveness of U.S. Army PA retention efforts. U.S. Army PAs are unique as: they are all prior service, AMEDD officers less likely to be of MEDCOM, 95% obtain their credentials at a military school (IPAP), generally evaluated by nonAMEDD officers and have the lowest rates of promotion to MAJ and above of all AMEDD officers. This study will look at the perceived retention needs of U.S. Army AD PAs to improve retention efforts.

Part II: Purpose and/or intent

The purpose of this study is to evaluate the perception of effectiveness of current U.S. Army PA retention measures and job satisfaction from its Active-Duty (AD) members. Data has been obtained from a recent survey of all AD Medical Service (MS) and Specialist Corps (SP) members. This information will be analyzed, and the results shared with the AD U.S. Army PA retention group. This retention group will then share these recommendations with senior AD Army PA leaders. The information will also be used to shape future studies such as qualitative surveys shaped by this primarily quantitative survey.

Part III: Performance indicators / Quality Benchmarks

A survey was given out to all Medical Service and Specialist Corps members which was created with input from the author of this study and several leaders of the Specialist Corps. It consists of questions on recent program and policy changes which may affect retention, job and leadership satisfaction and current retention plans. The study was based on a previous study of Medical Corps officers which was also conducted by the same research team:

Wojcik, B. E., Stein, C. R., Guerrero, K., Hosek, B. J., Humphrey, R. J., & Soderdahl, D. W. (2020). Army Physician Career Satisfaction Based on a Medical Corps Survey. *Military Medicine*. <https://doi.org/10.1093/milmed/usz480>

The results of this second study of MS and SP Officers were given to CPT Greener by the head of the Specialist Corps after being cleared for release through a Freedom of Information Act request. See attachment for the survey questions and results.

Part IV: Project Description / Methodology

A retention survey was distributed to all AD MS and SP officers through official AKO email. It consists of 100 multiple choice questions and 6 short answers. Participation was voluntary, anonymous and did not requiring answering every question to submit. Results of this survey were given to the head of the Specialist Corps. Data is not identifiable other than some emails of respondents were given. The emails will be removed from the data.

This project will analyze the majority quantitative data using multivariate logistic regression and latent class analysis. Latent class analysis (LCA) will be performed to identify subgroups within the sample based on their retention needs. LEM 1.0 will be used with ordinal indicator parameters as specified in section 5.2.3 of the LEM manual. SPSS will be used for the rest of the quantitative analysis. Text mining and in-depth analysis will be used to analyze the qualitative data based on frequency of response and provide rich illustrative examples. The information will be used to create a dissertation paper at the University of the Incarnate Word as part of a School of Choice Long Term Health Education Training (LTHET)- PhD in Education.

Analysis of this data will be shared with the author's dissertation committee as needed to assist in the analysis process through the raw data will not be shared with this committee. A defense of this dissertation will be completed at the University of the Incarnate Word. The head of the SP Corps, the senior PA leaders and the AD PA retention committee are aware of this project and are expecting to read the results of this study.

Part v: Data to be collected

Retention and satisfaction data were obtained during a recent Medical Service and Specialist Corps survey of all AD members was received by the author of this study from the head of the SP corps after permission for the release was obtained through a FOIA act request. The survey consists of 2597 responses though only the 283 PA respondents will be analyzed.

Part VI: Anticipated effect on process, program, or system

Results will be used to inform an Army PA retention board considering recommendations for changes to Army PA retention initiatives. The Army PA retention board will share this information with senior PA/SP corps leaders to provide informed recommendations for improved efforts at retaining U.S. AD Army PAs.

Signature was placed here

****Add your signature block here before signing****

Note. Was signed on 5/10/2021 by Robert Greener. Signature not provided here.

Appendix B

Brooke Army Medical Command Approval



DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY MEDICAL CENTER OF EXCELLENCE
3630 STANLEY ROAD
JBSA FORT SAM HOUSTON, TEXAS 78234-6100

ATMC-DT-P (1200B)

May 10, 2021

MEMORANDUM FOR CPT Robert Greener, PA-C, SP, USA

SUBJECT: Determination for Proposed Project
PROJECT TITLE: Army Physician Assistant Retention Needs Based on a Recent
Active-Duty Survey (MEDCoE project number 20-10007p)
DETERMINATION: Not Research
REVIEW TYPE: Institutional

