ASSESSMENT OF TUCSON-AREA FIREFIGHTING HIRING PROCESSES AND FACTORS THAT INFLUENCE APPLICATION NUMBERS.

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Executive Fire Officer Program

by

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Abstract

Fire departments in the Tucson area have traditionally been attractive places to work and their hiring processes have been similar. Applicants looking for employment were typically required to successfully complete a physical ability test, pass a written test, and pass one or more oral boards as parts of the hiring process. Candidates who were successful in these stages were placed on a list to be hired and academies were filled from that list in numerical order as needed. For many years, when hiring processes were opened, it was common to have several hundred to several thousand people apply for very few job openings. Recent history has proven, however, that the number of applications for recruit firefighters has declined significantly at precisely the moment where retirements have necessitated that Tucson-area fire departments hire on a larger scale. The purpose of this study will be to identify potential barriers in hiring processes that are preventing individuals from applying for a career in the fire service in the Tucson area. The study will use a qualitative approach using generic qualitative inquiry and a thorough literature review to explore patterns and identify barriers that may exist. Results from the study will produce recommendations that can be used to subsequently assist Tucson-area fire departments in achieving higher application numbers during their hiring processes (Creswell & Creswell, 2018).

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Contents

CHAPTER 1. INTRODUCTION 6

Background……..... 6

Significance of the Study.....10

Problem Statement.....11

Purpose Statement.....13

Research Questions…….....13

Summary.....13

CHAPTER 2: LITERATURE REVIEW 15

Introduction.....15

Existing Literature 15

Synthesis of the Existing Literature 23

Summary 25

CHAPTER 3: METHODOLOGY 26

Research Design.....26

Population and Sample Size.....28

Instruments.....31

Research Process.....32

Ethical Considerations 34

Summary……36

CHAPTER 4: STUDY RESULTS 37

Introduction……37

Demographics of the Participants 37

Research Results 38

Summary 56

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS 57

Summary of the Results 57

Conclusions Based Upon the Results 58

Limitations 60

Implications and Recommendations to the Field 61

Recommendations for Future Research 62

Conclusion 63

REFERENCES 64

APPENDICES 71

CHAPTER 1. INTRODUCTION

For many years, when Tucson-area fire departments opened their hiring processes, it was common to have several hundred to several thousand people apply for an extremely limited number of job openings. Recent history has proven, however, that the number of applications has declined significantly at precisely the moment where retirements have necessitated hiring on a larger scale. Given the relatively low nationwide unemployment level and increasing competition from private businesses to hire individuals from a limited pool of job seekers, Tucson-area fire departments are seeking ways to increase their application numbers while maintaining a quality employee without reducing standards (U.S. Bureau of Labor Statistics, n.d.). The purpose of this research is to identify barriers that are preventing individuals from applying for a fire service career in the Tucson area and offer options for fire departments to adjust their hiring processes to remove those barriers.

By doing this research, Tucson-area fire departments will be assisted in improving their hiring processes to remove potential barriers that may prevent people from applying. It will use the qualitative method and generic qualitative inquiry to seek answers to questions by interviewing the hiring managers of Tucson-area fire organizations in efforts to understand their hiring processes and how they may be changed to become more accessible to potential applicants.

Background

Tucson is located in southern Arizona at an elevation of approximately 2000 feet and has a desert climate with mild winters and hot, dry summers. The city is surrounded by mountain ranges, and it is a place where outdoor activities such as hiking, biking, and running are enjoyed year around (Tucson Guide, n.d.). There is one large university located in the center of the city

and a community college with satellite campuses interspersed throughout the region. The community college provides classes in fire and emergency service topics that can be used to obtain certifications in those fields.

Tucson and the surrounding area has a population of 542,649, which makes it the second largest city in the state next to Phoenix (United States Census Bureau, n.d.-b). The population of the Phoenix metropolitan area includes several cities with approximately 4,420,568 people and comprises 61% of the population of the state (United States Census Bureau, n.d.-a). Because of the population difference, and subsequently more fire departments, the fire service job market is larger in Phoenix than in Tucson.

There are three major fire service providers in the Tucson area. These departments share an automatic aid agreement and work closely with each other on response models, policies, and strategies and tactics. The region has seen approximately seven percent population growth over the past ten years and new fire stations have been built by each agency to provide adequate coverage for the residents of the new areas (U.S. Census Bureau, n.d.-b).

This population growth, along with an increasing number of incumbent firefighters reaching the point in their careers where they are eligible for retirement, has required all three entities to increase their hiring numbers. Historically, any hiring process would bring considerably more applicants than positions to be filled; however, recent trends have demonstrated that application numbers are decreasing, and the pool of individuals interested in becoming a firefighter is failing to match those of historical norms. These trends are supported by A. DeLong, Human Resources Director at the Golder Ranch Fire District, who says “our numbers for recruitment are not as high as they used to be, and we speak with other agencies in the area who are experiencing the same drops in interest” (personal communication, November

13, 2023). For the Golder Ranch Fire District, application numbers saw a peak in 2017 when 300 individuals applied for 16 open positions and hit a low in 2022 when 120 individuals applied for 12 positions.

Recruitment efforts by Tucson-area fire departments have typically been passive in nature and consisted of posts on social media or word-of-mouth campaigns. While this still works to some degree, active recruiting is becoming more commonplace as more applicants are being sought and the pool of available employees is shrinking. This paper acknowledges the need for active, effective, and dynamic recruiting to increase applications by individuals looking to enter the fire service; however, the purpose of this paper is to identify additional barriers and roadblocks that may prevent individuals from applying to become a firefighter (Weaver, 2022).

Traditionally, individuals seeking employment with a fire department are typically expected to successfully complete one or more of the following testing requirements: some kind of physical fitness evaluation or the Candidate Physical Ability Test (CPAT), a written test, and one or more oral boards (International Association of Firefighters, 2007). Candidates who are successful in these stages are typically placed on a list to be hired and academies are taken from that list in numerical order as needed.

While written tests and oral boards provide an equal ground for all applicants, physical fitness tests conducted during a hiring process have been proven to favor males over females due to many factors including higher body mass and increased upper body strength (Heimburg et al., 2013). This could potentially reduce the number of women moving to the next phase of the hiring process and subsequently stifle the diversity of the fire department itself. Regardless of this possibility and the effects of such a barrier, efforts to remove a fitness requirement from the hiring process has been a challenge. Fundamental beliefs that a certain level of physical fitness is

required to be a successful recruit firefighter have resulted in these kinds of evaluations in the hiring process, and attempts to alter such minimum qualifications have sometimes been met with resistance from incumbent firefighters (Boyd et al., 2015).

Additionally, some fire agencies require applicants to have certain qualifications and certifications completed prior to applying. In the Tucson area, these certifications can be achieved by taking classes at the community college and can take from six months to one year to complete. This barrier places a time and financial burden on potential candidates by requiring them to have a certain level of education prior to applying for a position. Furthermore, despite having the required certifications, candidates still may not be successful in the hiring process or be hired on to the department at all (Moore, 2011). From the candidate's perspective, completing prerequisites without the guarantee of being hired could be risky and unappealing.

When compared with the private sector, Tucson-area fire departments may seem slow to respond to changes in the employment environment due to the bureaucratic structure of their organizations or deep roots in traditions that are somewhat resistant to change. However, this should not prevent them from seeking to gain information and acquire strategies from the private sector that could help increase their application numbers. Given the low unemployment rate and general strength of the current economy, competition for quality employees spans across all job fields. Businesses that are nimble and willing to change their hiring methods to meet the needs of prospective employees will be able to attract more applicants and maintain their staffing goals into the future (Weaver, 2022).

Staffing numbers are important for fire departments in the Tucson area and the communities they serve because the number of employees needed to adequately staff fire stations directly relates to the number of employees who are available to work. If there are not enough

firefighters to staff appropriately, the result is a decrease in the response capabilities of that department and subsequently a greater risk for the community exists when an emergency situation occurs (Fry et al., 2006).

Significance of the Study

The Executive Fire Officer Program Executive Development course lists desired program outcomes in its handbook for individuals who attend the class. One of these outcomes is to "strategically plan to foster a safe, healthy, prepared, and resilient community" another is to "exercise leadership to meet the technical and adaptive challenges within the organization and community" (U.S. Fire Administration [USFA], 2023, p. 2). Both of these desired outcomes can be achieved by increasing the number of individuals who apply for jobs in the fire service. Furthermore, both outcomes influence decision making which assists organizations to be better prepared for future planning when anticipating the need for hiring new firefighters.

To have a safe, healthy, prepared, and resilient community from the fire department's perspective, quality employees must be hired to either fill gaps in the current staffing matrix or to replace retiring firefighters as they leave the fire service. Because fire agencies are running academies more frequently than they have in the past to cover these staffing shortages, the need to effectively attract and hire new firefighters to maintain adequate staffing levels is paramount. While recruiting efforts are evolving to meet the needs of fire departments and potential applicants, the testing processes used for hiring has continued to remain relatively unchanged and therefore could present obstacles for the current generation looking to become firefighters. It is therefore necessary to simultaneously increase recruitment efforts and remove barriers to create a cohesive hiring approach and attract as many quality applicants as possible (Kubiak et al., 2023).

The second outcome recognizes the difference between the technical problem of needing to hire new firefighters as a short-term goal and the adaptive challenge of overhauling the new-hire testing process to make it more approachable by those looking to be hired in the future (Heifetz & Linsky, 2002). In the short term, it may be easy to create an effective recruitment that garners a lot of interest; however, in the long run, maintaining that level of interaction may be difficult if the entire system itself is not revamped.

Identifying barriers that potential applicants face and removing them so they can participate in the process would be the goal of this change. Looking to private businesses who have experience changing their hiring processes to meet the needs of individuals seeking employment in the current job market offers opportunities for fire departments striving for a creative alternative to update their traditional methods to something more modern. Seeking out new methods of hiring promotes fire departments to foster organizational environments that are, as stated in the 21st Century Fire and Emergency Services White Paper, "adaptable, open to change, innovative, and focused on continuous improvement" (Bruegman et al., 2020, p. 12).

Problem Statement

The problem is the number of applications by individuals looking to become firefighters has been steadily decreasing in the Tucson area over the past few years. Firefighter hiring processes have traditionally had many more individuals filling out applications and hoping to become firefighters than there have been open positions needing to be filled. This has allowed fire departments to put applicants through rigorous processes that focus on reducing the number of applicants early so the final number is manageable by the hiring entity (Dineen & Williamson, 2012). This usually includes a physical fitness test, a written test, and one or more oral

interviews (Hardison et al., 2015). Additionally, many fire departments require applicants to have firefighting and medical certifications prior to applying (Soni & Soni, 2016).

