Public Administration's Ability To Ensure Service Quality Through Occupational Licensing Requirements: A Multiple Linear Regression Analysis

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Abstract

Occupational licensing was developed to protect the public good. Public administrators are tasked with the responsibility of ensuring future workers enter their professions prepared to provide adequate service quality to the public. This study is grounded in the framework of public interest theory and seeks to evaluate whether the administration of occupational licensing and its associated requirements by public licensing boards aligns with the theory's intended purpose of serving and protecting the public good. Public interest theory posits public administration operates in the best interest of the population, rather than for personal gain. A multiple linear regression was performed to assess if the licensing requirements established by public administrators ensure service quality and work towards the public interest. These requirements included the passage of state and national exams, experience or training requirements, and educational requirements, as well as fingerprinting or background checks. The multiple linear regression analysis was performed in SPSS to determine if to what extent, and how a combination of licensing application requirements by licensing agencies predicts the quality of services provided by licensed workers in Arizona. This study found the predictor variables only accounted for 5.8% of the variance in complaint rates. The results of this analysis outline the complex and multifaceted nature of the relationship between occupational licensing and service quality as well as a misalignment between the intent of these requirements and their practical outcome on service quality.

Keywords

Occupational licensing, public administration, licensing administration, service quality, public interest theory, social closure theory

Introduction

The purpose of this study is to examine whether public administrators are effectively fulfilling their role in ensuring that workers are adequately prepared to enter their respective professions and deliver quality services. This study's independent/predictor variables will be the agency's requirement to pass state exams, national exams, complete a set amount of experience/training, fulfill post-secondary educational requirements, and the submittal of fingerprints or the passage of a background check. The study's dependent/outcome variable will be the number of complaints against licensed workers in Arizona per 1,000 workers. Recent research on occupational licensing has called for further research into occupational licensing's impact on the public (Darwynn & Deyo, 2022; Chung, 2020; Kleiner & Bryson, 2019).

Occupational licensure functions as an administrative mechanism to regulate labor markets and control entry into various professions (Chung, 2020). One of the most important aspects of licensing administrations is their requirement to protect the public and ensure adequate service quality (Barsky, Carnahan, & Spadloa, 2021). To ensure service quality, public administrators will set various requirements to obtain a license (Chung, 2020). Recent research has contended that current occupational licensing requirements have moved beyond solely protecting the public good and have imposed unnecessary burdens to entry (Knepper et al., 2023). By enforcing stringent regulations, these agencies can limit access to specific occupations (Knepper et al., 2023). This regulatory authority highlights the administrative dimension of occupational licensing.

This analysis attempts to determine if public administrators are acting within the public interest theory and ensuring licensed workers are adequately prepared to provide quality services. Previous literature on research methods has shown the importance of examining multiple independent variables against one dependent variable (Dattalo, 2013). By doing so, the research may provide a more valid assessment of the dependent variable. Therefore, this analysis will test five independent variables against the number of complaints received against licensed workers in Arizona. By analyzing the number of complaints received by licensing agencies, the quality of services being provided by licensed workers can be captured. The quality of services will be analyzed based on the number of complaints received by the licensing administration per 1,000 licensed workers. This study will build upon previous research, which calls for additional study into the impacts on service quality (Kleiner & Bryson, 2019; Chung, 2020), as well as present original findings on occupational licensing and its requirements.

Researchers examining the effects of occupational licensing have called for further research into occupational licensing's impact on the public. Morris Kleiner and Alex Bryson (2019) ask "What are the costs and benefits of these occupational regulations to the society?". Additionally, Bobby Chung (2020) states the "quality effect [of occupational licensure] warrants further discussions." The examination of the relationship between occupational licensing and service quality will be instrumental in public administration research as it shows the effectiveness of public agencies and their ability to ensure adequate levels of service. Barsky, Carnahan, and Spadloa (2021) noted the oversight of service quality by licensed workers are an important function of public administration.

Public administrative agencies play a significant role in shaping the structure and accessibility of labor markets within their jurisdictional boundaries (Hafiz & Marinescu, 2023). One of the primary instruments through which these agencies exert influence is the regulation of occupational licensure (Cascino, Tamayo, & Vetter, 2021). By increasing the complexity or difficulty of licensure requirements, public administration can limit the entry of professionals into a given labor market, thereby restricting workforce mobility across state lines (Barrios, 2021). Alternatively, administrative bodies may seek to expand labor market participation by lowering licensure thresholds and easing regulatory constraints (Sindelar et al., 2007).

Regulatory purview over worker power influences these labor markets (Hafiz & Marinescu, 2023). This purview can exclude groups of people from entering the profession (McCandless, et al., 2022). Under the occupational closure theory, public licensing administrations can use their regulatory power to close an occupation to benefit those already within the profession (Weeden, 2002). Public administration is also responsible for ensuring proper levels of service and protecting consumers (Han &

Kleiner, 2021). Carroll and Gaston (1981) contend the process of defining the quality of services across multiple professions is difficult (Carroll & Gaston, 1981). To navigate this challenge, this analysis will measure the changes to the quality of services by examining the number of filed complaints against licensed workers, as each public licensing administration has a specific complaint process for their respective professions.

This analysis falls within the scope of public administration research as it focuses exclusively on licensure rather than certification. Certifications are similar to licensure; however, workers are not legally barred from performing the work and certifications are typically issued by non-governmental certification bodies (Cunningham, 2019). These nongovernmental bodies are found in the private sector and, therefore, would not have any public administrative significance. Occupational licenses are developed, implemented, and regulated entirely within the public sector by licensing agencies. This process underscores the public administrative significance of occupational licensing research, as changes to licensing requirements can directly affect the agencies responsible for their regulation and implementation. Importantly, public administration can influence and restrict the labor markets (Terolli, 2021) by reforming their occupational licensing standards and rules (Cascino, Tamayo, & Vetter, 2021). "Public administrators are public servants working in public departments and agencies at all levels of government" (Thapa, 2020, p. 3). Therefore, these licensing agencies are public sector agencies who fit within the field of public administration.

Occupational licensing constitutes a core function of public licensing agencies and is a significant area of study within the field of public administration. Licensing administrators are charged with establishing licensure requirements, approving applications, and overseeing the intake and investigation of complaints. Existing research on occupational licensing has highlighted its potential to influence service quality and to facilitate the removal of underperforming or unethical professionals from the workforce (Caldwell, Freeman, & Smith, 2018).

When service quality declines and the volume of complaints increases, licensing agencies can face a strain in resources. Agencies are directly responsible for handling complaints, and a substantial portion of their organizational capacity is devoted to addressing disciplinary matters. According to Pendo et al. (2021), most of the time and resources allocated within licensing administrations are consumed by the investigation and resolution of such issues. As a result, any fluctuation in the number of complaints received can have a measurable impact on how public administration agencies allocate their time, personnel, and financial resources.

Problem

It is not known if the public interest theory is actively guiding public administrators in their requirements for occupational licensing. The American Consumer Satisfaction Index indicates a decline in consumer satisfaction with worker performance. Additionally, researchers have noted the United States workforce is ill-prepared for the demands of the current workplace (Casner-Lotto & Barrington, 2006). In the State of Arizona, occupational licensing rates and licensing requirements has increased every year as Arizona ranks as the 5 th strongest state for occupational licensing in the United States (Knepper, et al., 2022).

This analysis will study if a combination of licensing application requirements by public licensing boards protects the public good by examining the service quality by licensed workers. The analysis of service quality will be done by collecting the number of filed complaints received by the public licensing agencies in Arizona. This information is important for public administration research as one of the essential functions of these public administrative agencies is their quality and consumer protection (Barsky, Carnahan, & Spadola, 2021). If these requirements can predict service quality, researchers and licensing agencies can determine if the requirements for licensure are operating within the public interest theory and protecting the public.

Research Question: Is there a significant predictive relationship of service quality (*complaints*) from the occupational licensing requirements to pass a national examination (*ntlexam*), statewide examination (*stexam*), fulfilling training or experience requirements (*experience*), satisfying educational requirements (*educ*), and the passage of a background check (*bgcheck*)?