1. The US Army Medical Center of Excellence Office of Research and Human Subject Protections (MEDCoE ORHSP) has received and reviewed the above-referenced project.
2. The submission proposes an analysis of an internal program evaluation survey to the U.S. Army Physician Assistant (PA) students in order to improve retention of Active Duty PAs. In addition to the command supported project, the analysis will be used by CPT Greener in his capstone project in his Long Term Health Education Training (LTHET) PhD in Education. As proposed, the project does not meet the definition of research IAW 32 CFR 219.102(I).
3. The review of this project does not imply institutional approval to conduct it. All applicable approvals by departments such as Information Management (for a release of information), must be completed prior to initiation.
4. All publications, presentations or abstracts arising from this work must be cleared through appropriate publication clearance procedures.
5. The MEDCoE ORHSP point of contact for this review is Ileana King-Letzkus at (210) 221-8572 or ileana.e.king-letzkus.civ@mail.mil.

A handwritten signature in black ink, appearing to read "I. King-Letzkus", is positioned above the printed name and title.

ILEANA E. KING-LETZKUS, CIP
Human Protections Director
Office of Research and Human Subject Protections
U.S. Army Medical Center of Excellence

Appendix C

University of the Incarnate Word Application

Wednesday, November 24, 2021

Use this questionnaire to determine if you need to submit your project to the UIW Institutional Review Board for review.**Enter your name and email address to receive a pdf copy of the questionnaire upon submission:**

Robert Greener

rgreener@student.uiwtx.edu

Click 'Next' to begin.

First, you will be asked a few questions to determine if your project involves **human subjects**.

Click 'Next' to continue.

Do you plan to obtain data about living individuals?☐ Yes

This means the data provide information ABOUT individual living people, not simply collected FROM individual living people.

Information gathering interviews with key informants where questions focus on things, products, or policies, rather than individuals or their personal thoughts, feelings, or opinions, do NOT count as "data about living individuals." An example of this would be an interview with a company manager where the questions focus on the how a product is made.

Note: if you plan to obtain biological specimens (such as blood or saliva samples) of living individuals, your answer here should be 'Yes.'

Click 'Next' to continue.

Do you plan to intervene or interact with individuals?☐ No

Intervention includes both physical procedures by which data are gathered (for example, veripuncture) and manipulations of the subject's environment that are performed for research purposes.

Interaction includes communication or interpersonal contact between investigator and subjects.

Typical examples include face-to-face meetings, phone conversations, and physical or electronic correspondence. The distribution of anonymous online surveys qualifies as an interaction.

Click 'Next' to continue.

Private information includes information about behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place, and information which has been provided for a specific purposes by an individual and which the individual can reasonably expect will not be made public (for example, a medical record).

Private information must be **individually identifiable** (i.e., the identity of the subject is or may readily be ascertained by the investigator or associated with the information) in order for obtaining the information to constitute research involving human subjects.

Click 'Next' to continue.

Do you plan to obtain identifiable private information about individuals?☐ No

link they all received in their official military emails. The data set consists of 290 anonymous respondents who volunteered to complete the data through the military survey instrument milSurvey. Each participant is identified with a record number which is not traceable to a person. The survey was conducted by the Statistical Cell of U.S. Army Medical Center of Excellence after they obtained IRB approval from the U.S. Army Medical Center of Excellence.

Briefly explain why you believe the activity does not require UIW IRB review:

I obtained the data after a Freedom of Information Act request approved on April 9, 2021. I received an IRB nonresearch determination by the local Army hospital IRB (BAMC) on May 10, 2021. The study was conducted anonymously and voluntarily. The data-set is secondary data, neither I nor the group who conducted the survey interacted with the anonymous participants. The volunteers completed the survey through a link given to them through email. The data is non-identifiable with 290 participants. No attempts will be made to identify the individuals and no one will be able to identify individuals from participating in the defense or reading the publication of results. There is no foreseeable risk to the participants in the study. Prior to publication of the data, the U.S. Army Public Affairs Office will review the data to ensure no harm to the military.

Click 'Next' to continue.

Based on your responses it is possible that your project *will involve human subjects*.

That's the first step. Next, you must determine whether or not the project meets the federal definition of regulated research.

Click 'Next' to continue.

Next, you will be asked a couple of questions to determine if your project involves regulated research. Research means a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge.

Click 'Next' to continue.

A **systematic investigation** is an inquiry that is characterized by a *predetermined and organized* method of data collection and analysis to study a specific topic, answer a specific question, test a hypothesis, or develop a theory.