Requiring certain certifications prior to applying for a firefighter position places financial and time burdens on individuals seeking employment. Subsequently, one could earn all the minimum qualifications needed for the job but still end up not getting hired. With a history of difficult and competitive hiring processes, the time and cost it takes to get certifications without a guarantee of being hired could be a deterrent for individuals looking to apply (Soni & Soni, 2016).

Hiring processes that include physical tests, written tests, and oral boards are also time consuming and frequently require applicants to attend one or more phases of the process during the work week at some point in time (Hardison et al., 2015). This puts applicants in a position where they must take time away from their current job, if they have one, to participate in the fire department's scheduled process. This inconvenience could be a deciding factor for those who may not be able to take time away from work, especially if there is no guarantee of employment when the process is complete (Kyndt et al., 2009).

With many incumbent firefighters reaching retirement age, fire departments are having to hire in greater numbers than they have in the past (Chen, 2014). A reduction in the number of applicants results in fewer individuals for fire departments to choose from and some of those individuals may not be the best fit for a career in the fire service (Campion et al., 2019). If proper replacements are not hired at the numbers that are needed, adequate staffing and maintaining a well-trained workforce could be problems that arise in the future for fire organizations and the community they serve (Fry et al., 2006).

Purpose Statement

The purpose of this study will be to identify barriers in hiring processes that are preventing individuals from applying for a career in the fire service in the Tucson area. It will examine the reason for a decrease in the number of applicants for recruit firefighter and investigate alternate options for fire organizations to explore to both increase application numbers and attract quality individuals. Revamped hiring processes will hopefully create new options for fire agencies and inspire more individuals to apply for a career in the fire service. The study will use a qualitative approach, generic qualitative inquiry, and a semi-structured interview process to explore patterns and identify barriers that can be removed to subsequently assist Tucson-area fire departments in achieving higher application numbers (Creswell & Creswell, 2018).

Research Questions

1. What are the minimum qualifications for individuals to apply for the position of firefighter at Tucson-area fire agencies, and why?
2. What are the different parts that make up hiring processes in Tucson-area fire agencies, and how do they differ from hiring processes in the private sector?
3. Which parts of fire agencies' hiring processes may produce barriers, and can they be modified or eliminated to reduce those obstacles and increase the number of applicants?

Summary

Chapter 1 provided an introduction of Tucson, Arizona, discussed some of the fire service agencies in the area, and described how the number of applicants seeking employment in those agencies has decreased over the past few years. It described the purpose and method to be used in this paper and identified research questions from which to build upon. Moving forward,

Chapter 2 will provide an overview of existing literature on hiring processes in both the fire service and the private sector and contrast their differences. Chapter 3 will explain the methodology used to conduct the research of this study and explain the findings.

CHAPTER 2: LITERATURE REVIEW

Introduction

This chapter provides a detailed account of existing literature reviewed for this research project. Sources of this literature include demographic data, fire industry publications, and academic research related to the fire service and private businesses. The literature review begins with an overview of the stages of a hiring process commonly used by fire departments then compares those findings with the stages of hiring processes found in the private sector. The review then breaks down the phases of the fire service hiring process to examine their effectiveness in determining if an individual will become a successful firefighter. It then examines those phases and explores the possibility of barriers existing that could prevent individuals from successfully completing, or even beginning, the process. The review then provides insight taken from literature about private business hiring processes to explore options for fire departments moving forward to adjust their methods in a way that meets the needs of their organization and applicants.

Existing Literature

A literature review was conducted to gain a better understanding of how fire departments have traditionally conducted their hiring processes, identify barriers that potential applicants may face during that process, and investigate possibilities to improve the process by using current technology and other means. A total of 25 references were reviewed in support of the initial literature review effort. The literature has been divided into three categories which address fire department hiring history, barriers applicants may face during the hiring process, and current trends that private businesses are using in their hiring processes. The literature chosen for review includes 18 peer-reviewed scholarly academic articles, 9 of which were published in the last five

years. Additionally, information was taken from two applied research projects completed by Executive Fire Officers who examined various aspects of the hiring process within their own organizations. These papers have not been peer reviewed; however, they offer information which allows for an industry perspective from the view of other executive officers.

The literature review of fire department hiring processes began with a search of scholarly articles which are available online through the National Emergency Training Center Library and the Elton B. Stevens Company (EBSCO) Database via Columbia Southern University. Additional information was gained through Internet searches for articles and publications on Google Scholar. Eight search phrases were used for articles in this literature review: Firefighter Hiring Processes; Firefighter Recruitment; Google Hiring Processes; Hiring Barriers for Firefighters; Employee Selection; Artificial Intelligence; Employment Changes; and Recruitment Challenges. Themes from these search phrases offered a baseline for the literature review and information used throughout this study.

Fire Department Hiring

An analysis of the Los Angeles Fire Department's comprehensive study on their recruiting and hiring of firefighters conducted in 2013 demonstrates how traditional processes are typically carried out by many fire departments across the country (Hardison, et al., 2015). It also identified areas of improvement that can be expounded upon to increase the number of applicants and the diversity of the applicant pool. In this study, the Los Angeles Fire Department (LAFD) used a 10-stage Selection Process to reach their final decision for recruit candidates: Preliminary Background Application; Minimum Requirements; Written Test; Candidate Physical Ability Test (CPAT); Oral Interview; Background Investigation; Initial Panel Review; Field Investigation; Final Panel Review; and Medical and Psychological Exams.

While fire departments in the Tucson area may not use the same exact process, similarities with the LAFD's process exist to the point where local applicants can expect a physical fitness component, written tests, and oral interviews. In addition, some of the smaller departments in the region require state-certified fire and emergency medical service (EMS) certifications as prerequisites for being hired. Certification requirements as minimum qualifications are generally due to a lack of funding by smaller departments to pay for such education in a fire academy setting. In these cases, applicants shoulder most of the burden for their own fire service training prior to being hired (Soni & Soni, 2016).

Each stage of the fire department hiring process is designed to measure different qualities of an individual and predict their likelihood of becoming a successful firefighter. The written test measures the cognitive and mechanical abilities of an individual and the fitness test measures the ability to perform the physical demands of firefighting in a variety of working conditions (Barrett et al., 1999; Beitia et al., 2022). Oral interviews are conducted to determine if individuals are a good fit for the department and to verify their ability to communicate during a face-to-face interaction (Hardison et al., 2015). These processes are often very similar from one department to the next, rarely change, and can take anywhere from 6-12 months from the time of posted notice to the time that offers of employment are extended to applicants.

Private Sector Hiring

Considering the 10-stage Selection Process provided by LAFD and comparing it with the hiring processes of businesses in the private sector, there are differences which separate the two. Rather than 10 stages, private businesses utilize variations of a 5-stage selection process for new employees: Application Form; Resume; Interview; Selection Tests; and Verification of References and Recommendations (Dominique-Ferreira et al., 2022). Faced with an increasingly

competitive labor market, private businesses have been able to adjust their hiring processes to meet the needs of their company (and the applicants they are seeking) by reducing the number of stages involved in the process and capitalizing on recent technology. These changes were made to shorten the length of hiring processes, streamline decision making, and make applying for a position more accessible to job seekers regardless of their location (Martins et al., 2022).

Digital media has been added to private sector hiring processes, and those platforms are able to collect information and analyze metrics on a variety of factors which then matches candidates and their skillset to the appropriate position in which they are most likely to be successful (Martins et al., 2022). This streamlined process focuses the efforts of businesses on getting the right person for the right job and subsequently produces a better candidate at a reduced cost to find them (Alexander et al., 2019).

Because private companies can adjust their hiring processes to meet the needs of the current pool of potential employees, they hold an advantage over Tucson-area fire departments who continue to use the same hiring methods as they have for years. These fire departments continue to function as if the number of applicants wishing to obtain employment remains significantly greater than the number of open positions needing to be filled. In the past, recruiting efforts were, sometimes inadvertently, focused on accumulating a large number of candidates and recruiting success was defined by how many candidates fire departments attracted (Dineen & Williamson, 2012). “The problem is that some candidates have little chance of being selected, thus creating a quality-quantity dilemma for organizations” (Campion et al., 2019, p. 1089). This dilemma motivated the development of the traditional hiring process found in Tucson today. However, with fewer people applying to become firefighters, certain aspects of the process which previously eliminated many potentially qualified candidates should be examined for their

relevance in the current economic environment as their removal or modification could increase application numbers once again.

Written Tests

Written tests that evaluate an individual's capacity to perform the tasks of the job they are applying for are used as a tool to improve outcomes for both organizations and the applicant (Campion et al., 2019). As noted previously in this paper, both private businesses and Tucson-area fire departments use some form of written test to reduce the applicant pool down to individuals who possess desired aptitude qualities for the position to be filled. For employers, selection tests can be useful predictors of an employee's future performance and reveal the desired characteristics they are looking for (Highhouse & Rada, 2015). For Tucson-area fire departments in particular, written tests designed to measure cognitive and mechanical ability improve the likelihood of hiring quality individuals "who are able to perform the critical job duties of firefighters during fires, hazards, and other life-threatening events" (Barrett et al., 1999, p. 507).

Given the usefulness of written tests and their likelihood of producing quality candidates in both private businesses and Tucson-area fire departments, other aspects of fire department hiring processes must be examined to determine if they continue to be relevant or produce any form of barrier for applicants. One notable difference between fire departments and private businesses is the requirement to successfully pass a physical ability test. Because the greatest number of candidates are typically lost by failing the written test or the physical ability test, and the written test has proven to be a useful predictor of future performance, the physical ability test, its performance predictions, and barriers it may create must be examined (Hardison et al., 2015).

Physical Ability Tests

The Candidate Physical Ability Test (CPAT) was developed by the International Association of Firefighters and consists of 8 stations that simulate physical events or activities that are commonly done by firefighters. These events include a stair climb, hose drag, equipment carry, ladder raise and extension, forcible entry, search, rescue, and ceiling breach and pull. A weighted vest is worn throughout the evolution and all events must be completed in under 10 minutes and 20 seconds for the candidate to successfully pass (International Association of Fire Fighters [IAFF], 2007). The CPAT has been validated as a reliable test of physical ability; however, criticism of the CPAT argues that the test emphasizes strength over aerobic capacity and therefore adversely affects women who have a statistically lower passing rate than men (Hulett et al., 2013).