> **$H_0$1:** There is no statistically significant predictive relationship of service quality (*complaints*) from the occupational licensing requirements to pass a national exam (*ntlexam*), statewide exam (*stexam*), fulfilling training or experience requirements (*experience*), satisfying educational requirements (*educ*), and the passage of a background check (*bgcheck*)?
>
> **H_a1:** There is a statistically significant predictive relationship of service quality (*complaints*) from the occupational licensing requirements to pass a national exam (*ntlexam*), statewide exam (*stexam*), fulfilling training or experience requirements (*experience*), satisfying educational requirements (*educ*), and the passage of a background check (*bgcheck*)?

Table 1

List of Variables

Variable	Variable Type	Level of Measurement	Operational Definition	Data Collection	Previous Studies
Number of Complaints	Dependent Variable	Ratio	Number of complaints received by the licensing board per 1,000 licensed workers	Records Requests of Licensing Board Meeting Minutes	Frye, 2021; Shilling & Sirmam, 1988; Chung, 2022
National Exam	Independent Variable	Nominal	Requirement to pass a national exam for an occupational license (1); No requirement to pass a national exam for an occupational license (0)	Licensing Board Applications	Norcini, et al., 2014; Archer, et al., 2016; Tambyln, et al., 2002; Kenny, McInnes, & Singh, 2013; Price, et al., 2018; Boulet & van Zaten, 2014
State Exam	Independent Variable	Nominal	Requirement to pass a national exam for an oc	Licensing Board A	Norcini, et al., 2014; Archer, et al., 2016; Tambyln, et al., 2002; Kenny, McInnes, & Singh, 2013; Price, et al., 2018; Boulet & van Zaten, 2014
Experience Requirements	Independent Variable	Nominal	Requirement to complete a predetermined number of supervised or unsupervised on-the-job experience hours for an occupational license (1); No requirement to complete a predetermined number of supervised or unsupervised on-the-job experience hours for an occupational license (0)	Licensing Board Applications	Becker, 1993; Barrios, 2021; Kleiner, 2015; Powell & Vorotnikov, 2012; Shen & Tang, 2018
Training Requirements	Independent Variable	Nominal	Requirement to complete a training program for an occupational license (1); No requirement to complete a training program for an occupational license (0)	Licensing Board Applications	Becker, 1993; Barrios, 2021; Kleiner, 2015; Powell & Vorotnikov, 2012; Shen & Tang, 2018
Education Requirements	Independent Variable	Nominal	Requirement to obtain a post- secondary degree for an occupational license (1); No requirement obtain a post- secondary degree for an occupational license (0)	Licensing Board Applications	Gallie, et al., 2014); Kleiner & Krueger, 2013
Fingerprinting/ Background Checks	Independent Variable	Nominal	Requirement to submit a set of fingerprints for a background check at the time of submitting an application packet or provide evidence of passing a background check prior to submitting an application for an occupational license (1); No requirement to submit a set of fingerprints for a background check at the time of submitting an application packet or provide evidence of passing a background check prior to submitting an application for an occupational license (0)	Licensing Board Applications	Carrollo, et al., 2022; Decker, 2021; Khan, Hossein, & Imam, 2024; Dunlap, Basye, & Skillman, 2021; Brody, Perri, & Van Buren, 2015; Levashima & Campion, 2009

This study will use a quantitative non-experimental research design to predict the change in the number of complaints received by licensing boards based on their licensure requirements. The research

question for this analysis is: Is there a significant predictive relationship of service quality from the occupational licensing requirements to pass a national examination, statewide examination, fulfilling training or experience requirements, satisfying educational requirements, and the passage of a background check?

The study's independent/predictor variables will be the agency's requirement to pass state exams, national exams, complete a set amount of experience/training, fulfill post-secondary educational requirements, and the submittal of fingerprints or the passage of a background check. The study's dependent/outcome variable will be the number of complaints received by licensing administrations per 1,000 licensed workers. The hypothesis for this study is the application requirements put forward by Arizona licensing administrators will be able to predict the number of complaints received by licensing boards. This analysis will assume that each requirement contributes linearly to service quality by licensed workers.

Previous research has supported the examination of this research question. Scholars examining the relationship between occupational licensing impacts have called for further research into occupational licensing's impact on the public. Morris Kleiner and Alex Bryson (2019) ask "What are the costs and benefits of these occupational regulations to the society?". Additionally, Bobby Chung (2020) states the "quality effect [of occupational licensure] warrants further discussions." Furthermore, Khan, Hossein, and Imam (2024) detailed a literature gap surrounding the practice of pre-employment background checks.

The proposed research questions will examine the relationship between the requirement to pass a background check prior to receiving an occupational license and service quality. Regarding examination requirements, Price, et al. (2018) noted that current research is unclear of the impact exam requirements have on service quality. Additionally, Boulet and van Zaten (2014) have asked for further research into the impact exam requirements have on service quality in the medical industry. This analysis will test the relationship between the requirements to pass state or national exams and the complaints received by licensing boards. Furthermore, previous literature on the relationship between training requirements/experience hours and service quality has outlined mixed results (Powell & Vorotnikov, 2012; Shen & Tang, 2018). This analysis will add to this field of literature. Additionally, this analysis and its findings will contribute to two competing theoretical frameworks surrounding occupational licensing.

Background

Researchers have found that the average citizen is ill-prepared to join the workforce in the United States (Casner-Lotto & Barrington, 2006). Furthermore, there has been a decline in worker performance and consumer satisfaction across multiple industries (ACSI, 2025). In the State of Arizona, occupational licensing rates and licensing requirements have increased every year as Arizona ranks as the 5th strongest state for occupational licensing in the United States (Knepper, et al., 2022). Occupational licensure is an administrative tool used to influence the labor market and regulate workers entering the profession (Kleiner & Krueger, 2013). Licensing agencies employ a variety of administrative rules and procedures to limit or expand the work being conducted in the state (Kleiner & Krueger, 2013). Licensing administrations can restrict access to the profession within their state through heightened regulations (Knepper, et al., 2023). Some of the application requirements include training requirements, the passage of a background check, the passage of exams, etc. This analysis will be examining the licensing agencies in Arizona that oversee occupational licensing.

Historical Context

Occupational licensing can trace its roots back to medieval times, as medieval guilds limited entry into certain occupations in the 13th and 14th centuries (Larkin Jr., 2017). In the United States, the first major breakthrough for occupational licensing was the United States Supreme Court case Dent v. West Virginia. This 1889 ruling handed down a decision in favor of the state of West Virginia and granted states the ability to license professions surrounding citizens' health. Most importantly, the decision in the case showed the Supreme Court's belief that state law was the most suitable venue to regulate occupations concerning citizens' safety, health, and well-being (Kleiner, 2015). Ultimately, this provided the opportunity for states to require licenses for a variety of occupations. Moreover, it protected the rights of the states to require these licenses and upheld the principle of federalism in this area.

Figure 1

Occupational Licensing Has Grown Substantially in the US

Note. From Kleiner, M. (2017). The influence of occupational licensing and regulation, *IZA World of Labor*, 1-10.

With this rapid rise, the number of public administration bodies increased in the United States as licensing agencies were established to oversee licensed professions. Furthermore, the issuance of occupational licenses evolved into an administrative process. Additionally, the formal administrative procedures involved in granting licenses can enhance public confidence in the profession. (Sitaraman & Stack, 2023). By the 1980s, nearly 18% of the American workforce were in occupations which were licensed at the state level (Kleiner & Krueger, 2010). By 2008, approximately 23% of the workforce was subject to licensure (Kleiner, 2017). In 2019, the percentage of the United States labor force subject to occupational licensing hovered at 25% (Blair & Chung, 2019). Ultimately, one in four workers in the United States holds an occupational license. As a result, any administrative changes related to occupational licensing and the agencies that oversee it have the potential to affect millions of workers. If these changes influence the quality of services, consumers of these goods and services may also be affected.