Click 'Next' to continue.

This is the most challenging question to answer when determining if an activity meets the definition of **regulated research**. A study that is designed to develop or contribute to generalizable knowledge applies and/or expands upon existing scholarly or scientific knowledge and will support conclusions that hold (generalize) across contexts and populations.

Several common activities involving human subjects and systematic data collection are similar to **regulated research** but do not satisfy this criterion. Examples include Quality Improvement, Quality Assurance, Program Evaluation, and Needs Assessment. These projects usually intend to seek feedback about and/or improve upon a specific program or process within a specific, limited setting. Relatedly, a project involving data collection may occur within the context of a class assignment with the goal of contributing to a student's educational experience (e.g., to learn about research methods). Such projects rarely satisfy this criterion because they are not intended to contribute to generalizable knowledge.

Please note that the intent to publish or present the findings of a project *does not in and of itself* determine whether a project was *designed* to contribute to generalizable knowledge.

Click 'Next' to continue.

Based on your responses it appears as though your planned project *does not satisfy* the definition of **regulated research**.

Assuming this is correct, IRB review and approval of your project is not required because the IRB does not have the regulatory authority to review, oversee, and/or approve projects that are not regulated research.

In other words, you do not need to submit your project to the IRB for review.

Presentation or publication of the findings of this project is allowed; however, you must avoid claiming

Based on your responses it appears as though your project *will not involve human subjects*. Assuming this is correct, and regardless of whether or not your project satisfies the definition of regulated research, IRB review and approval of your project is not required because the IRB does not have the regulatory authority to review, oversee, and/or approve projects that are not regulated research with human subjects.

In other words, you do not need to submit your project to the IRB for review.

Presentation or publication of the findings of this project is allowed; however, you must avoid claiming that your study received IRB review or approval. You are still expected to follow adequate, discipline-specific guidelines to assure that the project is being conducted in a responsible, professional, and ethical manner.

Click 'Next' to continue.

Would you like to request an official Determination letter from the Office of Research and Sponsored Projects Operations that your project is Not Regulated Research?

Yes

Click 'Next' to continue.

If you would like to request an official Determination letter from the Office of Research and Sponsored Projects Operations that your project is Not Regulated Research, please provide the following information. The ORSPO will respond within 3 business days of submission.

Title of project:

U.S. Army Physician Assistant Retention: A Cross-sectional Survey Using Latent Class Analysis

Name of primary investigator/project lead:

Robert Greener

Email address of primary investigator/project lead:

rgreener@student.uiwtx.edu

Name of Faculty Advisor (if PI/project lead is a student):

Dr. Alfredo Ortiz

Email address of Faculty Advisor (if PI/project lead is a student):

alortiz1@uiwtx.edu

College/School

School of Education

Provide a 3-5 sentence, clear summary of the proposed activity. Please include the purpose and aims of the activity. If the activity is externally funded, please also identify the funding source:

This study will use a recent online survey given to all Active Duty Physician Assistants to identify variables linked to retention intentions. The 75 mostly Likert scale type questions will be analyzed for factors linked to retention using multiple logistical regression. Subgroups within the population will be analyzed using Latent Class Analysis. A comparison of the two types of analysis will then be conducted. This study has no external funding.

Briefly describe all project procedures to be conducted related to project participants (i.e., screening, recruitment, consenting, enrollment, procedures, etc.), types of data being collected, anonymous/identifiable information, and how you will be obtaining data from or about project participants.

All Active Duty Physician Assistants were given the opportunity to participate in the survey through a

that your study received IRB review or approval. You are still expected to follow adequate, discipline-specific guidelines to assure that the project is being conducted in a responsible, professional, and ethical manner.

Click 'Next' to continue.

Click 'Next' to continue.

If you would like to request an official Determination letter from the Office of Research and Sponsored Projects Operations that your project is Not Regulated Research, please provide the following information. The ORSPO will respond within 3 business days of submission.

Click 'Next' to continue.

Based on your responses it appears possible or likely that your planned project *does satisfy* the definition of **regulated research**.

Your earlier responses indicate that your project probably involves **human subjects and regulated research**; therefore, it is likely that your project requires IRB approval prior to initiation.

In other words, **you need to submit your project to the IRB for review.**

Click 'Next' to continue.

The responses you provided should have resulted in feedback regarding whether or not your planned project satisfies the federal definition of human subjects research.