If CPAT failure rates are greater among women than men and this is well-known among potential candidates, the resulting outcome could be fewer female applicants and subsequently fewer female firefighters. Awareness of the difficulty to successfully pass the test could be a potential deterrent for women looking to apply. Subsequently, a barrier such as this may be a factor which influences the statistic that only 9% of career firefighters are female (Fahy et al., 2022). On a more global scale, however, the ability for people to take a CPAT may also be a limiting factor in their ability to participate in a hiring process.

The financial and personnel requirements to build, maintain, and host an officially licensed CPAT are too great for many fire departments. Therefore, it is not uncommon for fire departments who require the CPAT as a part of their hiring process to outsource the test and accept certifications given by other agencies or private businesses. In the state of Arizona, there is only one test site (outside of those maintained by departments) that hosts the CPAT, and a fee

is charged for this service (National Testing Network, n.d.). This places the responsibility of seeking out, finding, scheduling, training for, paying for, and potentially driving to a licensed CPAT location on the potential candidate. All of this is done to meet the minimum requirements for the job with no guarantee of employment.

Despite CPAT success rate of 96% by candidates who can take it, the time and financial burden placed on applicants to complete the test creates a barrier that may not be necessary (Hardison et al., 2015). Studies have shown that passing the CPAT is not as large a factor in the overall success of a recruit firefighter as would be expected given the weight of its "pass or fail" score as a minimum requirement for the job (Fyock-Martin et al., 2020). As mentioned earlier in this paper, fire departments have utilized various methods to reduce the number of applications to a manageable amount when hiring recruit firefighters and the CPAT is one of those methods.

Although the pass rate for the CPAT is high and the physical requirements themselves may not be enough to eliminate a substantial number of candidates, the difficulty of obtaining the test may be enough of a barrier to reduce the overall number of applicants (Zumbo, 2016). While this effect was desirable in years past, current trends and hiring difficulties which are seen across several industries may be exacerbated in the fire service field specifically because fire departments are reluctant to change away from the CPAT requirement (Weaver, 2022; Hurd, 2015). Moreover, hiring processes cannot disproportionately disadvantage members from any group; therefore, the perception of bias based on greater opportunity to take (and pass) a CPAT by men compared to women threatens the validity of the entire process (Trindel et al., 2020).

Furthermore, successful completion of the CPAT does not inherently guarantee the individual will be a good firefighter. As Michaelides et al. (2011) states, "fitness parameters used along prediction models are not sufficient to fully predict a firefighter's job performance, they

only demonstrate the individual can perform firefighter-like skills in a controlled setting" (p. 964). Firefighting is fundamentally dynamic and physically challenging at times, and high fitness levels have shown to enhance job performance and decrease injuries; however, the need to prove adequate physical fitness levels prior to entering the profession should be studied (McKendrick, 2001). This is particularly true if the test creates any form of barrier for otherwise qualified applicants and if an academy with a formalized fitness program is offered to recruits (Beitia et al., 2022).

Since recruits typically participate in fitness programs while attending the academy, desired levels of fitness required for the job can be achieved during that time (Müller-Schilling et al., 2019). Rather than make the CPAT a requirement for being hired, focus could be switched to educate incumbent firefighters who would benefit from continuing physical fitness training since "many are not required to maintain minimum physical capacities or follow a regular exercise routine" (Michaelides et al., 2011, p. 956). If a certain level of physical fitness ability is required to get hired but not expected after being hired, the true purpose and usefulness of the test must be examined especially if that test creates barriers for individuals to apply in the first place.

Technology in Hiring

Further reducing barriers that applicants may face during a hiring process could be achieved by taking advantage of technology which allows candidates to take written tests and participate in interviews on their own time (Morelli et al., 2014). Modern job applicants are comfortable with preemployment tests given on internet-abled devices and these changes have made it easier for hiring organizations to administer tests for the purpose of selecting appropriate candidates (Brown et al., 2023). This process has been successfully used in the private sector and has become an efficient system where candidates are screened by testing software before

progressing on to the next stage. This digital process can accommodate large recruiting numbers and appropriate candidates are separated from those who are unsuccessful prior to any face-to-face interaction with actual individuals from the hiring organization (Newman & Ross, 2014).

Mobile-friendly technology can also be used for interviews. Software platforms exist where candidates record their answers to prepared questions using the camera on their smartphone or computer. The hiring organization is then able to view those recorded answers at a later time which is convenient for them (Newman & Ross, 2014). This benefits the candidate by providing them with a way to participate in the hiring process on their own schedule, and the hiring organization by minimizing the budgetary constraints a large number of in-person interviews can create. When used correctly, a mobile-friendly written test and mobile-friendly interview process would provide an organization with a way to recruit large numbers of applicants, glean the best candidates for a position, and never have in-person interaction with them until the final interview.

Synthesis of the Existing Literature

Existing literature has demonstrated the importance of a testing process for applicants looking to become firefighters in the Tucson area. These processes benefit organizations and individuals by separating those candidates who are likely to become successful firefighters from those who are not (Hardison et al., 2015). Recent trends have shown a decrease in the number of applications for the job of firefighter which results in fewer individuals to choose from and decreases the likelihood that worthwhile candidates will be found (Kyndt et al., 2009). As such, an exploration of the qualifications needed to apply for the position, and the methods used during the process were examined. Given the hiring processes for Tucson-area fire departments has

remained relatively unchanged for the past several years, a comparison of those and ones in the private sector were considered.

Overall, written tests that measure an individual's aptitude to become a firefighter are valuable and appropriate (Highhouse & Rada, 2015). They provide a useful tool for testing many individuals and assist organizations by decreasing the overall number of applications down to those individuals with the most potential for success. Mobile-friendly testing platforms make this process even more accessible for candidates, which then has the potential to increase application numbers, and therefore the likelihood of identifying ideal recruits (Morelli et al., 2014). This method has been used in the private sector and meets the expectations of today's job seekers; therefore, adding a mobile-friendly component to a fire department's testing process can be beneficial and cost-effective (Newman & Ross, 2014).

One requirement which is particular to the fire service, and Tucson-area fire departments, is the physical fitness component of the hiring process (i.e., the CPAT). Literature supports the need for adequate strength and fitness levels to be a firefighter. However, whether that training occurs before or during an academy and the correlation of passing the CPAT and an applicant becoming a successful firefighter should be explored (Michaelides et al., 2011).

Literature also supports barriers created by the CPAT may hinder female candidates more than males (Hulett et al., 2013). Additionally, the scarcity of testing sites, and subsequent fees associated with them, could create other barriers which deter or prevent potential applicants of both genders from applying in the first place (Zumbo, 2016). If recruitment numbers are low, considering the removal of the CPAT may be a way to increase interest and generate larger numbers of applicants (Wilcox, 2018)

Summary

The purpose of this literature review was to obtain the most current information related to traditional fire department hiring processes, identify areas that can be changed to increase applicant numbers, and explore new technologies that can be implemented to improve the processes moving forward.

This research study helps combine academic literature regarding traditional fire department hiring processes while considering barriers that may impede individuals from applying for open positions. By using technology to modernize potentially outdated forms of testing and combining best practices from public and private sectors, fire departments could increase their recruitment numbers while improving the quality of the experience for organizations and candidates alike.

CHAPTER 3: METHODOLOGY

This chapter summarizes the methodology used to conduct and structure the research effort of this study. Initial research began with identifying the topic by finding a purpose statement and problem statements regarding traditional fire department hiring processes and a decrease in the number of applicants who are applying to become firefighters in the Tucson area.

A literature review explaining traditional hiring processes, identifying possible barriers for individuals who may want to apply for employment, and examining new technologies that could assist organizations increase recruitment numbers and successful hiring then followed. This review utilized Applied Research Projects from the National Emergency Training Center Library and searches on the Columbia Southern University online library system to obtain scholarly articles of existing literature on these topics. Key search phrases that were used which provided the best results were: firefighting employment; exercise test methods; employee recruitment; employment discrimination; employee selection methods; and technology in hiring.

Existing literature demonstrated potential barriers created by traditional firefighter hiring processes and identified avenues to improve recruitment numbers by removing those barriers and modernizing the methods currently used. The next portion of this research study was to assess the hiring processes used by Tucson-area fire departments and evaluate areas where improvements could be made to increase recruitment numbers within those agencies. The research design establishes criteria for the sample agencies used and separates those organizations from others in the region which do not meet similar research qualifications.

Research Design

To assess the hiring processes used by Tucson-area fire departments and identify any barriers that may result in lower recruitment numbers, a qualitive research design that makes

interpretations of data based on information provided through open-ended interviews was chosen for this project. This method was selected due to its ability to collect information from Tucson-area fire departments and examine their similarities and differences by using a semi-structured interview process with specific questions while maintaining the ability to explore answers deeper should the need arise.

Sample participants for this study are the hiring managers of each organization chosen for this project. Conducting interviews with hiring managers of fire organizations is the foundation of this research study because they are the subject matter specialists within each organization when it comes to the details, history, and effectiveness of their hiring processes. Asking research participants semi-structured questions that promote open-ended answers is a qualitative research approach. Gathering data in this manner allows for the exploration and understanding of the answers that will be given and provides structure for a written report that is flexible in nature (Creswell et al., 2018). There is no numerical data to be analyzed and no hypothesis to prove or disprove; therefore, although considered, both quantitative and mixed methods approaches were deemed not to be appropriate for this research study and were eliminated.

The qualitative approach can be broad; therefore, there are several research designs within its scope that offer more focused approaches. Within the spectrum of potential approaches which can be used, Kostere and Kostere (2021) offer a research design which best fits the overall goal of this project: Generic Qualitative Inquiry. Because Generic Qualitative Inquiry examines topics relevant to real-world issues or situations, it provides the design best suited to investigate the perspectives of fire department hiring managers about their hiring processes and any barriers they feel may exist.

Generic Qualitative Inquiry is challenging for researchers because it potentially lacks the academic rigor present in other approaches. This requires the researcher to approach their design and processes in a way that eliminates preconceived notions or assumptions. It is also essential that the data collected through the interviews is the source which provides the information that drives the study results (Kostere & Kostere, 2021).

The research approach (qualitative), the research design (generic qualitative), and the procedure (semi-structured interviews) have been established as the design of this project. Kostere and Kostere (2021) describe the next step in the process as selecting the method of analyzing the data which is collected. For purposes of this paper, there are three types of Thematic Analysis which are to be considered: Inductive, Theoretical, or Constant. For this project, Thematic Analysis is the appropriate choice because it allows for examination of interviews while focusing on the elimination of any pre-understandings or pre-suppositions. This allows for a deeper understanding of information provided by interviewees and fosters a better understanding of each organization's hiring strategies and challenges.