Theoretical Context

The theoretical framework for this analysis is rooted in public interest theory, which asserts that public administration functions to safeguard the public (Thomas & Thomas, 2022). Within this framework, occupational licensing is viewed as a mechanism for ensuring consumer safety. Public value theory extends this concept by contending that public administration is driven by the goal of creating societal value and addressing collective needs, rather than only correcting market failures (Chohan, 2024). Further examining the role of public boards and agencies, stewardship theory believes that these governing bodies, and the people serving within them, serve as stewards of the public good rather than pursuing personal economic gain (Keay, 2017). Within the context of occupational licensing, this framework suggests that administrative licensure regulations and requirements are designed to protect the public from poor service quality.

A competing set of theories aligns with the social closure theory and includes public choice theory, occupational closure theory, and regulatory capture theory. This perspective argues that in-group members seek to monopolize resources and restrict access to their resources to protect their own interests (Weber, 1922). Scholars have applied this framework to occupations, identifying occupational closure theory and regulatory capture theory as explanations for how regulatory actions serve those already within the professional group.

Advocates of occupational licensure often justify its implementation and expansion as a means to protect public safety. These regulatory changes typically involve increasing licensure requirements. Common examples include the addition of education or training mandates, higher fees, and mandatory examinations. Each of these measures is intended to ensure that licensed professionals are adequately prepared to perform their duties in a competent and responsible manner.

Changes to licensing regulations can be enacted entirely through the administrative rulemaking process. This process allows public administrators and licensing boards to independently establish or revise licensure requirements without the need for legislative approval. Within this structure, public administrators have significant discretion in setting application-related conditions. In some instances, state agencies may impose higher financial costs, such as increased application or processing fees. These elevated costs can serve as a barrier to entry, particularly for applicants with limited financial means (Knepper et al., 2024). Research by Buonanno and Pagliero (2020) indicates that these financial barriers may contribute to discriminatory outcomes. In one study, researchers found that 49 percent of applicants encountered exclusionary effects stemming from restrictive licensing practices.

Other research contends that changes which increase the licensure requirement standards can protect workers who are already licensed (Blair & Chung, 2019) and promote citizen safety (Farronato, et al., 2024). These notions highlight a leading school of thought amongst researchers and administrators who see licensing as a necessary protection for citizens, as the license acts as a controlling mechanism to ensure a high quality of services (Farronato, et al., 2024). Additionally, licensing can raise the wages for licensed workers (Pizzola & Tabarrok, 2017).

Agencies and researchers from this perspective see occupational licensing as a benefit to both the workers within the profession and the consumer of the service. Competing theories believe occupational licensing creates a disproportionate burden to entry for new workers and can unnecessarily raise the price

of goods for consumers. Research within this framework has shown the costs and requirements of an average license for low-to-moderate-income occupations within the United States include one year of education and experience, the passage of one exam, and $295 in fees (Carpenter et al., 2023). Here, researchers contend the expanded scope of occupational licensing can disproportionately impact workers with lower economic means and discriminate against them (Blair & Chung, 2021). This disproportionate impact occurs because it is difficult to attain the license, thus creating a burden to entry. Therefore, scholars have noted the need for occupational licensing reforms which reduce unnecessary burdens associated with licensure (Carpenter et al., 2023; Mehtora, Nimgaonkar, & Richman, 2021). Additionally, once a license is attained in one state, the license does not always carry over to another state. This lack of transferability, ultimately, can reduce worker migration (Johnson & Kleiner, 2020).

While these competing frameworks strive to strike a balance between protecting citizens through occupational licensing and ensuring the barrier to entering an occupation is not too high, researchers have also examined occupational licensing from a purely economic standpoint (Han & Kleiner, 2021; Kleiner & Soltas, 2023). These economic impacts have been a key area of study for scholars (Han & Kleiner, 2021; Kleiner & Soltas, 2023). The main economic impacts of occupational licensing examined by researchers include the premiums it places on services and goods provided by licensed employees, wage increases for licensed professionals, changes in consumer decision-making, labor shortages, worker migration, and firm location. The findings of these impacts show how state administrations can use occupational licensing to impact their economy and labor markets (Blair & Chung, 2022). To meet economic demands, licensing administrations may raise or lower licensure requirements (Blair & Chung, 2022). Because public agencies and public administrators entirely administer and oversee occupational licensing, it is important to research the impact of changes to occupational licensing requirements have on the administrating agencies and their ability to fulfill their requirement of protecting citizens.

Social Context

Occupational licensing is ultimately overseen by public administration and falls within the public domain. Furthermore, Morris Kleiner and Alan Krueger suggest licensure exists to protect public administrative interests rather than serving the public (Kleiner & Krueger, 2013). James Wilson supports this claim in his seminal book, The Rise of the Bureaucratic State, by stating public licensing administrations use their powers for personal gain (Vyas-Doorgapersad & Simmons, 2009). These powers grant public licensing administrations the ability to leverage their authority to self-preserve (Wilson, 1975). Here, administrative agencies have the ultimate decision-making authority for licensure (Hasday, 1997). Furthermore, this authority can be used to exclude participation in the specific labor market.

In sum, occupational licensing has evolved considerably in the United States. What was initially used to regulate certain healthcare professions to ensure patient safety has now developed into an area which covers 25% of the United States labor force. While some researchers highlight the need for occupational licensing to ensure the quality of services and worker protection (Gius, 2016), other frameworks have shown the negative aspects of occupational licensing, such as labor shortages and discrimination against various groups attempting to enter the profession (Buonanno & Pagliero, 2020). These competing frameworks highlight the different viewpoints on occupational licensing. Since the licensing boards choose these regulations, occupational licensing is subject to numerous policies and programs. To examine the impacts of occupational licensing, scholars must conduct research at the state level.

Literature Review

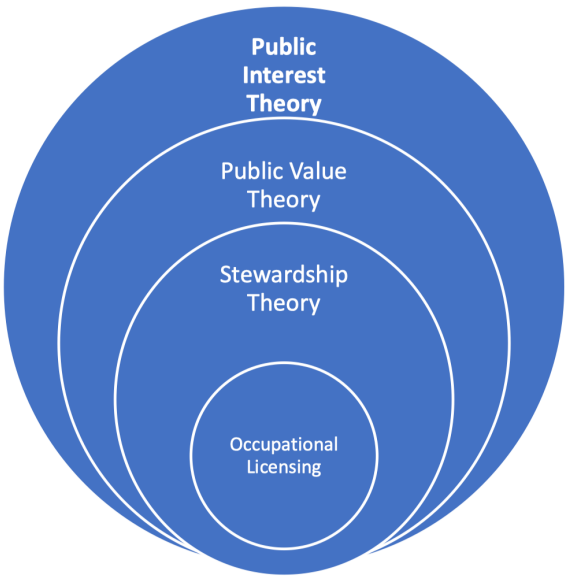
Scholars have increasingly examined the broader impacts of occupational licensing, with many calling for further investigation into its implications for the public. Deyo (2022), for example, emphasizes the need for additional research to assess the extent to which occupational licensing promotes service quality for consumers. Similarly, Kleiner and Bryson (2019) pose a central question for the field: "What are the costs and benefits of these occupational regulations to society?" Chung (2020) further argues that the "quality effect [of occupational licensure] warrants further discussions," highlighting the ongoing debate over its effectiveness in protecting the public interest.

Theoretical Framework

The purpose of this section is to identify the theoretical framework that contributes to this analysis. The theoretical framework for this analysis stems from the public interest theory. Under public interest theory, public administration and its actions work to protect the public (Thomas & Thomas, 2022). Here, occupational licensing can protect the public through ensuring consumer safety. Public value theory contends that public administration acts to create societal value and addresses collective needs and can go beyond just addressing market failures (Chohan, 2024). Public value theory posits that public administrations are motivated by the desire to create societal value, focusing on collective interests and the public good (Chohan, 2024). Going further and examining the role of public boards and agencies, the stewardship theory holds that these directing bodies act as stewards of the of the public good and not for their own economic interests (Keay, 2017). For occupational licensing, this framework holds the regulations and requirements set forth by public administrators are intended to protect the public good from poor services. Figure 2 highlights this theoretical framework and shows occupational licensing within them.