- If it has been determined that your project involves both **human subjects and research**, please proceed to the [UIW IRB website](#) to submit your project for review.
- If one or both definitions are not satisfied, please *do not* submit your project for review.

Refer to the IRB website for additional information on UIW's human subjects protection program and IRB, including administrative and IRB contact information. Feel free to contact the ORSPO or the IRB Chair with any questions about your planned project(s).

Click 'Submit' to complete the questionnaire.

Appendix D

University of the Incarnate Word IRB Approval



11/30/2021

Project Lead: Robert Greener

Project title: U.S. Army Physician Assistant Retention: A Cross-sectional Survey Using Latent Class Analysis

Robert

Your project titled U.S. Army Physician Assistant Retention: A Cross-sectional Survey Using Latent Class Analysis was deemed to be **Not Regulated Research**.

Your proposed project was reviewed and found to not meet federal regulatory requirements for human subject research and does not require approval via the IRB process. Please use the IRB number **NR [21-023]** when inquiring about or referencing this determination.

No further review of the project as proposed is required. Should you determine at any point you wish to add additional elements to the project, please contact us before initiating those components, as this may impact the determination.

For information regarding the IRB or the review process, please contact me at (210) 805-3565.

Sincerely,

Mary Jo Bilicek

Mary Jo Bilicek
Research Compliance Coordinator
Office of Research and Graduate Studies
University of the Incarnate Word
4301 Broadway, CPO 480
San Antonio, Texas 78209
(210) 805-3565
bilicek@uiwt.edu

Appendix E

U.S. Army Public Affairs Office Release Approval

U.S. ARMY MEDICAL CENTER OF EXCELLENCE (MEDCoE)

PUBLIC RELEASE REVIEW FORM

EACH SIGNEE AGREES:

"I am aware that there is foreign intelligence interest in publicly available information. I have sufficient technical expertise in the subject matter to certify that it is appropriate to release this information to the public, because there are no operational, legal, or security reasons for withholding its release. Information that was given a previous Public Release Review, does not require a second review, unless the original information has been changed."

DESCRIPTION OF INFORMATION TO RECEIVE REVIEW:

Title of item to be released: U.S. Army Physician Assistant Retention: A Latent Class Analysis

(Step 1) Author/Originator (Print Full Name): MAJ Robert Kenneth Greener

Organization: AMEDD Student Detachment, 187th MED BN

Phone: 260-492-3409

Forum where this information is to appear: ProQuest Dissertations and Theses Global database

Purpose of release: 12/01/2022

Anticipated date of release: 12/01/2022

(Step 2) Cdr/Supvr: (Print Full Name) CPT Abbey F. Calvo

Grade: O3 Position: AMEDD STU DET CDR Phone: 210-221-5731

Signature: CALVO.ABBEY.FAYE.1398234215 Digitally signed by CALVO.ABBEY.FAYE.1398234215
Date: 2022.06.27 14:42:36 -05'00' Date: 06/27/2022

(Step 3) Foreign Disclosure (if applicable) N/A

Grade: Position: Phone:

Signature: Date:

(Step 4) Legal Office Reviewer (if applicable): N/A

Grade: Position: Phone:

Signature: Date:

(Step 5) OPSEC Reviewer: Harold K. Larvins

Grade: GS12 Position: MEDCoE OPSEC Officer Phone: 210-221-8200

Signature: LARVINS.HAROLD.KENNETH.109 Digitally signed by LARVINS.HAROLD.KENNETH.109
Date: 2022.07.13 20:28:52 -05'00' Date: 07/13/2022

(Step 6) Public Affairs Reviewer: Jose Rodriguez

Grade: GS11 Position: Public Affairs Phone: 210-221-8472


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Date: 2022.07.01 08:47:00 -05'00' Date: 07/01/2022

MEDCoE PUBLIC RELEASE REVIEW

Continuation

Initial and date in appropriate box

- Recommend approval for public release, distribution is unlimited (Distribution A).
- Recommend approval for public release subject to changes as noted or attached.
- Do not recommend public release.
- Comments

	Author	CDR / SUPVR	FDO	Legal	OPSEC Officer	Public Affairs
a. Concur for Public Release	RKG 20220627	AFC 20220627	N/A	N/A		JER
b. Concur for Public Release w/comment						
c. Nonconcur						
d. Comments						

MEDCoE Public Release Review Process

1. A Public Release Review is intended to evaluate government information (document, video tape, voice tape, briefings, articles, or equipment) to determine if it can be designated for unclassified and unlimited (public domain) distribution. The purpose of an OPSEC/PAO Review is to ensure the continued protection of government information, which for operational, legal, or security reasons is considered sensitive or critical information that should not be released to the public.