Theoretical Analysis and Constant Comparison were determined to be inappropriate analysis methods for this study because both use some form of pre-existing information to be collected, analyzed, and compared. Findings from this study are unique to fire service organizations in the Tucson region; therefore, data which is collected through the interview process should be analyzed with an open mind which allows for information to guide findings as opposed to preconceived assumptions.

Population and Sample Size

As discussed earlier in this research project, the Tucson region has several fire departments and districts. Sizes of these organizations range from a one-station fire district that

serves a small population in a rural area to a large fire department with 22 stations that serves a mostly urban population of over 540,000 residents. For purposes of this research project, consideration was given to fire departments that hold formalized fire academies to be considered as sample organizations relevant to the research questions created. There are seven fire departments in the Tucson region that meet these qualifications. Upon further review, two of these departments are slightly different from the others which removes them from consideration because their hiring models may not be consistent with the other agencies and subsequently may provide data which is outside the parameters of the research project.

One of these departments is a for-profit organization with a reserve program that it uses for hiring firefighters. The other department is tribally owned and hires individuals primarily from within the tribe it serves as opposed to looking outside for potential candidates. The other five organizations are tax-based governmental entities that have established histories of holding open hiring processes and formalized academies. In efforts to obtain data from like agencies, these five departments were chosen as the sample organizations for this project based on their size, hiring processes, and ability to hold formalized academies for new hires.

This design serves the purpose of clearly defining the target sample group of agencies to include in the research project and maintains a level of consistency across organizations (Kostere & Kostere, 2022). To be considered for this research project, departments must hold traditional hiring processes and provide training during a formalized academy. To maintain this consistency, the two Tucson-area fire departments that do not meet these conditions were eliminated from consideration for this project. Based on these criteria, five Tucson-area fire departments were approached for this research project, and all chose to participate. The sample organizations are as follows:

1. The Golder Ranch Fire District is a career fire district that employs 236 suppression firefighters who operate out of 10 stations. The Golder Ranch Fire District covers 238 square miles and serves a population of approximately 97,101 people (Golder Ranch Fire District, n.d.) The district borders Northwest Fire District boundaries to the west and Tucson Fire Department boundaries to the south. The Golder Ranch Fire District holds hiring processes and formalized academies.
2. The Northwest Fire District is a career fire district that employs 226 suppression firefighters who operate out of 11 stations. The Northwest Fire District covers 156 square miles and serves a population of 133,015 people (Northwest Fire District, n.d.) The district borders Golder Ranch Fire District to the east and Tucson Fire Department to the south. The Northwest Fire District holds hiring processes and formalized academies.
3. The Tucson Fire Department is a career fire department that employs nearly 600 suppression firefighters who operate out of 22 stations. The Tucson Fire Department serves a population of 542,649 people (City of Tucson, n.d.). The department borders Golder Ranch Fire District and Northwest Fire District to the north. The Tucson Fire Department holds hiring processes and formalized academies.
4. The Green Valley Fire District is a career fire district that employs nearly 60 suppression firefighters who operate out of four stations. The Green Valley Fire District serves a population of approximately 35,000 people (Green Valley Fire District, n.d.). The district is located 30 miles south of Tucson. The Green Valley Fire District holds hiring processes and formalized academies.

5. The Drexel Heights Fire District is a career fire district that employs nearly 80 suppression firefighters who operate out of six stations. The Drexel Heights Fire District serves a population of approximately 50,000 people (Drexel Heights Fire District, n.d.). The district is located 11 miles southwest of Tucson. The Drexel Heights Fire District holds hiring processes and formalized academies.

Instruments

A combination of instruments was used to conduct research for this project. The tools used consisted of a survey with a questionnaire and an interview. The survey was sent via email and used to initiate contact with the selected organization, see if they are willing to participate in the project, and identify who would be the appropriate person to act as the subject matter specialist regarding their hiring process for new firefighters. See Appendix A for an example of the initial survey used.

The interview focused on information provided by the hiring manager or person in charge of hiring for each agency and served as the second instrument while maintaining the semi-structured, generic-qualitative-inquiry nature of the research process. Creswell and Creswell (2018) provide a list of components that should be included in an interview protocol. This list guided the development of the interview protocol used for this project and included an introduction, an opportunity to build rapport, and a question-and-answer session.

Interviews were conducted via video conference software with a recording feature that allowed for analysis to be completed later. This method was chosen because of its ability to have face-to-face interaction on a schedule that worked for all parties without the need to travel. The participants' familiarity with the video conferencing program allowed for quick and efficient conversations to occur (Rosala, 2020).

Research Process

The surveys were initially created to develop a base of information about each organization's recruitment and hiring process for new firefighters. This included minimum qualifications and certifications (if any), and the stages an applicant must go through to be successful in the hiring process. The surveys were sent out electronically to the human resources department of each organization via Survey Monkey and asked to be forwarded to the most appropriate person to assist with the questions.

The survey questions were field tested by various fire service professionals from fire departments not included in the study. These professionals reviewed the survey and subsequent interview questions to ensure they would maintain the intent of the project and capture the information being sought out. They also verified that the questions were easily interpreted and understood by survey takers and interviewees so that the answers provided demonstrated an understanding of the concepts of this research study (Crick, 2021).

Interview participants were selected because they were subject matter specialists from the five fire departments chosen for this study. After the initial email was sent, contact information for the correct person was given to the researcher and communication was initiated. If the person who received the initial email was indeed the correct person for the study, no additional outreach was necessary.

Maintaining a semi-structured interview process that encouraged the interviewees to elaborate on their answers to the research questions was essential for gaining perspective of each agency's hiring processes and challenges. Conducting the interviews in this way allowed for direct answers to each question with flexibility to understand each organization's reasons for conducting their processes the way they do. To this end, finding information on the research

questions was straightforward and easy to document; however, extracting the necessary data points from more conversational parts of the interviews was challenging.

As a result, it was decided that conversational portions of the interviews served the necessary purpose of building rapport between the interviewer and interviewee and answers to the researcher's questions would be the focus of the discussion (Platt, 2012). If a specific answer needed to be explored more deeply, follow up questions from the researcher would be asked until the response was clarified (Kostere & Kostere, 2022).

Inductive analysis was carried out following specific steps detailed by Kostere and Kostere (2022). Although in-depth coding was not necessary due to the straightforward nature of the interview questions, answers were documented and analyzed for any patterns that could be identified and grouped together. Steps of inductive analysis include:

1. Gather all data collected from the first participant and review it for familiarity and to highlight any portion that stands out as meaningful.
2. Review the highlighted data and compare it to the research questions to determine if it is directly related to the research question.
3. Set aside, but retain, any material not directly related to the research question as it may be re-evaluated or used in other ways later.
4. Data found to be directly related to the research question are labeled "meaning units", which are typically a direct quote from a participant's answer.
5. Create groupings of meaning units that are related. This begins the process of identifying patterns within the data.

6. As each pattern is identified, the relevant meaning units are listed under the pattern. Review the direct quotes within each meaning unit to make sure the pattern grouping makes sense.
7. Summarize each pattern with supporting quotes from the interview and write a brief synopsis of the pattern and its relationship to the research questions.
8. Once the process is complete for the first participant's data, examine all patterns together to identify emerging themes. Combine the related patterns under each theme.
9. Arrange the themes and their underlying patterns, ensuring that each pattern is supported by direct quotes from the participant.
10. Develop a detailed analysis of the scope and substance from each theme.
11. This same process is repeated for each individual participant's data.
12. Once data analysis for all participants is complete, themes and patterns are combined into a composite synthesis looking for broad meanings and implications related to the research question.

One final step was carried out which assisted in validating the results of the data analysis and served to share the results with the interviewees. Kostere and Kostere (2022) refer to this process as "member checking" and it allows the researcher to follow up again with each participant with findings of the research and collect any feedback that may be provided. This feedback serves as more data to support the study, ensures reliability, and provides insight of the findings to interviewees who participated.

Ethical Considerations

Ensuring the confidentiality of research participants and their privacy during the interview process is essential to gather information that is truthful and honest. This begins by

informing the interviewees of the steps that will be taken by the researcher during the process to ensure confidentiality and maintain the trust of the participants. Several steps which include multiple layers of protection should be taken to achieve this goal (Kostere & Kostere, 2022). Specific protections were developed for this study, thereby building appropriate protections for each step of the interviews which form the foundation of this research.

First, all email communications with the study participants were encrypted to prevent unwanted access. All digital files and folders associated with the study were saved in the researcher's private drive and password protected. Recordings that were made during video interviews were also password protected and stored on the private drive. Additionally, the number of individuals who were allowed to participate in the video interview was monitored by the researcher and limited to one at a time. This ensured confidentiality and allowed for private conversations to occur despite being in two locations and conducting the interviews over video conferencing software.

Finally, any hard-copy materials collected during the interview process were scanned into digital format, password protected, and saved in the private drive. This included transcripts from the video interviews and any printouts used by the researcher to manually organize answers and information.

These practices follow standards of confidentiality that are the foundation of the research process of the Executive Fire Officer Program (USFA, 2023). The Publication of the American Psychological Association (APA, 2020) sets ethical standards for researchers to abide by in their work including what is expected of participants, how information will be collected, and developing a plan to maintain confidentiality throughout the study. Additionally, to remove any

potential for bias on the part of the researcher or interviewee, all participants received the same treatment and were asked the same interview questions (Creswell et al., 2018).

Summary

In this chapter, an overview of the research process summarizing the methodology chosen to examine how Tucson-area fire departments conduct their hiring processes was provided. The study included information from five fire departments provided through a semi-structured, generic-qualitative-inquiry interview process with hiring managers from each agency. Interviews were conducted remotely and online via Zoom software and transcripts from the conversations were transcribed and reviewed for information relating to the research questions.

The responses provided insight into the hiring processes for each organization and identified similarities, differences, and potential barriers that applicants may face. This information, along with information obtained from the literature review, helped to create an understanding of challenges that are faced by fire departments with their hiring processes, most notably if they have not been updated in a while.

CHAPTER 4: STUDY RESULTS

Introduction

This qualitative study aimed to assess the hiring processes of Tucson-area fire departments and determine if stages in those processes affect the number of individuals applying for the position of recruit firefighter. The primary purpose of this study was to investigate if applicants face barriers which prevent them from applying. It also examined to what extent technology was used in hiring processes and if opportunities exist to better utilize new techniques of attracting individuals to employment opportunities.

Demographics of the Participants

The five participants in this study were females ranging in age from 29-56 years old. They are members of the human resources departments for their respective organizations, and each has full-time members of suppression firefighters help with their hiring processes. Participants were chosen because their organizations represent the five largest fire departments in the Tucson area, they hire frequently, and they hold academies to train their recruit firefighters. Regional specificity and shared department characteristics make the number of departments included in this study sufficient to address the research questions previously introduced (Creswell et al, 2018). Additional demographics of the participants were addressed in interview questions one and two.