Figure 2

Public Interest Theoretical Framework



Public Interest Theory

Public interest theory suggests that regulations are established to protect and benefit the public (Thomas & Thomas, 2022). At its core, public interest theory contends that regulations and government interventions are designed to serve the public good (Thomas & Thomas, 2022). According to this perspective, occupational licensing ensures licensed workers meet minimum competency standards, thus safeguarding consumers and maintaining high-quality services (Barrios, 2022). Under the public interest theory, the role of the administrative agency involves correcting labor market inefficiencies, protecting consumers from exploitation, and ensuring equitable resource distribution. The theory is grounded on the notion that markets, left to their own without public administrative oversight, may fail to achieve socially desirable outcomes (Thomas & Thomas, 2022). This theory is built on the belief that government interventions are necessary to correct market failures. One of the foundational aspects of public interest theory is the focus on the welfare of the general public over individual or corporate interests. For example, recent studies highlight the importance of regulatory frameworks that prioritize public health, safety, and environmental sustainability (Carpenterer, et al., 2019). Researchers have highlighted how environmental regulations aimed at reducing pollution levels have led to significant public health benefits. These findings showcase the theory's practical implications in today's modern government (Carpenter, et al., 2019). Without this administrative oversight, the private sector would not have worked in the public's best interests.

Public interest theory has evolved significantly since its inception in the early 20th century (Thomas & Thomas, 2020). Initially, the theory was strongly associated with the Progressive Era in the United States. The New Deal era further solidified the role of public interest theory in shaping regulatory policies. Government interventions during this period aimed to stabilize the economy, provide social security, and protect consumers. This increased intervention came through the rise in the number of public agencies overseeing public welfare programs. Over time, the theory has been applied to address new challenges, such as environmental protection and market stability.

Despite its widespread acceptance and application, public interest theory has some drawbacks. One of the primary critiques is the potential for regulatory capture, which occurs when regulatory agencies are co-opted by the industries they are supposed to regulate. This capture can lead to regulations that favor industry interests over the public good (Yandle, 2022). Furthermore, some argue that public interest theory does not account for the public actors within the oversight agencies (Thomas & Thomas, 2020). Here, the individual actors will use their power to act in their own best interests over the best interests of the public (Thomas & Thomas, 2020). These bad actors can lead the public interest theory being supplanted by the capture theory (Aranson & Ordeshook, 1981).

Occupational licensing can fit within the modern adaptation of the public interest theory (Chambers & O'Reilly, 2021). Some researchers have supported the view that occupational licensing can enhance public welfare (Kleiner & Soltas, 2023). Moreover, occupational licensing can act as a barrier to entry, which, while often criticized, can also serve to maintain professional standards (Farronato, et al., 2023). By restricting the number of workers, licensing agencies help ensure that only those with adequate qualifications and training are allowed to operate, thereby protecting consumers from unqualified and potentially harmful service providers (Barrios, 2022).

Public Value Theory

Public value theory expands the role of public administration beyond simply correcting market failures. Rather, public value theory contends that public administration should create value for the public (Chohan, 2024). Within this theory, public administration should create a tangible benefit for the public (Moore & Bennington, 2010). Importantly, this may not be the most cost-effective way of governance. Previous theories, such as new public management theory, emphasize cost-effectiveness as a vital aspect for public administration (Voorn, Van Genugtan, & Van Thiel, 2020). Rather, public value theory emphasizes the collective good, even if that means the public administration moves beyond market efficiency (Chohan, 2024). Rather than narrowing focusing on cost-efficiency, public value theory consists of two main dimensions, "what is the public value and what adds value to the public sphere?" (Marcon, 2014, p. 332). The public sphere is intended to be defined as a public space in which citizens can address their collective concerns (Marcon, 2014).

Contrary to its counter theory of public choice theory, public value theory assumes the public administration is acting in the best interest of the public (Chohan, 2024). Here, public administration solely focuses on protecting the public and serving the public good rather than serving for their own personal gain. With this, an important component of public value theory is that the public administration needs to be proactive in addressing concerns and creating value for the (Chohan, 2024). One of the most important pieces of public value theory is that public administrations need to maintain trust and approval from those it governs (Moore & Bennington, 2010). Furthermore, public value theory suggests the markets may not be able to adequately serve all of the public needs without public sector involvement (Chohan, 2024). In these instances, the public administration needs to deploy its resources to protect the public.

Occupational licensing fits within the public value theory. Within this framework, the licensing agencies are acting in a way to protect the public and ensure quality services. Under public value theory, the licensing board is not acting for personal gain. Additionally, the requirements for licensure are not a means to exclude participants into the profession but rather to protect the public good. By enhancing the quality of services by licensed workers, the licensing administration are providing a public good. Furthermore, licensing boards and their meetings can act as the public setting where members of the public can bring forward their collective concerns.

Stewardship Theory

Public value theory emphasizes the role of public managers in shaping services to meet societal needs. Scholars have gone further and examined the human element and motivations of the public officials and managers in the public sector. Unlike the competing social closure theoretical framework, stewardship theory contends that the public servants are instinctively motivated to act as stewards of the public good (Keay, 2017). This is a stark contrast from regulatory capture and public choice theories which contend that the actors within these public agencies are primarily focused on personal gain (Morris & Johnson, 2020). Under this theory, the personal motivations of the individuals on public boards are to protect the consumers. Similar to public value theory, stewardship theory does not focus on incentive and performance-based systems that emphasizes cost-efficiency (Steinfeld, 2023).

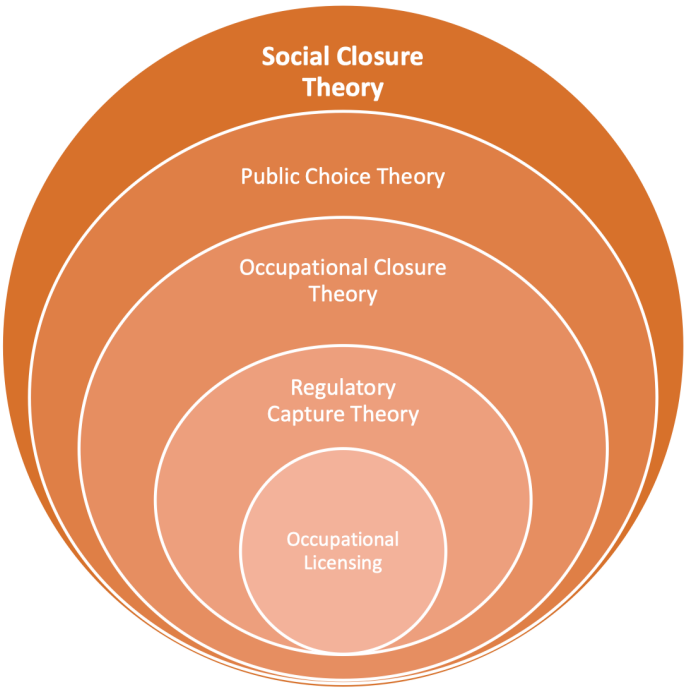
Under the stewardship theory and occupational licensing, the licensing board members themselves act in the best interest of the public. Importantly, this theory contends that this is instinctive in nature (Keay, 2017). With this instinctive nature, the individuals leading the occupational licensing agencies will inherently support measures that will serve the public good. Therefore, flexibility and decreased oversight is associated with this theory (Keay, 2017). For occupational licensing, this is important as the licensing requirements proposed by the agencies are adopted to ensure consumer protection rather than for personal gain.

Social Closure Theory

A competing set of theories fall under the social closure theory and includes the public choice theory, occupational closure theory, and the regulatory capture theory. Researchers contend that individuals in the in-group attempt to monopolize resources to protect themselves from other groups (Weber, 1922). Going further, scholars have examined this framework through the scope of occupations and have identified the occupational closure theory and regulatory capture theory. Researchers have examined the social closure theory through the public sector and outlined the public choice theory. Figure 3 outlines these theories and highlights how each theory becomes more refined towards occupational licensure.