2. Before a government employee or contractor can release US Government information to the public, it must have an Public Release Review.

3. Review Steps:

Step 1 - Author prepares information for public release.

Step 2 - Commander/supervisor reviews and approves product for release (cannot be the author).

Step 3 - Foreign Disclosure Officer reviews to ensure classified information and controlled Unclassified Information was properly disclosed or released to foreign governments or international organizations.

Step 4 - Legal office reviews *only if contractor or proprietary information is involved*.

Step 5 - OPSEC Officer reviews for operational security, security classification, and foreign disclosure.

Step 6 - Public Affairs Officer reviews for context and if product is consistent with Army mission.

4. The G2 OPSEC Officer will log the review request and return a signed copy of this form to the requester NLT 5 business days. A hard copy of the product will be retained by the MEDCoE G2 for inspection purposes.

Note: All content being submitted for review without this form will not be accepted.

5. Examples of potentially inappropriate information for public release

PERSONNEL OPERATIONS

- Critical personnel shortages by AOC/MOS/ASI.
- Itineraries of VIPs/DVs (O7 and above) visiting a MEDCoE facility or asset (General Officer overseas travel).
- Privacy Act Information / Personnel Identifiable Information (PII).

SECURITY

- Identification of personnel with security clearances and those that have access to classified information.
- Identification and security measures applied against MEDCoE facilities, or assets that are considered Mission Essential Vulnerable Areas (MEVA) or High Risk Targets (HRT).

OPERATIONS

- Specific vulnerabilities, weakness or findings and recommendations (results) of surveys.
- Specific sensitive UNCLASSIFIED operational commitments to supported commands, including preparations for deployments, movements, etc.
- Sensitive UNCLASSIFIED contingency plans in the event of a terrorist, natural, or man-made event that would impact the mission of the MEDCoE.
- Major MEDCoE event times, locations, attendees, and security plans that are held on or off the installation.

LOGISTICS

- Contracts/projects containing classified elements.
- Increased levels of medical support for readiness activities during mobilization/deployment preparation and execution.

INFORMATION

- Location of communications security (COMSEC) equipment and computers that processing classified documents.

RESOURCE MANAGEMENT

- Communication (print or electronic) dealing with shortfalls in training due to funding.

ENGINEERING AND FACILITY MANAGEMENT

- Emergency action procedures in the event of a fire evacuation, shelter in place or bomb threat.

Appendix F
Survey Instrument

Choices for the questions 1-13 were: *Extremely likely, Somewhat likely, Neither likely nor unlikely, Somewhat unlikely, Extremely unlikely, or Not applicable*

(Q1) How likely am I to stay now that the Defense Health Agency (DHA) has assumed the MHS Health Care Delivery mission?

(Q2) How likely am I to stay given the implementation of the new Army Talent Alignment Process (AIM 2.0 assignment process)?

(Q3) How likely am I to stay given changes to command selection processes (e.g., must be able to take all 3 APFT events and not on profile, pass Diagnostic ACFT)?

(Q4) How likely am I to stay given the implementation of the Army Combat Fitness Test (ACFT)?

(Q5) How likely am I to stay Duty given the implementation of the MTOE Assigned Personnel policy (Officers assigned to MTOE units with duty at an MTF, also known as MAP)?

(Q6) How likely am I to stay given the possibility of NDAA 17 directed cuts to Army Medicine? (NDAA = National Defense Authorization Act)

(Q7) How likely am I to stay given the implementation of readiness measures (ICTL / KSAs) and command accountability for creating conditions to maintain AOC specific skills required for battlefield capabilities?

(Q8) How likely am I to stay given the blended retirement system?

(Q9) How likely am I to stay given current opportunities for additional specialty training (e.g., Long Term Health Education and Training)?

(Q10) How likely am I to stay given current OPTEMPO?

(Q11) How likely am I to stay given current financial compensation compared to civilian peers with similar years of experience in my field?

(Q12) How likely am I to stay given non-financial incentives compared to those available to civilian peers with similar years of experience in my field (e.g., Continuing education credits, long term schooling, health care, dental, housing)?