Each interviewee is actively involved in their department's hiring process for recruit firefighters and these individuals were selected as the most appropriate person to assist in the research project based on answers received from a brief survey sent out to each agency. The survey platform used was Survey Monkey with questions included in Appendix A. Interviews using a semi-structured interview guide were conducted via Zoom and recorded. The researcher

cleansed the interviews and created a transcript that was reviewed to identify responses and themes that addressed the research questions stated earlier in this paper.

Research Results

Interview Question Number 1:

How long have you been with your department?

Summary of Results:

The five participants have been with their respective departments for years ranging from four to 12. Three of them have under 10 years (Interviewees No. 1, 2, and 4) and two have 10 years or more (Interviewees No. 3 and 5).

Interview Question Number 2:

How many recruit firefighter hiring processes have you been involved in?

Summary of Results:

The number of recruit firefighter hiring processes interviewees have been involved in ranges from six to 12. Interviewee No. 1 has been involved in six hiring processes. Interviewee No. 2 has been involved in seven hiring processes. Interviewee No. 3 has been involved in 10 hiring processes. Interviewee No. 4 has been involved in nine hiring processes. Interviewee No. 5 has been involved in 12 hiring processes.

Interview Question Number 3:

Please explain your recruitment process for new firefighters (if any).

Summary of Results:

Recruitment teams from each department attend high school and community college career fairs. The community college has a fire service program that many current firefighters teach at, and those instructors actively seek out students they feel would be successful

firefighters and encourage them to apply at their organization. Each department also relies on their own firefighters to seek out individuals they feel would be a good employee and recruit them on an informal basis.

Interview Question Number 4:

How do you advertise that you are hiring?

Summary of Results:

Interviewees stated social media was the largest form of advertising for recruitment purposes followed by professional job-search websites. Instagram is the most successful media platform used by the departments. Facebook is the next most successful but follows far behind Instagram in popularity. Media coverage exists but only for the larger departments. Each department also relies heavily on word-of-mouth and encourages current firefighters to seek out and find individuals who they think would be a good fit for their department to apply.

Interview Question Number 5:

Do you use any new technology in your hiring process? If so, what would that be?

Summary of Results:

Two agencies utilize mobile software platforms for their application process, written test, and first interview. These platforms allow individuals to apply, take the written test, and participate in the first round of interviews where and when it is convenient for them. Those same agencies use a credibility test which examines applicants' truthfulness by observing and measuring changes in pupil diameter while answering questions. The other three departments do not use any mobile software platforms or credibility tests.

Interview Question Number 6:

How often do you hold recruit academies?

Summary of Results:

Answers to this question varied from two per year to four per year, depending on the need of the department. This need is determined by staffing levels which are influenced by growth, attrition, or a combination of the two. Three departments have held two academies per year for the past three years or more. One department has had three per year for the past two years. One department has an open recruitment process and holds an academy whenever an adequate number of recruits has been established. This method results in up to four academies per year.

Interview Question Number 7:

Have you seen a change in the number of applicants over the past few years? If so, what changes have you noticed?

Summary of Results:

All interviewees stated that they have seen the number of applicants change over the past few years. For the most part, they feel it is harder to get people to apply to become firefighters; however, COVID-19 appears to have had the greatest impact on application numbers. During that event, numbers increased slightly for each agency. This spike was short-lived and since then the largest department in the region has seen a drastic decrease in their numbers where applications have dropped from 1890 to 140.

The other departments in this study have remained stable or decreased only slightly. The number of applications varied between agencies from 20 to 570. One department always accepts applications and runs academies when the class has been filled with appropriate candidates. This

is different from the other four departments where recruitment and hiring windows are set amounts of time.

Interview Question Number 8:

What are the minimum qualifications needed to apply for the position of firefighter in your organization?

Summary of Results:

Two departments interviewed require Arizona State fire certifications (Fire I and Fire II), emergency medical services certifications (Emergency Medical Technician [EMT] or Certified Emergency Paramedic [CEP]), wildland certification, and hazardous materials certification. They also require the candidate to be 18 years old, have a valid driver's license, and possess a high school diploma or General Education Development certificate (GED).

Three departments require the candidate to be 18 years old, have a valid driver's license, and possess a high school diploma or GED. In the event of an urgent hiring need, one of these departments alters their requirements to include all certifications as minimum qualifications. This is done when staffing is critically low to reduce the amount of time spent in the academy so new hires can enter the field more quickly.

Interview Question Number 9:

Do you perceive any barriers that may prevent people from applying to be a firefighter in your department? If so, what do you think those may be?

Summary of Results:

Each interviewee reported they feel as though no barriers exist which may prevent people from applying for their department. One interviewee stated they felt candidates could potentially

be intimidated by computer testing programs used for the written test. That department has since changed to a paper test for their written portion of the hiring process.

Interview Question Number 10:

Do you require some sort of physical ability test? If so, what do you use and what is the pass/fail rate?

Summary of Results:

Four Tucson-area fire departments require the candidate to pass a physical ability test during the hiring process. Two of the agencies use a self-monitored CPAT and two others use their own physical ability test which is based on the CPAT. One agency previously required the CPAT but has recently not used any physical ability test during their hiring processes. The CPAT is monitored by firefighters trained in proctoring it. The other physical ability test is proctored by the departments' physician (the physician is the same for both departments).

Fail rates for the CPAT are estimated at around 40% for both agencies that use it as a stage of the hiring process. Of the 40%, it was estimated by the interviewees that the failure rate was equal between males and females. The agencies which use their own physical ability test utilize the same testing site through an intergovernmental agreement. Failure rates are estimated at around 5%. No females have failed this test; however, only one has taken it.

Interview Question Number 11:

Please explain the steps of a hiring process (i.e., written exam, interview, etc.).

Summary of Results:

Steps for the hiring processes varied between departments and none of them were the same. To move through the process, all candidates need to successfully pass each step along the way. For all departments, a failure at any point removes a candidate from the process. All

departments had an application process followed by a written test. Three departments have an aptitude-based written test. The other two departments have tests that focus on behavioral and cognitive traits. Four departments require a physical ability test (two CPAT, two department-specific physical ability tests). One department does not require a physical ability test.

Two departments then hold in-person interviews with the candidates and a selection is made for the academy at that point. Two other departments utilize a mobile software platform to administer and assess their first round of interviews. A second, in-person interview will be held later. One department conducts their first round of interviews in person, but final selection is made after a second interview (also in person).

Two departments use a credibility test prior to the final interview and selection process. Candidates who score poorly on the credibility test can discuss their scores during the final interview. One department selects its candidates at this point, the other department finishes their process by conducting a psychological test of the applicant. Final decisions for this department are made after a successful psychological test.

Interview Question Number 12:

How long are recruit academies, and what do you teach in them?

Summary of Results:

Academy lengths varied from two weeks to 26 weeks, depending on the type of academy and material to be learned. One department does not deviate from their 26-week academy which includes all fire and EMS certifications. All recruits are required to receive this training regardless of whether they possess the certification or not. Another department has the same philosophy, although their academies are 18 weeks long.

The other three departments have academies lasting from two to 16 weeks depending on the training needed by recruits. Departments that require fire and EMS certifications as minimum qualifications to be hired are flexible in the lengths of their academies and vary their academies based on the experience of the applicants. A two-week academy is used if recruits have more than five years' experience and a four-week academy is used if recruits have less than five years' experience. All firefighters must possess State of Arizona certifications for fire and EMS regardless of where they were earned (i.e., academy, community college, private agency).

Interview Question Number 13:

Do you have physical training (PT) in the academy? If so, how often?

Summary of Results:

Each organization holds daily PT during their academies.

Interview Question Number 14:

Are there any certifications earned during the academy (i.e., Fire I and II, EMT)?

Summary of Results:

Three organizations provide certifications during their academies. These include state certifications for firefighting, wildland, HAZMAT, and EMT. Academy recruits may not need these certifications because they already possess them; however, they attend all academy training nonetheless to validate competency and refresh their skills.

Two organizations do not provide certifications in their academies and instead require those same certifications as minimum qualifications for being hired. Application numbers are significantly lower for departments that require certifications as minimum qualifications.

Interview Question Number 15:

If you could make any recommendations on how to improve the hiring process, what would they be?

Summary of Results:

Interviewees were given an opportunity to offer recommendations on how they felt their hiring processes could be improved. Responses were limited but revolved around two concepts: removing favoritism by individuals grading candidates during the hiring process so acquaintances of current employees do not receive preferential treatment; and combining resources across agencies so that hiring processes do not continually compete for the same applicants or take employees from each other.

Themes by Research Question

The responses to these interview questions helped to identify qualitative research themes that began with the research questions at the start of the study. Those themes were:

Research Question 1.

What are the minimum qualifications for individuals to apply for the position of firefighter at Tucson-area fire agencies, and why?

Research Theme:

The minimum qualifications for individuals to apply for the position of firefighter at Tucson-area fire agencies vary depending on the department.

This research question was addressed in Interview Question #8 with supporting information found in Questions #12 and #14. First, answers to Interview Question #8 demonstrated that minimum qualifications for each agency vary. Subsequently, Questions

#12 and #14 provided information that shows a department's ability to provide a certain level of training in the academy influences the minimum qualifications they require.

This is usually linked to budgetary capacity or training capabilities. Interviewee No. 2 stated, "I know our training staff would run an academy in the parking lot, they have told me they would. But it just isn't a good enough training grounds to get the right kind of training for the state." Interviewee No. 1 expressed, "I know it limits us, but we don't have the budget to run an academy like that. I wish we could, but it's just not going to happen."

Interviewee No. 3 reported, "I think it was good for us when we finally removed the certifications from the minimum qualifications for applying. We immediately saw an increase in our applications, and we were able to capture individuals who wanted to enter the fire service but never had the time or circumstance to get them (certifications). We heard it during interviews, people were grateful for the chance to apply, and we got some great firefighters because of it."

Interviewee No. 4 stated, "I think we noticed that the applicant pool was pretty small when we required certifications. We kept seeing the same people apply again and again and eventually we had to hire them because there were no other candidates to choose from. This wasn't ideal and we knew we had to change if we wanted to expand and capture more people. It's still a mix when we hire. Some people have certifications, some don't. But at least we aren't interviewing the same people three and four times anymore."

Research Question 2.

What are the different parts that make up hiring processes in Tucson-area fire agencies, and how do they differ from hiring processes in the private sector?