Figure 3

Social Closure Theoretical Framework



Social closure theory is a theoretical concept and framework developed by Max Weber in 1922. Here, Weber contends social closure is a process of drawing boundaries, constructing identities, and building communities and classes to monopolize resources for the group's benefit while excluding the use of these resources from other groups (Weber, 1922). This theory highlights social classes and defines

divisions between them. When constructed along socially salient lines, the practice of social closure becomes a form of discrimination (Albiston & Green, 2018). As it relates to licensure, Blair and Chung (2021) have noted the licensing requirements set forth by licensing administrations have created statistical discrimination for members of certain demographic groups. Through the construction of barriers and consolidation of resources, the dominant groups maintain their elite status and continue their advancement. These dividing barriers can come in a variety of forms. Some examples include the restricting of access to certain elite educational institutions, nepotism, and market monopolies.

Furthermore, researchers have noted how historically, public administration has been responsible for both the creation of administrative structures which marginalized groups and the removal of these structures (McCandless, et al., 2022). Under Weber's social closure theory, public administration would have been responsible for the closure of opportunities for certain groups. James Q. Wilson, in his book The Rise of the Bureaucratic State, claims licensing administrations are the possession of public power by persons who use it for private purposes (Vyas-Doorgapersad & Simmonds, 2011). This statement outlines how occupational licensing can fit within this closure theory, as the licensing administrations can use the power for private purposes and gain by excluding new members from entering the profession and reducing competition.

Jackson and Leon (2010) described the role of institutions throughout social closure theory. Here, institutions act as vessels to enact social closure. These institutions can include academic institutions and labor institutions. As it relates to occupational licensing, it is the public agency who is tasked with regulating licensure who can act as this type of institution. By restricting access to these institutions, the in-group can reduce competition in a sector or a social class. This restriction is especially true for academic institutions due to their role in supplying labor markets (Tholen, 2017). However, academic institutions have begun to enact policies prohibiting this type of gatekeeping (Jackson & Leon, 2010).

As noted above, while academic institutions may have been a large factor in this social closure, public administration has been involved in a variety of ways. First, governments and public agencies may introduce practices which reinforce system inequities. For example, public agencies in the past engaged in urban planning procedures which led to limited access to quality services and opportunities for minority groups (Lens, 2022). Public administration has also been historically a vessel for progress in relieving these marginalized communities. Public administration has played crucial roles in advancing marginalized groups through the implementation of administrative practices and procedures which focus on inclusive public policies, social programs, and affirmative actions (Pager & Shephard, 2008). Here, public administration worked to dismantle formalized discrimination and ensure equal access to public services (Pager & Shephard, 2008).

Building on Weber's original social closure theory, Frank Parkin furthered the theory by differentiating the intent of the elite social groups who control the resources. Here, Parkin believes social classes should not be solely characterized by their collectives. Rather, they should be distinguished by their mode of collective action (Burris, 1983). Parkin defined two different modes of closure: exclusion and usurpation. Under the original Weber model, these differences would have still fallen under the broad term of closure. These two modes have distinct differences. Exclusionary closure refers to the original intent of the social closure theory. Here, exclusionary closure occurs in a downward direction (Murphy, 1986). As described above, exclusionary closure occurs when the group in power closes access to the

resources. Here, the group in power excludes the group underneath them. Thus, the downward movement described by Parkin. One example, as it relates to occupational licensing, is how licensure can exclude immigrants from receiving a license (Tani, 2020). Once an immigrant receives a license, their earnings can increase by 19.8% (Brucker, et al., 2021). Occupational licensing fits within Parkin's exclusionary model.

The usurpation model defined by Parkin takes a different approach. Rather than a downward model, usurpation closure works in an upward manner. Here, the out-groups attempt to win a greater share of the resources and restrict the resources of the current in-group (Murphy, 1986). This notion is the main addition made by Parkin to Weber's original social closure theory. The usurpation framework challenges the original class stratification. Usurpation closure can range from slight redistribution of resources to the complete dispossession of the dominant ingroup (Murphy, 1986). This type of closure requires the mobilization of members of the outgroup (Barbalet, 1982).

For occupational licensure under this theory, those who possess an occupational license would attempt to close the market for personal gain. This can be done through the application process by including burdensome requirements that limit the number of new members into the profession. This would benefit those who possess an occupational license as there would be less competition in the space.

Public Choice Theory

Public choice theory, through the lens of public administration, examines the motivations and behaviors of individuals within the public sector. Researchers have shown public officials, like all individuals, are driven by self-interest (Karadimas, 2022). This self-interest can lead to inefficient and poor public administration (Karadimas, 2022). Additionally, the theory explains the persistence of rent-seeking activities, where interest groups exert considerable influence on rules and regulations to secure economic gains, often at the expense of the public interest (Congleton, 2004). Public choice theory also sheds light on the challenges of collective decision-making processes, where the aggregation of individual preferences can result in decisions which do not necessarily reflect the collective good of the public (Firidin, 2022). Public choice theory highlights the importance of mitigating self-interested behavior within the field of public administration.

The public choice theory blends well with the social closure theory when assessing administrative processes for occupational licensing. Social closure theory contends the in-groups will close off favorable benefits from out-groups (Simi & Matusitz, 2016). For occupational licensing, this means excluding those without an occupational license from obtaining a license. Under the public choice theory, this means that the licensing boards may engage in self-interested behavior by unnecessarily excluding potential licensed workers from entering the occupation if it was to their own personal benefit. By excluding workers through the licensing process, those who already obtained a license may receive additional benefits (Blair & Chung, 2019; Kim 2020; Kim & Chatterji, 2020).

Occupational Closure Theory

Going a step further, scholars began applying social closure theory directly to the labor market. This application to the labor market is known as occupational closure. Occupational closure theory "argues that social and legal barriers around occupations raise the rewards of their members by restricting the labor supply, enhancing diffuse demand, channeling demand, or signaling a particular quality of

service" (Weeden, 2002, p.55). Historically, five methods have been implemented to close certain occupations. These methods include licensing, educational credentialing, voluntary certification, association representation, and unionization (Weeden, 2002). Once an occupation is closed, it can increase the benefits of those who have already entered the profession. These benefits can increase the interest of those in the profession to continue reducing the competition for the profession. More specifically, material monopolies can provide the motive for the closure of the group (Murphy, 1986). One study found countries with higher levels of entry regulations experienced higher levels of income inequality (Chambers, McLaughlin, & Stanley, 2019). This income inequality can highlight the stratification which may occur due to these regulations. However, occupational closure has also been attributed to the ability of closed professions to provide shelter against discrimination (Drange, 2018). This shelter aligns with Vyas-Doorgapersad and Simmons' (2009) notion where licensing agencies can act based on their own personal interests.

While occupational licensing does not completely close a profession and create a monopoly, it does add an additional step for someone looking to enter the profession. This additional step may be burdensome enough for some individuals to choose to either not enter the profession entirely or enter the profession at a lower level. In 2023, the average cost of an occupational license was $295 in fees, 362 days of education or training, and the passage of one exam (Knepper, et al., 2023). Workers who obtained the occupational license will have exclusive access to the group of potential customers. These customers act as the vital resource in Weber's social closure theory. By restricting entry into the profession, the occupational license can act as a mechanism within the social closure theory as it partially closes off the out-group.

Regulatory Capture Theory

Regulatory capture theory asserts that regulatory agencies, which are intended to act in the public interest, are often dominated by the very industries they are supposed to regulate. This phenomenon occurs when regulatory agencies create policies and regulations that benefit a specific industry rather than the general public. More specifically, one study defined regulatory capture as "the result or process by which regulation […] is consistently or repeatedly directed away from the public interest and toward the interest of the regulated industry, by the intent and action of the industry itself" (Yates & Cardin-Trudeau, 2021, p.303). As industries exert influence over the regulatory process, public welfare can be compromised, leading to inefficiencies and inequities. As it relates to occupational licensure, this would create unnecessarily high burdens for obtaining a license that decreases competition and causes a labor shortage.