(Q13) If your competitive category has limited promotion opportunity, how likely are you to stay in the military?

Choices for the questions 14-33 were: *Strongly agree, agree, Neither Agree nor Disagree, Disagree, or Strongly Disagree*

(Q14) I know what is expected of me at work.

(Q15) I understand what is required for me to be considered “ready” to perform my deployment duties.

(Q16) I am confident I have the skills necessary to perform the duties expected of me in a deployed environment or deployment setting.

(Q17) I have the materials and equipment I need to do my job

(Q18) I have the administrative support I need to perform my job duties

(Q19) At work, I have the opportunity to do what I do best.

(Q20) Unit Leadership allows me to stay current in my AOC (e.g., CEUs or attend conferences).

(Q21) Unit Leadership allows me to practice as a clinician in my specialty (note: this question was given the additional response option of “N/A – I do not have a clinical specialty”)

(Q22) In the past month I have received recognition or praise for doing good work.

(Q23) My unit does a good job formally recognizing excellent work via awards or certificates.

(Q24) My unit leaders care about me as a person.

(Q25) My unit leaders encourage my development

(Q26) I have confidence in my unit leaders.

(Q27) The mission and vision of Army Medicine make my job feel important.

(Q28) I feel respected at work.

(Q29) In the past 6 months my supervisor has communicated to me about my progress.

(Q30) I have been given adequate opportunities to grow as a leader.

(Q31) I have the ability to influence my next job / assignment.

(Q32) I believe my career goals can be achieved within Army Medicine.

(Q33) I am proud to work in Army Medicine.

Choices for Q34 were: *I have completed my initial ADSO, I will complete my initial ADSO*

within the next 2 years, or I will complete my initial ADSO more than 2 years from now

(Q34) What describes your status with regard to the Active-Duty Service Obligation (ADSO) you have incurred from training (and not from signing a retention bonus)?

Choices for Q35 were: *Extremely likely, Somewhat likely, Neither likely nor unlikely, Somewhat unlikely, Extremely unlikely, or N/A – I am not eligible for a retention bonus or ADSO*

(Q35) How likely are you to sign up for a retention bonus after your ADSO or current retention bonus obligation is completed?

Q36 provided the following answers and respondents were able to select all that apply:

Make my salary competitive with the civilian sector (national average) in my specialty

Improve ancillary support and decrease administrative burdens

Minimize the potential for skill degradation in my specialty

Increase the length of tours and decrease the number of PCS moves

Provide more leadership training and opportunities

Provide more clinical training and opportunities

Increase recognition of good work via awards or certificates

Expand Off-duty Employment opportunities

Improve leadership selection process

Remove poor leaders and hold them accountable

Allow me more active involvement over PCS moves / locations / jobs

Other (A free response write in limited to 200 characters)

There is nothing Army Medicine can do to entice me to extend my ADSO

None of these--I cannot extend my ADSO

(Q36) Which of the following would influence you to continue serving beyond your ADSO?

Q37 asked for one selection from responses in Q36

(Q37) Which initiative should have TOP PRIORITY?

Choices for Q38 were: *Extremely likely, Somewhat likely, Neither likely nor unlikely, Somewhat unlikely, or Extremely unlikely*

(Q38) How likely are you to recommend Army Medicine to other medical professionals as a great place to work?

Choices for Q39 were: *Very satisfied, Satisfied, Neither satisfied nor dissatisfied, Dissatisfied, or Very Dissatisfied*

(Q39) 5. 5. How satisfied or dissatisfied are you with your career as an Army officer?

Choices for Q40 were: *Extremely likely, likely, Neither likely nor unlikely, Somewhat unlikely, Extremely unlikely, N/A, or I have already served 20 years or more*

(Q40) How likely are you to stay on active duty for 20 or more years?

Choices for Q41 were: *Yes or No*, if answered *Yes*, the respondent was prompted to rank up to 6 of the following reasons: *Pay is not competitive, Not enough say in duty assignment, Not enough say in duty location, Lack of resources to support family needs (i.e., spousal job placement, daycare, housing), Family is not happy with military life, and Other*

(Q41) Have you decided to depart the military once your commitments are complete and before you reach 20 years of service?

Those who selected Other in Q41 were given Q42 with the option to provide a short answer

(Q42) If you selected 'Other', please explain.

Those who selected Yes to Q41 were given Q43

(Q43) If you are leaving active duty, how likely are you to serve in the Reserve Component or National Guard?