Research Theme:

The different parts that make up hiring processes for Tucson-area fire agencies differ from each other and from those of businesses in the private sector.

This research question was addressed in Interview Questions No. 4, 5, 10, and 11. Information provided by interviewees to Question No. 4 demonstrated that all departments in this project use social media and word of mouth as their main form of advertising. Question No. 5 showed that some Tucson-area fire departments are utilizing new technology in their process while others have not updated their processes for several hiring cycles. Questions No. 10 and 11 established how fire department hiring processes differ from those in the private sector. The most notable difference is the inclusion of a physical ability test which is common for fire departments but not private businesses. Question No. 11 showed while similarities exist in the hiring processes of the Tucson-area fire departments included in this study, there is no consistency from one department to another and each agency holds processes unique to them.

The number of stages varies from four to eight and the only consistent similarities across all five departments are an application, written test, and at least one in-person interview. Interviewee No. 1 stated they must “keep the process as simple as possible” because they have such low application numbers and are consistently trying to attract new employees. They also recently changed the method of administering the written test from an online version to a paper hard copy in attempts to reduce test anxiety in

applicants and obtain more passing grades. Interviewee No. 1 stated, “I made this change because of feedback from the applicants. They didn’t like the online test. It made them nervous, and the failure rate was high. So, I decided to go back to the paper test and proctor each one myself. Applicants seem to like this way better, and we get more passing grades.”

Interviewee No. 3 stated, “After every hiring process we evaluate what we could change or do better, what worked and what didn’t. Once we figure that out, we change as needed. Our process has changed a lot over the past few years especially once we added the video interviews. But even that needed some tweaking, so it’s always a work in progress”. Interviewee No. 4 had a similar perspective and stated, “We do an after-action review after every hiring process to see what worked and what didn’t. The whole training staff is involved, and we make changes as needed.”

Both Interviewee No. 2 and No. 5 reported that their hiring processes have not changed since they have been in their positions. Interviewee No. 5 stated, “I know this process is the same process we have used for years. I have heard about other departments using video interviews and other things, but we have a way of doing things here that is hard to change. So, we don’t change it.”

Research Question 3.

Which part of fire agencies’ hiring processes may produce barriers, and can they be modified or eliminated to reduce those obstacles and increase the number of applicants?

Research Theme:

Fire agencies' hiring processes produce barriers which can be modified or eliminated to reduce obstacles and increase the number of applicants.

This research question was addressed in Interview Questions No. 9 and 14. Question No. 9 demonstrated that interviewees did not feel as though there were any barriers in their hiring processes that prevented individuals from applying. Question No. 14 showed that this perspective may be biased because application numbers across the region suggest that departments who require state certifications as minimum qualifications have fewer applicants than departments who provide that training in the academy.

Interviewee No. 3 stated, "I know when we used to require certifications we did not get near as many people as we do now. There were only so many people to choose from and they were the ones interviewing for every department. We'd see people time and time again and knew they weren't going to be a good fit for us. Our hands were tied, we needed people but the only ones left weren't good."

Interviewee No. 4 supported this opinion by acknowledging their application numbers also increased once they removed state certifications as minimum qualifications. "It took us a long time to get to the point where we could provide an academy that teaches Fire I and II and EMT. A lot of people don't have the time or money to get those on their own and the ones that do are usually younger and don't have much life experience. Now we get a wide variety of people to choose from. If they have certifications that's great, but if they do not we will absolutely train them."

Interviewee No. 1 reported they get many applications after each semester at the local community college is complete. “This is when we get a fresh group of individuals all with their certifications and all looking for employment. It is usually a busy time for a short period, then the interest dies off as they get jobs with us or other departments in the area. Then, in a few months, it repeats itself.”

Interviewee No. 2 stated, “I wish we didn’t have to require certifications. I know it lowers our overall numbers. But we just don’t have the capacity to train new recruits to the level needed to do the job. It’s a money thing, it’s a time thing, and it’s a facility thing. We would love to coordinate with another department and maybe offer a joint academy and share resources. Right now, this is where we are at.”

Additional Themes

Additional themes then arose between the literature review and the participants’ responses to the interview questions. Four key themes were identified throughout the course of this study. Those themes were:

1. **Tucson-area fire departments take employees from each other and compete for the same recruits.**

Fire departments in Tucson compete for the same employees and oftentimes take firefighters from other local departments. This is particularly true for departments that require certifications as minimum qualifications because of the limited number of people who possess them. Individuals oftentimes apply at more than one department in efforts to increase their chances of being hired by someone. For those with certifications, the desire to get a job oftentimes overrides the actual department they are applying with. Once they have secured a job, they can then seek employment with the department they actually

want to work for and will leave their place of employment if offered a position somewhere else.

Interviewee No.1 stated, “We lose firefighters each time another agency does a hiring process. We have a great culture and environment, but we just can’t pay what other places do. We know this, but we can’t do anything about it. So, we just keep hiring. It’s constant and never-ending but what can we do. I get it, I just don’t know what to do about it.”

Interviewee No. 3 stated, “I know we lose people to other fire departments sometimes, but it usually isn’t in Tucson. I mean, sometimes but that’s rare. I think the last time was like 15 years ago that actually happened. Mostly, people are getting jobs up in Phoenix and their families are up there, so they just go back when they finally get the chance. I know we take people from other departments every time we hire, too. We all talk to each other about it. It’s hard, but we have to keep our staffing numbers up.”

Interviewee No. 2 stated, “I know we compete for the same people. We have people working at the college who talk to kids in the fire science classes and try to recruit the ones they think would be a good fit for us. Of course, other departments are there doing the same thing. The thing is, just because they have the certifications doesn’t mean they are going to be a good fit for us. That right there makes a small number of people who could work for us even smaller. We don’t just want people. We want the right people.”

2. **Tucson-area fire departments that utilize technology in the hiring process have a higher number of applicants than those that do not.**

Departments that utilize technology in their hiring process have seen increased numbers of applications compared to when they did not use the technology, and their numbers are greater than departments that do not use such technology. Online applications, written exams, and interview processes have allowed individuals to complete the first three stages of a hiring process without having any in-person contact. This benefits the applicant by allowing them to complete these stages on their own time in environments they can control. It also benefits the department by reducing the number of personnel hours it typically takes to proctor tests and conduct interviews. Applications from individuals in other cities and states have also increased for departments which use online or mobile technology.

Interviewee No. 4 stated, “I have seen an increase in applications from other states, for sure. We used to get a few, but now we get a couple dozen or so. That doesn’t mean they always finish the application or get hired, but there are more of them. I think it’s easy for people from other areas to apply because they don’t have to make a lot of trips here. I mean, they eventually have to come and do things in person, but if we can limit that I think it only makes it better for them.”

Interviewee No. 3 reported, “I’ve seen an increase in the number of applications, and that’s great. What I really like is how easy it is for us to organize scores and have real-time information on how many people are successful in each stage. We can pull up a report at any time and know how many applications we have, how many of them have taken the written test, and how many will be doing the interviews.”

Interviewee No. 5 stated, “I know other departments are using online programs in their hiring processes. It’s kind of a push right now that people up in Phoenix started. We

are looking at it, and maybe we will do it. I wish we would look into it. Our numbers are lower than they have been and I'm open to anything that will help."

3. **Physical ability tests are important but may remove individuals who could be a good hire.**

Physical ability tests remove unsuccessful candidates from the hiring process. The number of candidates removed depends on the test. Based on information provided by interviewees, the CPAT removes a greater percentage of applicants than department-specific physical ability tests. One department did not require a physical ability test as a part of their hiring process; however, all recruits were required to pass it at the end of the academy.

Interviewee No. 4 stated, "In the last testing process, we lost about 100-or-so in the CPAT. That helped reduce our numbers and made it more manageable for those folks grading the next step. One thing we changed this last time was mandating candidates to come to our facility and take the test. We were finding that some people were using other people's (CPAT) cards and saying they passed when they really didn't. There isn't good accountability from companies giving the test, so we just made them come and do it here."

Interviewee No. 1 stated, "I have only seen 3 people fail the physical ability test in all the times it has been given. One of them didn't even make it through the stair climb. And one of them was someone from another department trying to get hired on here. I told them, listen, you need to get in better shape or you are going to hurt yourself or someone else."

Interviewee No. 5 reported, “We lose the most people during the written and the CPAT. People just aren’t ready for it. They come in out of shape and by the end of the stair climber are just done. I’m not sure of the numbers. I’d say maybe half of the people who make it to the CPAT don’t pass it. You can tell who has prepared and who hasn’t. We try to help people get ready, but there is only so much you can do. Eventually, it’s up to the person to get in shape or not. If they can’t do the CPAT, there’s no way they can handle the academy.”

Interviewee No. 2 stated, “I don’t think many people fail the physical ability test. We have practices for people who are applying, and we let them go through it a couple of times before they are actually tested. They get to touch the equipment and feel how heavy things are. I think that has helped. The people who practice end up passing, but we don’t have that many fail overall.”

Interviewee No. 3 stated, “We haven’t done the physical ability test the past couple of times. We’re probably going to go back to it though. This last process we saw a lot of people trying to get hired who looked like they might not be able to do the job. I mean, I’ve seen people on day one not be able to pass the physical ability test and by the end of the academy they’re able to do it really fast. I think that shows people can build up and get in shape and get better if they’re given some time. I don’t think we eliminate people because they can’t pass a test that we can help them pass. We would’ve lost some good people if we didn’t hire them because they couldn’t pass because eventually, they did pass it. And they are great employees.”

4. **Tucson-area fire departments are willing to lower minimum scores on a given portion of the hiring process to increase the number of candidates moving to the next stage.**

To keep numbers up and move as many people through the hiring process as possible, departments are willing to lower previously determined minimum scores on a given stage of the hiring process. This course of action is borne from the fear that too many applicants will be removed from process because of failing a certain stage. If the number of applicants who reach the final stage is not adequate, departments may be forced to choose an employee they would rather not hire. To avoid this possibility, departments lower their minimum score threshold in hopes of capturing a greater number of candidates and ultimately hiring the individuals they want.

Interviewee No. 3 reported, "I wish we didn't have to, but sometimes we lower scores. In order to hire a certain number of people, we have to have at least double that moving to the final stage. If we don't have that, we might not get all the people we need and then we have to do the whole thing all over again. And that just isn't going to happen. We need people when we need people, so we just lower some scores until we get the number that we need."

Interviewee No. 1 stated, "I lower the scores if I need to. I really don't have a choice sometimes. We don't get a lot of people applying in the first place, so I do a lot of coaching and help them before they take the test. If we don't get enough people, and they are close, well, that's a discussion to have when we need it."