Regulatory capture theory suggests that regulators can be swayed or "captured" by the interests of the industry they regulate rather than remaining neutral and acting in the public interest (Yates & Cardin-Trudeau, 2021). Researchers have built on the regulatory capture theory by dividing the types of captures into strong captures and weak captures (Yates & CardinTrudeau, 2021). Hard captures represent takeovers in which the public would be better served with no regulation over the occupation (Carpenter & Moss, 2014). Soft captures highlight situations in which the public would be better served when the occupation is being regulated, even if the regulating agency is acting in its own best interest (Carpenter & Moss, 2014). These captures can occur through various means, including lobbying, employment practices, and other forms of influence. For occupational licensure, it is often the professional administrations themselves who lobby for increased licensure requirements and the introduction of

licensing for the occupation (Morris & Johnson, 2020). This advocacy stems from the benefits licensure provides for the members of the association (Morris & Johnson, 2020). A foundational aspect of regulatory capture theory is the idea that industries have greater resources and incentives to influence regulators compared to the interests of the general public. According to Dal Bo, regulatory capture is facilitated by the asymmetry in resources and information between regulated industries and the general public, leading to an imbalance in influence over regulatory outcomes (Dal Bo, 2006).

Regulatory capture theory remains highly relevant, particularly in sectors with significant regulatory frameworks. One prominent example is the pharmaceutical and medical industry. Here, the healthcare administrations act in beneficial ways for certain physician groups and increase revenues (Murray, 2022). Research has also indicated the Food and Drug Administration (FDA) often faces pressures from pharmaceutical companies to expedite drug approvals, sometimes at the expense of thorough safety evaluations (Carome, 2022). The financial sector also provides a clear illustration of regulatory capture. According to Admati (2017), the influence of large financial institutions on regulatory bodies such as the Securities and Exchange Commission (SEC) has led to regulations which favor industry practices over consumer protection. This influence was evident in the lead-up to the 2008 financial crisis and continues to be a concern even after the 2008 crisis (Admanti, 2017). Environmental regulation is another area where regulatory capture is evident (Macatangay & Roeben, 2019; Prihandono, & Widiati, 2023). One study found energy companies have influenced regulatory bodies to shape policies in ways designed to prioritize industry profits over environmental sustainability (Prihandono, & Widiati, 2023). With occupational licensure, the licensing administrations can set the requirements for new licenses. This allows the administration to restrict access to new licenses. Researchers have shown the increase in these requirements can increase the benefits for those who possess a license while financially passing the burden on to the consumer (Farronato, Fradkin, & Larsen, 2024).

Regulatory capture theory offers a framework for understanding the dynamics between regulatory agencies and the industries they oversee. The theory highlights the potential for industries to exert undue influence on regulators, leading to policies where industry interests are prioritized over public welfare. This prioritization of industry interests is in direct contrast to the public interest theory.

Variable Selection

Previous research on occupational licensing and its impact on services has found that in certain professions the license can reduce negative outcomes (Anderson, et al., 2020). One explanation for this variance amongst professions is that each profession has specific licensing requirements (Rozema, 2024). Some licensing requirements may exclude unfit workers from the profession, and others may lead to more training (Rozema, 2024). State boards use these requirements to protect against unqualified workers entering the profession (Barrios, 2021).

Background Checks

A common provision of the occupational licensing application process is the applicant passing a background check (Gray, 2021). State licensing boards use the background check as a measure to ensure applicants are of good moral character (Carollo, et al., 2022). The requirement of a background check for occupational licensing is primarily intended to protect consumers by preventing individuals with histories of harmful behavior from entering certain professions and ensuring the workers are of good moral

character (Decker, 2021). The assumption is that a clean background reduces the risk of future misconduct, thus protecting the agency and the customer (Khan, Hossein, & Imam, 2024). Proponents of background checks argue that they serve as a crucial safeguard, particularly in professions involving vulnerable populations, such as the medical industry (Dunlap, Basye, & Skillman, 2021). By screening out individuals with criminal records related to violence, fraud, or abuse, the goal of these checks is to minimize the risk of clients being harmed (Brody, Perri, & Van Buren, 2015). Under the legal theory of negligent hiring, which makes employers liable if they should have known an employee was likely to harm other, employers are encouraged to use background checks to protect themselves from civil lawsuits (Levashina & Campion, 2009).

Scholars contend the occupational licensing requirements related to background checks have become excessively burdensome. More specifically, researchers have noted that blanket bans which automatically prohibits any applicants with certain criminal records disproportionally impacts certain groups of citizens (Rodriguez & Avery, 2016). Furthermore, nearly one in three adults have a record in the criminal justice system (Rodriguez & Avery, 2016). Therefore, requirements involving a clean criminal record can reduce the number of applicants for occupational licensure as well as cause the application to be denied by the licensing board.

Moreover, a background check is a snapshot in time and does not guarantee future behavior (Levashina & Campion, 2009). The background check may not be able to predict whether an individual will engage in misconduct after obtaining a license (Levashina & Campion, 2009). Additionally, the scope and criteria of background checks can vary widely amongst the requesting party. Some background checks may focus solely on criminal records, while others may include credit history, social media activity, or other personal information (Khan, Hossein, & Imam, 2024).

In sum, previous research has identified the legal justification for agencies to use preemployment background checks to screen for negative impacting behavior (Levashina & Campion, 2009). In public administration, and especially for agencies that require an occupational license, this is typically done as part of the licensing process. Proponents of these background checks contend that these requirements can act as a potential safeguard against future bad actors (Dunlap, Basye, & Skillman, 2021). Khan, Hosain, and Inam (2024) note that there is an existing gap in pre-employment background check literature. More specifically, these authors state, “As pre-employment background checks are important in selection practice, it should also get similar importance from the academics. However, we do not still have adequate theoretical and empirical papers that have focused on this important issue, creating a clear research gap” (Khan, Hossein, & Imam, 2024). Khan, Hossein, and Inam (2024) call for further research into the area to keep up with current practices. Therefore, this research will include the requirement to pass a background check as a predictor variable to service quality.

Exam Requirements

One of the most common requirements for licensure is the requirement to pass either a state jurisprudence or a national exam (Knepper, et al., 2022). Those who support licensing exams argue these requirements set a minimum level of knowledge and skill, crucial for good practice (Norcini, et al., 2014). By making applicants prove they understand key concepts and procedures, these exams filter out those who aren't qualified which can ensure service quality (Archer, et al., 2016). These types of exams are very common amongst the medical industry where service quality impacts the health of the patient (Norcini, et

al., 2014). The exam acts as a check, giving the public confidence that licensed professionals have met a certain level of expertise (Archer, et al., 2016).

In some instances, licenses may require an applicant to pass up to seven exams (Knepper, et al., 2022). Some researchers contend these exams can create barriers to entry, making it harder for people from disadvantaged backgrounds to enter certain professions (Knepper, et al., 2022). This barrier can lead to a less diverse workforce and limit access to services for underserved communities. The limited supply of professionals can also increase costs for consumers (Adams, Jackson, & Ekelund, 2017). The types of exams required for licensure can be divided into two distinct categories, written and practical (Federman, et al., 2006). Both types of exams provide their own set of challenges for applicants. Written exams may be extra burdensome for applicants who are attempting to overcome a language barrier (Federman, et al., 2006). Practical exams may even require applicants to bring their own materials (Knepper, et al., 2022). Additionally, these types of exams may require the applicants to be at a specific location at a specific time. Both provisions may be burdensome for low-income applicants (Knepper, et al., 2022). Previous research has shown that the requirement to pass an exam in some professions can cause 10% of potential applicants to not receive an occupational license (Rozema, 2024).

Prior research examining the predictability between exam scores and licensed worker performance or customer complaints has yielded mixed results. One study found that the scores of a medical licensure examination could act as a predictor of prescribing success for the first four to seven years of a primary care physician's career (Tambyln, et al., 2002). In a follow-up study, Tambyln, et al. (2007) found that licensure examination scores could be a predictor for patients' complaints. Further research into the subject produces results with weak validity for evidence that correlates licensure examination scores and patient safety and practitioner competence (Archer, et al., 2016). Furthermore, researchers have noted that examination scores are a predictor of the applicant's job location (Kenny, McInnes, & Singh, 2013). When applicants score higher on the exam, they work in locations with a better work environment which is what impacts service quality and customer complaints (Kenny, McInnes, & Singh, 2013).