Choices for Q44 were: *0-5 years, 6-10 years, 11-15 years, 16-20 years or >20 years*

(Q44) How long have you been an officer in the Army Medical Department?

Choices for Q 45 were: *Yes or No*

(Q45) Do you have prior service in the military?

Those who selected Yes to Q45 were given Q46 with choices: *0-5 years, 6-10 years, 11-15 years, 16-20 years or >20 years*

(Q46) How many years of enlisted service did you have prior to commissioning in the Army Medical Department?

Choices for Q47 were: *I did not serve as an officer prior to commissioning in the Army Medical Department, 5 years or less, 6-10 years, 11-15 years, or 16+years*

(Q47) How long did you serve as an officer prior to commissioning in the Army Medical Department

Choices for Q48 were: Yes, No, or N/A

(Q48) Have you completed your Active-Duty Service Obligation training?

Respondents could choose as many of the following Choices for Q49 that applied: Board

Certification, Licensure for your Area(s) of Concentration, Advanced Certifications(s), I have none of these

(Q49) Do you have any of the following:

Choices for Q50 were: Male, or Female

(Q50) What is your gender?

Choices for Q51 were: 29 years or younger, 20-39 years old, 40-49 years old, 50-59 years old, 60 years or older, Prefer not to answer

(Q51) What is your age?

Choices for Q52 were: 2LT, 1LT, CPT, MAJ, LTC, COL, or Prefer not to answer

(Q49) What is your rank?

Choices for Q50 were: MS, or SP

(Q50) To which Corps do you belong?

All the AOCs for the MS and SP Corps were listed as selections for Q51

(Q51) What is your primary AOC?

Choices for Q52 were: Service Academy, ROTC, HPSP, USUHS, OCS, AC/ARNG, or Direct Accession

(Q52) What is the source of your service commitment?

Choices for Q53 were: 0, 1, 2, 3, or >3

(Q53) How many times have you deployed to support named operations?

Choices for Q54 were: *I have never been deployed, 1-6 months, 7-12 months, 13-24 months, or >24 months*

(Q54) Please indicate the approximate total length of time you have been deployed to support named operations.

Choices for Q55 were: *Assigned to an organic position in MTOE unit (not MAP), MTOE assigned with duty at MTF (MAP), MTF TDA (all DHA managed MTFs belong in this category), Non-MTF TDA, or Other*

(Q55) What best describes your current unit of assignment?

Choices for Q56 were: *MEDCEN, Non-MEDCEN Hospital (inpatient capabilities), Clinic / Ambulatory Surgery Center (outpatient only), MTOE Operational Assignment, Public Health Assignment, Non-clinical Administrative Assignment, or Other*

(Q56) What best describes where you work (>50% of your time)?

Those who selected other in Q57 were given Q56 which a short answer

(Q57) What best describes where you work (>50% of your time)?

Choices for Q58 were: *Active Duty, National Guard, or Reserve Component*

(Q58) What is your Compo?

Choices for Q59 were: *Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, or Strongly Disagree*

(Q59) Holistic Health and Fitness (H2F), TRADOC Organic Medical Structure (TOMS), and / or other non-MTF unit assignment opportunities align with my career goals.

Choices for Q60 were: *Extremely likely, Somewhat likely, Neither likely nor unlikely, Somewhat unlikely, Extremely unlikely, or Not applicable*

(Q60) For this question, select 'Neither likely nor unlikely' if the item does not influence your decision to stay. Select 'Not applicable' if the item does not apply to you or if you do not know what the item is referring to. How likely are you to stay on active duty if Talent Management initiatives support 20 years of service / retirement, even if promotion opportunities are fewer?

Q61-66 were short answers

(Q61) If there are other factors that influence your plans to remain on active duty, please list them here:

(Q62) What is the best way for you to receive information?

(Q63) Please list the main reason you entered the Army for your specialty / Area of Concentration (AOC).

(Q64-66) List 3 specific things that Army Medicine could do to improve your experience as an AMEDD Officer. Click in box to replace “None” with your response.1

(Q67-69) Please list three specific things that Army Medicine is already doing well to improve your experience as an AMEDD Officer.

(Q70) Please provide additional comments or feedback that you want your Army Corps Leadership to hear.

Appendix G

Price's Causal Turnover Figure Copyright License Permission

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Expected presentation date	Dec 2022
Portions	Figure 1. Causal model of turnover

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