Interviewee No. 5 reported, "The hiring process is set and we have to stick to it. Our numbers may be down and I wish we could adjust things, but once the process has

started it is what it is. We've lowered minimum scores for subsequent hiring processes so that we can get more candidates, so that is a change. I mean, now it is low enough so that a lot of people get through the written. The CPAT is set. It is either a pass or a fail and we can't do anything about that."

Summary

A qualitative interview study, using semi-structured interview questions, was conducted involving five human resource specialists from five Tucson-area fire departments. Each of the interviewees were involved in developing and implementing the hiring process for their respective department. The interviews aimed to obtain information regarding the hiring processes of each department. The results of the interview questions helped answer the qualitative research questions asked at the start of the study and identified additional themes that the researcher felt should be considered when evaluating the overall effectiveness of each department's hiring process for recruit firefighters.

Themes relating to the research questions and additional information gained through interviews included the differences between Tucson-area fire department's hiring processes; how minimum qualifications vary between departments; how departments requiring state certifications as minimum qualifications have lower application numbers than those that do not; the fact that Tucson-area fire departments compete for the same candidates and take employees from each other when hiring; the trend that departments that use technology in their hiring process have higher application numbers than departments that do not use technology; the possibility that physical ability tests are important but may remove good candidates from the process; and that Tucson-area fire departments are willing to lower minimum scores on a given portion of the testing process to increase the number of candidates moving on to the next stage.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

Summary of the Results

The problem identified for research involved examining the hiring processes for recruit firefighters by Tucson-area fire departments to see if current practices create barriers that affect overall application numbers. Fire departments have traditionally used hiring process designs that have been in place for years with limited updates or changes. Considering the availability of new technology and the limited employee pool each organization is trying to reach, departments seeking to attract new candidates should update their processes to more innovative platforms. This modernization results in greater application numbers and better hiring outcomes.

The literature review and participants' responses to the questions asked during the semi-structured interviews in this qualitative study helped to understand the hiring processes of Tucson-area fire departments. The literature review helped to understand the foundation of a fire department's hiring process, the stages that exist within that process, what the process is seeking to find in an applicant, and potential barriers that could exist that prevent individuals from applying.

It also examined hiring processes conducted by private businesses to investigate if they offered any insight on how fire departments could improve their own processes. The literature review helped in the development of the interview questions used in the study (Appendix C). The interview questions allowed the researcher to develop themes based on the research questions asked at the beginning of this project. The significant research themes identified by the participants were:

1. The minimum qualifications for individuals to apply for the position of firefighter at Tucson-area fire agencies vary depending on the department. Those minimum

qualifications subsequently affect the number of candidates applying for employment for each department. The more minimum qualifications required, the lower the number of applicants.

2. The different parts that make up hiring processes in Tucson-area fire departments differ from each other and those of businesses in the private sector. Departments that use mobile technology in their hiring processes have larger application numbers than those that require in-person participation at every step of the process.
3. Fire departments' hiring processes produce barriers which can be modified or eliminated to reduce obstacles and increase the number of applicants. This is particularly true when it comes to certifications as minimum qualifications.

Conclusions Based Upon Results

The research not only answered the qualitative research questions asked at the beginning of this study, but also uncovered additional themes. These themes are: Tucson-area fire departments take employees from each other and compete for the same recruits; Tucson-area fire departments that utilize technology in the hiring process have a higher number of applicants than those that do not; Physical ability tests are important but may remove individuals who could be a good hire; and, Tucson-area fire departments are willing to lower minimum scores on a given portion of the hiring process to increase the number of candidates moving on to the next stage.

Research and additional themes produced during this project align with literature review topics that addressed differences in fire department and private sector hiring processes. Most notably, the number of applications Tucson-area fire departments receive during a hiring process increases if mobile technology is used. The literature review also supported themes which suggested identifying barriers that can be modified or eliminated could also increase application

numbers. Examples of these barriers would be a physical fitness component, or the number of minimum qualifications required to apply for a position (Beitia et al., 2022).

Hiring processes held by Tucson-area fire departments vary from each other although certain aspects are similar or even the same. Minimum qualifications to apply for a position as a recruit firefighter also differ and these prerequisites have the greatest impact on application numbers (Soni & Soni, 2016). In short, the more the minimum qualifications, the fewer the number of applications.

Departments with greater personnel and budgetary capabilities can hire individuals without any firefighting experience and train them during the academy. These departments attract a larger number of applicants than departments without such capabilities. These departments can also select candidates who best fit their culture and appear to be good fits for their organization.

Firefighting and EMS skills are taught over several weeks in a comprehensive academy where repetition leads to mastery prior to entering the field as a full-time employee. Departments with lower personnel and budgetary capabilities must require firefighting and EMS certifications as minimum qualifications to being hired. This results in a much smaller pool of candidates to pull from because the number of individuals who have these certifications is limited (Moore, 2011).

Secondly, because departments are all seeking to hire individuals who are interested in becoming firefighters, they are all competing for the same person to ultimately hire. It is not uncommon for a firefighter to leave one Tucson fire department to go and work for another. Typically, it is the smaller agencies who lose their employees to larger ones. This results in

frequent staffing shortages for agencies that require firefighting and EMS certifications for employment.

These smaller departments are once again put in a hiring dilemma with few candidates to choose from. Removing any potential barriers for applicants to overcome would benefit small departments more than large ones. Based on the research done for this study, the largest barrier keeping individuals from applying for a job as a firefighter is requiring certifications as prerequisite minimum qualifications (Moore, 2011). Utilizing mobile technology during the hiring process could also increase application numbers; however, the ability to provide training during an academy that results in certifications rather than requiring certifications as minimum qualifications ultimately leads to the largest application numbers in the city. Information found during the literature review supports these themes and suggests that removing barriers which place added hardship on potential applicants could increase application numbers (Beitia et al., 2022).

Limitations

Tucson-area fire departments vary in size from a one-station fire district that serves a small population in a rural area to a large fire department with 22 stations that serves a mostly urban population of over 540,000 residents. The sample size used for this qualitative study was limited in size (five departments) but likely represented the hiring processes used by departments across the region. Whether the five departments were a representative sample size was not determined during this study (Creswell et al, 2018).

As with most qualitative research studies, it is difficult to investigate causality and the results cannot be verified. This study investigated the hiring processes of Tucson-area fire departments from the perspective of those creating and conducting the processes. It did not

account for the perspective of individuals who are participating in the hiring processes. Because of this limitation, the study is one-sided and favors the viewpoint of the departments. It considers the challenges faced by organizations and how to overcome them in a holistic manner, but it does not address the true challenges faced by the applicant on an individual level. Therefore, a similar study evaluating the experience of a candidate going through a hiring process to gain their perspective is recommended. The two studies could then be compared to find common themes and areas of improvement.

Implications and Recommendations to the Field

Based on the findings of this study, there are several recommendations that Tucson-area fire departments could implement to increase the number of applications they receive during a recruit firefighter hiring process. The first is to utilize available technology whenever it can be implemented throughout appropriate stages in the process. As stated in the literature review, applicants are comfortable with technology that allows them to use their internet-abled devices to complete preemployment tests (Brown et al., 2023). This means accepting applications online, holding question and answer sessions online, administering written tests online, and conducting interviews online when appropriate (via Zoom or pre-recorded interview sessions).

Software exists that encourages departments to make this change. Allowing candidates to complete portions of the hiring process on their own time instead of repeatedly coming to in-person sessions increases the likelihood that they will apply and see the process through. It also makes it possible for individuals who live greater distances away to participate as well.

Secondly, lowering the minimum score on a given portion of the hiring process to increase the number of candidates moving to the next stage may not be beneficial in the long run. If the hiring process is designed to eliminate candidates who are not overall fits for a given

department, the process must be trusted. Lowering scores to move more candidates to the next stage may only be moving them to the next stage where they are eliminated.

Third, and finally, if Tucson-area fire departments want to increase applications, they need to decrease the number of certifications needed as minimum qualifications for being hired. This is challenging for smaller departments; however, it does not mean eliminating all certifications. Any state certification that can be taught in-house (i.e., EMT, HAZMAT) will increase the likelihood of capturing individuals who do not have that training and motivate them to apply. The largest factor seen in this research study that creates barriers for individuals to apply for the position of firefighter are state-certified minimum qualifications. Any way a department can reduce the number of certifications needed as minimum qualifications will be a positive step and increase application numbers.

Recommendations for Future Research

The literature review identified a gap in academic literature, specifically literature aimed at addressing barriers which may exist in fire departments' hiring processes. While there are valuable articles that address challenges faced by women seeking to become firefighters, with respect to physical ability tests, other barriers were difficult to identify. In addition, articles examining the hiring practices of private businesses to specifically improve fire departments' processes were not identified in this study.

It is hoped that this Capstone paper helped bridge this gap by attempting to apply some of the best practices used in the private sector and display how they could be relevant in the fire service. Additionally, a broader view of barriers preventing individuals from applying for positions in the fire service would be beneficial for future decision makers when it comes to hiring process design and implementation. It is further hoped that this study will inspire future

researchers to study the effectiveness of hiring processes in the fire service and offer new and innovative ways to make them comprehensive and effective.

Conclusion

A qualitative research study examining the hiring process for recruit firefighters by Tucson-area fire departments to see if current methods create barriers for applicants that affect overall application numbers was conducted. An extensive literature review was also conducted. The literature review identified common practices for hiring processes in the fire service and examined hiring processes in the private sector to see if they provide opportunities for fire departments to learn from. Lastly, a gap analysis was performed to make recommendations to Tucson-area fire departments to remove potential barriers, to increase application numbers, and to improve their hiring processes.

Updating hiring processes by including technology and removing barriers will hopefully increase application numbers for all Tucson-area fire departments. Constant evaluation of each department's process will ensure those hiring processes remain effective and relevant through changing times and hiring cycles. If each department understands how to reach prospective employees, encourages them to apply, provides relevant testing parameters, and supports them through the process, they will be able to extract the best fit for their organizations and keep their staffing at appropriate levels.

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Appendix A

Outreach Email Requesting Assistance with EFO Paper

Hello,

My name is Jeremy Hilderbrand and I am reaching out today to ask for assistance with some questions I have regarding a brief survey for a research paper which is my final project for the Executive Fire Officer program at the National Fire Academy. The purpose of the paper is to examine Tucson-area fire departments' hiring processes, compare them with each other, and recommend any changes that could occur to make them more successful.

Would it be possible to follow this link https://www.surveymonkey.com/r/B28KB5J and answer three questions to see if your organization fits the criteria of the research, and if so, point me in the direction of the person who would be able to assist answering follow-up questions that are more detailed and specific?