Both state and national licensing exams are used as means to regulate the profession under the guise of customer protection and worker quality. While licensing exams can help ensure a basic level of competence and protect consumers, its impact on service quality is still unclear (Price, et al., 2018). Prior research has shown that in some instances licensing exams can be a predictor for worker success (Tambyln, et al., 2002). Additional research has identified other reasons, such as job location, as to why licensing exams relates to customer complaints (Kenny, McInnes, & Singh, 2013). Additionally, research on this trend has largely been in relation to the medical industry (Archer, et al., 2016). Boulet and van Zanten (2014) asked for further research into the connection between examinations and service quality. Due to the unclear impacts of licensing examination as part of the application process and the service quality by licensed workers, the requirement to pass an examination will be a part of this analysis.

Training Requirements and Experience Hours

Several occupations require applicants to complete specific amounts of experience hours or on-the-job training requirements. These training requirements can come in the form of apprenticeships or internships (Larkin Jr., 2016). Proponents of this type of requirement for licensure believe that the training hours will enhance the quality of services and protect the public (Kleiner, 2015). Those in favor

of these requirements contend that the requirements should be viewed as investments in individuals in their human capital that will increase their competence (Becker, 1993; Barrios, 2021). Licensing agencies can require applicants to have completed relevant coursework or a set number of training hours prior to licensure to ensure they are prepared for the demands of the job. Even further, licensing administrations can impose narrowly focused training requirement to target a specific skill. For example, if a licensing board wants to increase the communication skills of their workforce, they may require the passage of writing training courses (Barrios, 2021).

Researchers have noted that these types of requirements reduce the labor pool (Knepper, et al., 2022). One analysis examined the impact of changes to the training and educational requirements for certified public accountants. Originally, certified public accountants were required to complete 120 hours as a licensure requirement. This requirement eventually grew to 150 hours. Researchers have noted that this increase reduced the number of applicants by 15% (Barrios, 2021). Furthermore, rigid training hour requirements can create barriers to entry, particularly for individuals from disadvantaged. Additionally, these requirements can artificially inflate the cost of services, making them less accessible to consumers (Larkin Jr., 2016).

In sum, training and experience requirements are often established by licensing agencies for occupational licenses. Proponents of this measure believe these requirements can ensure the applicant has the necessary knowledge and skills to properly perform the job. One study found that this type of training led to a statistically significant increase in service quality (Shen & Tang, 2018). Other studies found that these requirements did not have an impact on service quality (Powell & Vorotnikov, 2012). Since prior research has not been able to produce definitive results, this analysis will examine these requirements as a predictor variable to service quality.

Educational Requirements

A common requirement for an occupational license is to obtain a post-secondary degree (Kleiner & Krueger, 2013). These requirements play an important role in preparing workers to enter their profession by ensuring the workers have the necessary knowledge and practical skills to perform. Educational requirements can have an impact on an employee's job skills (Gallie, et al., 2014). In the medical field, educational requirements and licensing have been linked to better patient outcomes and service quality (Noghanibehambari & Fletcher, 2023). Researchers have noted that broad skills are developed through three systems, educational systems, vocational training, and on-the-job learning (Gallie, et al., 2014). By raising educational requirements, workers will have higher qualifications for entry (Gallie, et al., 2014). This analysis will test the predictive relationship between post-secondary education requirements and service quality through the number of complaints received by licensing boards.

Complaints Against Licensed Workers

Outside of the legal process, the main avenue for a consumer to raise concerns over a licensed worker is to file a complaint to the licensing body that oversees the profession. Once the complaint is received, the licensing agency is required to investigate the complaint and take the necessary action to rectify the issue (Pendo, et al., 2021). To answer the call for additional research into the quality of services, this analysis will do so through the examination of filed complaints against licensed workers.

Measuring service quality through collecting complaints received by licensing boards has been a common method amongst researchers (Shilling & Sirmam, 1998; Frye; 2021).

Synthesis

The theoretical framework for this analysis falls under the public interest theory. This framework contends that licensing agencies act and institute regulations to uphold the public good. More specifically, the application requirements for an occupational license are not intended to be overburdensome. Rather, each of the requirements are intended to ensure worker quality and consumer protection. Since this theoretical framework holds the application requirements are intended to protect the public, the hypothesis for this study contends that there will be a statistically significant predictive relationship between the various application requirements and the number of complaints received against licensed workers.

Previous studies by scholars have examined the licensing requirements being tested in this analysis. Prior research examining background checks as an employment requirement has produced mixed results and demonstrated a research gap (Khan, Hossein, & Imam, 2024). Similarly, researchers have produced mixed results on the relationship between exam requirements and service quality (Price, et al., 2018). Mixed results were also found in prior research studying the effects of training/experience requirements on service quality (Powell & Vorotnikov, 2012; Shen & Tang, 2018). With previous research producing mixed results in this area, this analysis will contribute to the divided field.

Related Literature

Public Administration-Related Literature

Occupational licensing is a regulatory mechanism designed to ensure professional workers meet minimum standards of competency and ethics before they can practice in certain fields. This mechanism has significant implications for public administration, including its enforcement, oversight, and the setting of licensing standards and requirements. Examining occupational licensing through various public administration theories can provide insight into its impact on public administration.

New Public Administration

New Public Management represents a paradigm shift in public administration, emphasizing efficiency, effectiveness, and responsiveness in the public sector by incorporating practices and principles from the private sector (Lapuente & Van de Walle, 2020). Emerging in the late 20th century, New Public Management seeks to address perceived inefficiencies and rigidities in traditional public administration. Furthermore, this shift was in reaction to increased public distrust in public administration. New Public Management arose in response to the challenges faced by governments in the 1970s and 1980s, including economic recessions, increasing public debt, and growing demands for better public services (Rivera & Uttaro, 2021). Proponents of the first occupational licensing framework see licensing as a means to increase the quality of services (Pagliero, 2019). Influenced by neoliberal economic theories and the success of private sector management techniques, New Public Management advocates for a more business-like approach to public administration (Hood, 1991).

While there are several important principles found within the New Public Management theory, four have direct implications for occupational licensing administration and oversight. First, New Public

Management theory emphasizes the need for public administration to hold itself accountable based on performance measurements (Hood, 1991). Under New Public Management, leaders must outline "explicit performance standards" (Lodge & Gill, 2010, p.142). As it relates to occupational licensing, performance standards to earn a license must be explicitly outlined by the public administration in charge of the license. Furthermore, licensing administrations have the autonomy to update their licensing requirements to ensure the performance standards of their licensed workers are being met.

One of the most important aspects of the relationship between New Public Management theory and occupational licensing is New Public Management's focus on marketization. The principle of marketization in New Public Management theory emphasizes the introduction of market mechanisms into the public sector to enhance efficiency, reduce costs, and improve service delivery (Voorn, Van Genugten, & Van Thiel, 2020). With this, New Public Management theory harnesses the importance of public administration's working with and influencing the market rather than completely abstaining from the economic market. This involvement in the economic market is a vital factor for administering occupational licenses. Licensing administrators and licensing boards can change the requirements for licensure depending on the market and the needs within their state. This ability allows the administrators to restrict the labor market for the licensed occupation in their state by a significant amount (Blair & Chung, 2019). When licensing administrators increase the difficulty in obtaining a license, they can reduce the number of workers in the state (Barrios, 2021). This increase in difficulty can lead to discrimination (Buonanno & Pagliero, 2020). Furthermore, administrators can reduce the barriers surrounding licensure and attract new workers into their state (Sindelar et al., 2007). This ability of licensing boards and administrators to purposefully impact the market falls within the principles of New Public Management theory.