Thank you in advance for your time. I appreciate the assistance.

Sincerely,
Jeremy Hilderbrand

Questions:

1. Does your fire department hold hiring processes for recruit firefighters?
2. Is this done by a third party or taken care of in-house?
3. Who would be the best person to ask follow-up questions to regarding your hiring process (name and email address)?

Appendix B

Interview Consent Form

Interview Consent Form

Identification of Investigators & Purpose of Study

You are being asked to participate in a research study conducted by Jeremy Hilderbrand from the National Fire Academy (NFA) and Columbia Southern University. The purpose of this study is to develop a better understanding of a critical issue in the fire and emergency services. This study will contribute to the researcher's completion of their final project for the Executive Fire Officer program.

Research Procedures

Should you decide to participate in this research study, you will be asked to sign this consent form once all of your questions about the study have been answered to your satisfaction. The study consists of an interview that will be administered to individual participants. You will be asked to provide answers to a series of questions related to your experience within a particular community. **An [audio/video] recording of the interview will be taken for transcription purposes. The [audio/video] file will be deleted at the conclusion of the study and will not be shared with anyone other than the researcher.** You may turn off your camera if you do not wish to be filmed.

Time Required

Participation in this study will require approximately 45 minutes of your time.

Risks

The investigator does not perceive more than minimal risks from your involvement in this study (that is, no risks beyond the risks associated with everyday life).

The NFA, Columbia Southern University, and its contractors take no responsibility for the actions or outcomes of the research study.

Benefits

There are no direct benefits to the participant; however, information from this study may benefit your, and other communities, in the future.

Incentives

There are no incentives (financial or otherwise) associated with participation in this study.

Confidentiality

The results of this research will be presented to NFA and Columbia Southern University program faculty and students. The results of this project will be coded in such a way that the respondent's identity will not be attached to the final form of this study. The researcher retains the right to use and publish non-identifiable data. While individual responses are confidential, aggregate data will be presented representing averages or generalizations about the responses as a whole. All data will be stored in a secure location accessible only to the researcher. Upon completion of the study, all information that matches up individual respondents with their answers (including audio and/or video recordings) will be destroyed. Final aggregate results will be made available to participants upon request.

Participation & Withdrawal

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind.

Questions about the Study

If you have questions or concerns during the time of your participation in this study, or after its completion, or you would like to receive a copy of the final aggregate results of this study, please contact:

Jeremy Hilderbrand
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Giving of Consent

I have read this consent form, and I understand what is being requested of me as a participant in this study. I freely consent to participate. I have received satisfactory answers to my questions. The investigator provided me with a copy of this form. I certify that I am at least 18-years of age.

☐ I give consent to be filmed and audio recorded during my interview. _____ (interviewee initials)
☐ I give consent to be audio recorded during my interview. _____ (interviewee initials)

Interviewer Signature		**Date**:	

Interviewee Signature		**Date:**	
Interviewee Signature		**Date:**	

Appendix C

Interview Questions

1. How long have you been employed by your department?
2. How many recruit firefighter hiring processes have you been involved in?
3. Please explain your recruitment process for new firefighters (if any).
4. How do you advertise that you are hiring?
5. Do you use any new technology in your hiring process? If so, what would that be?
6. How often do you hold recruit academies?
7. Have you seen a change in the number of applicants over the past few years? If so, what changes have you noticed?
8. What are the minimum qualifications to apply for the position of firefighter in your organization?
9. Do you perceive any barriers that may prevent people from applying to be a firefighter in your department? If so, what do you think those may be?
10. Do you require some sort of physical ability test? If so, what do you use and what is the pass/fail rate?
11. Please explain the steps of a hiring process (i.e., written exam, interview, etc.).
12. How long are your recruit academies, and what do you teach in them?
13. Do you have physical training (PT) in the academy? If so, how often?
14. Are any certifications earned during the academy (i.e., Fire I and II, EMT)?
15. If you could make any recommendations on how to improve the hiring process, what would they be?

Appendix D

Data Analysis

Interviewee No.	Question 1 / Responses
	How many years have you been employed by your department?
1	5
2	8
3	10
4	4
5	12

Interviewee No.	Question 2 / Responses
	How many recruit firefighter hiring processes have you been involved in?
1	6
2	7
3	10
4	9
5	12
Average	8.8 years

Interviewee No.	Question 3 / Responses	Theme 1	Theme 2	Theme 3	Theme 4
	Please explain your recruitment process for new firefighters (if any)?	Recruitment Team at Community College.	Recruitment Team at High Schools.	Current employees who teach at Community College.	Informal word-of-mouth from current employees.
1			1	1	1
2		1	1		1
3		1	1	1	1
4		1		1	1
5		1	1	1	1
	Total:	4	4	4	5

Interviewee No.	Question 4 / Responses	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5
	How do you advertise that you are hiring?	Social media (Instagram, Facebook, etc.)	Job search websites (LinkedIn, etc.)	Department website	Local media	Word-of-mouth
1		1		1		1
2		1	1	1		1
3		1	1	1		1
4		1		1		1
5		1	1	1	1	1
	Total:	5	3	5	1	5

Interviewee No.	Question 5 / Responses	Theme 1	Theme 2	Theme 3	Theme 4
	Do you use any new technology in your hiring process? If so, what would that be?	No new technology.	Software program for applications.	Software program for written test.	Software program for interviews.
1		1			
2			1		
3			1	1	1
4			1	1	1
5			1		
	Total:	1	4	2	2
Notes:	The term “new” technology could have been replaced with “technology” or even “software program”. Answers would have been the same and the question may have been clearer.				

Interviewee No.	Question 6 / Responses	Theme 1
	How often do you hold recruit academies?	Whenever it is needed.
1		1
2		1
3		1
4		1
5		1
	Total:	5
Notes:	The answer given by all interviewees was “whenever it is needed.” None of the departments interviewed had a set schedule to hold academies.	

Interviewee No.	Question 7 / Responses	Theme 1	Theme 2	Theme 3	Theme 4
	Have you seen a change in the number of applicants over the past few years? If so, what changes have you noticed?	Numbers have gone up.	Numbers have gone down.	No change in the numbers.	Increase during COVID only.
1				1	1
2			1		1
3			1		1
4			1		1
5			1		1
	Total:	0	4	1	5

Interviewee No.	Question 8 / Responses	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5
	What are the minimum requirements needed to apply for the position of firefighter in your organization?	Driver's license, at least 18 years old, high school diploma or GED.	Arizona State Fire I and II	Arizona EMT or CEP	Arizona State Fire HAZMAT	Arizona State Fire Wildland
1		1	1	1	1	1
2		1	1	1	1	1
3		1				
4		1				
5		1				
	Total:	5	2	2	2	2

Interviewee No.	Question 9 / Responses	Theme 1	Theme 2
	Do you perceive any barriers that may prevent people from applying to be a firefighter in your department? If so, what do you think those may be?	No barriers.	Candidates intimidated by computer testing software.
1		1	1
2		1	
3		1	
4		1	
5		1	
	Total:	5	1

Interviewee No.	Question 10 / Responses	Theme 1	Theme 2	Theme 3	Theme 4
	Do you require some sort of physical ability test? If so, what do you use and what is the pass/fail rate?	Yes, the CPAT.	Yes, our own physical ability test.	No.	Pass/fail rate.
1			1		Most everyone passes.
2			1		Estimated 5%
3				1	n/a
4		1			Estimated 40%
5		1			Estimated 40%
	Total:	2	2	1	
Notes:	Answers given were failure estimations by the interviewees. Interviewee 1 had seen only three failures in nearly 5 years of administering the physical ability test. The CPAT appears to have a larger failure rate than the department's physical ability test.				

Interviewee No.	Question 11 / Responses	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7	Theme 8
	Please explain the steps of a hiring process (i.e., written exam, interview, etc.)?	Application.	Written exam (aptitude-based).	Written exam (behavioral-/cognitive-based).	Physical ability test.	Panel interview.	Credibility test.	Chief's interview.	Psychological test.
1		1	1		1	1			
2		1	1		1	1			
3		1		1		1	1	1	
4		1		1	1	1	1	1	1
5		1	1		1	1			
	Total:	5	3	2	4	5	2	2	1
Notes:	Interviewee 2 stated feedback from current firefighters is they would like to add more stages to their hiring process. They would like to make a practical section where candidates demonstrate their proficiency in firefighting skills. No other agency interviewed currently has a practical portion.								

Interviewee No.	Question 12 / Responses	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6
	How long are recruit academies and what do you teach in them?		Department culture and firefighting/EMS procedures.	Arizona State Fire I and II.	Arizona State EMT.	Arizona State HAZMAT.	Arizona State Wildland.
1		2-4 weeks	1				
2		4-6 weeks	1				
3		16 weeks	1	1	1	1	1
4		18 weeks	1	1	1	1	1
5		24 weeks	1	1	1	1	1
	Total:		5	3	3	3	3
Notes:	Interviewees 1 and 2 stated there were options for how long an academy could be held based on the experience of the people who were hired. Because certifications are required to be hired, if an academy has more experienced than inexperienced an academy could be held over a shorter period.						

Interviewee No.	Question 13 / Responses	Theme 1	Theme 2
	Do you have physical training (PT) in the academy? If so, how often?	Yes, daily.	No.
1		1	
2		1	
3		1	
4		1	
5		1	
	Total:	5	0
Notes:	All Tucson-area departments hold daily physical training in their academies.		

Interviewee No.	Question 14 / Responses	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5
	Are there any certifications earned during the academy (i.e., Fire I and II, EMT)?	No.	Arizona State Fire I and II.	Arizona State EMT.	Arizona State HAZMAT.	Arizona State Wildland.
1		1				
2		1				
3			1	1	1	1
4			1	1	1	1
5			1	1	1	1
	Total:	2	3	3	3	3
Notes:	No certifications are earned in departments 1 and 2 because they are prerequisites for being hired.					

Interviewee No.	Question 15 / Responses	Theme 1	Theme 2	Theme 3	Theme 4
	If you could make any recommendations on how to improve the hiring process, what would they be?	Remove favoritism by graders.	Combine resources across the region to maximize hiring efforts.	Help firefighters whose friends don't get hired understand the process.	Keep the process confidential.
1			1		
2		1			1
3		1		1	1
4		1		1	1
5		1		1	
	Total:	3	1	3	3
Notes:	Departments do their best to keep testing processes confidential, but information about the test oftentimes makes it out. It is also difficult for departments to reduce favoritism by graders who are evaluating people who they want to be hired. This was reported by Interviewees 3, 4, and 5 as an issue they face.				