While the notion of marketization is an essential internal characteristic of New Public Management theory, an important external principle of this theory is the idea of customer orientation and customer sovereignty (Funck & Karlsson, 2020). In response to comprehensive criticism, public administration turned to the New Public Management style to increase the quality of service and bolster customer satisfaction (Singh & Slack, 2022). By viewing citizens as customers, New Public Management in public administration emphasizes the importance of meeting citizens' needs as if they are paying customers to a private business. This viewpoint is important as it relates to the practices surrounding occupational licensing. Licensing boards and agencies are tasked with ensuring proper levels of service for their citizens. Under the New Public Management, these citizens are viewed as customers. By enforcing licensing standards and regulations, these licensing administrators can attempt to ensure higher levels of services for these citizens. Under this theory, the quality of services would be more important than the perceived barrier to entry caused by occupational licensing and its requirements.

An additional aspect of the New Public Management model in public administration is the idea of public services (Endeki & Minja, 2021). Here, public services are decentralized and performed through decentralized units (Endeki & Minja, 2021). Occupational licensing fits well within the concept of decentralization, as the licensing agencies and administrators are found at the state and local level rather than one centralized administrator. Decentralizing public services increases efficiency and brings the services closer to the consumer (Kurnia, 2012).

Bureaucratic Theory

Max Weber formulated his bureaucratic theory during the late 19th and early 20th centuries. This time period included rapid industrialization and the expansion of governmental and corporate institutions. Weber aimed to identify the most efficient and rational form of organization for managing complex societies. He believed traditional forms of authority were insufficient for the needs of modern, large-scale enterprises. This theory has been cited throughout public administration research (Kettl, 2022). Public administration involves thousands of public agencies and governments of various sizes. In 2023, the number of federal employees is nearly 3 million. Additionally, more than nineteen million people work for state and local governments in the United States. These numbers show the large-scale enterprise which is modern public administration.

Weber's bureaucratic theory includes six important components. These are hierarchical structure, division of labor, formal selection, formal rules and procedures, impersonality, and merit-based advancement (Dash & Padhi, 2020). Weber believed a bureaucracy should be structured hierarchically with distinct levels of authority. This structure would allow directives and decisions to flow in one direction and increase efficiency. These hierarchical governance systems thrived in public administration during the Progressive Era (Langer, 2022). With occupational licensing, this concept is prevalent. Here, licensing boards are at the top of the hierarchy, and the licensing board determines all decisions surrounding the licensing requirements.

The formal rules and procedures aspect of Weber's theory contends bureaucracies should operate based on determined rules and regulations (Tribe & Weber, 2019). For occupational licensure, these rules and regulations are typically developed through an internal rulemaking process where licensing administrators and licensing boards work together to determine the requirements for licensure, the formal complaint process against licensed workers, and the application process.

Another important aspect of Weber's bureaucratic theory is merit-based advancements. Here, Weber contends employees should be selected and promoted based on their qualifications and performance (Dash & Padhi, 2020). Public administrators have been highly successful in codifying meritocratic ideals (Langer, 2022). Doing so can reduce the scope of nepotism within public administration (Dash & Padhi, 2020). The concept of meritocracy can be found during the occupational licensure application process. Using this theory, applicants should receive a license strictly based on their merit. Through the normal application process, the licensing administrations can determine their own definition of merit and develop their own merit requirements to fulfill this definition. Researchers have shown some requirements set forth in the application process can discriminate certain population groups (Blair & Chung, 2021).

While Weber's bureaucratic theory gained traction among public administration researchers, it did receive arguments against it for the public sector (D'Anselmi, 2020). Here, critics argue bureaucratic theory is not flexible enough in nature. This inflexibility can hinder an administration's ability to innovate and respond to new practices. Furthermore, this theory can lead to the creation of more "red tape." Here, unnecessary rules and regulations can slow down the decision-making process and lead to inefficiency. Both criticisms can be seen through the lens of occupational licensing and its reforms.

Public Administration Influence on the Economy and Labor Markets

The economy and the labor market have high levels of influence on each other. The economy can change the demand for certain goods and services. One study found when national stock prices increase, the impacts trickle down to local labor markets as local employment and payroll increase (Chodorow-Reich, Nenov, & Simsek, 2021). When the demand for a good or service changes, the labor market must adapt to meet this new demand. The inverse is true as well. When there is a drop in demand, the labor market in this industry will be reduced. The notion of public administration engaging in the labor market in these ways is supported by the New Public Management Theory (Voorn, Van Genugten, & Van Thiel, 2020). During a recession, different labor markets are impacted in different ways. There are demand side and supply side reasons as to why the pattern of employment changes during recessions (Albanesi &Kim, 2021). Demand side occupations tend to be more resistant to economic changes (Albanesi, 2021). If a licensed occupation falls on the demand side, economic recessions may have a smaller impact on this profession. If a licensed profession is on the supply side, it is more susceptible to changes in the economy.

This was not the case during the COVID-19 pandemic and the subsequent recession. During the pandemic, government regulations, demand for labor, and workers' willingness to work impacted the labor markets the most (Khamis, et al., 2021). Here, the differences fell based on the contact level of the profession (Albanesi, 2021). Meaning licensed jobs with high contact rates, such as non-critical healthcare professions and personal care services, saw greater unemployment rates than licensed jobs with low contact rates, such as contractors and accountants (Albanesi, 2021). This difference highlights the impact the nation's economy can have on various labor markets and licensed occupations within them.

Outside of economic shifts, there are a variety of ways in which public administration can impact the labor markets within their state. These regulations include benefit standards, unionization regulations, and workplace safety regulations. Governments have implemented right-to-work laws, which can negatively impact the workers' ability to form unions and enter into collective bargaining agreements. These right-to-work regulations are products of state-level decision making. States with right-to-work laws see a 13% reduction in unionization rates (Dasgupta & Merchant, 2023). These impacts remain over a prolonged period of time (Ellwood & Fine, 1987). Researchers contend unionization and right-to-work laws must be examined in conjunction with each other rather than separate issues (Dasgupta & Merchant, 2023).

The impact of unionization and unionization policies has been a well-researched area for scholars. In non-right-to-work states, unionization rates are high in public administration (Fortin, Lemieux, & Lloyd, 2023). Furthermore, unions can negotiate higher wages and additional benefits within public administration. Researchers have found unionization can limit employment rates (Centeno & Nova, 2014). Similar to licensing, this aligns with social and occupational closure theories. The introduction of unionization can increase the wages of unionized workers (Branchflower & Bryson, 2004). Following unionization, both average employee compensation and employer pension contributions increase (Knepper, 2020). This increase means unions set wages while the employers set employment (Branchflower & Bryson, 2004).

Researchers have also found unionization can raise the unemployment rates of young men and prime-age women compared to prime-age men (Bertola, Blau, &Kahn, 2023). Not only does unionization influence wage premiums and employment levels, but it can also impact employee satisfaction. Since

unionization can lead to better working conditions and a higher salary, job satisfaction increases with unionization (Diaz-Carrion, Navajas-Romero, & CasasRosal, 2020). Research has proven job satisfaction has the highest influence on employee retention rates (Iqbal, Guohao, & Akhtar, 2017). Therefore, when state and local governments change their union policies and laws, the effects can impact the unionized workers and the excluded workers in the out-groups who are unable to enter the occupation.

Occupational Licensing-Related Literature

Occupational licensing is one of many instruments the public sector uses to influence the labor market and the economy. Therefore, there must be an understanding of how occupational licensing fits within the dynamic relationship between the public sector and the labor market. This is important for this analysis as the impact on the labor market can influence the number of new workers a state receives when loosening licensure requirements. If occupational licensure does not impact the labor market, there will be no changes to the services being provided and the licensing administration's ability to oversee service quality as the labor force would remain the same.

While occupational licensing is just one of many ways the public sector can influence the labor market, licensing is a valuable tool for state-level public agencies. Importantly, under various public administrative theories, public administration can engage in the markets and adjust their processes in response to the market (Hansen, Lindholdst, & Greve, 2019). When a licensing agency feels the need to restrict entry into the profession, they may raise the burden of entry (Buonanno & Pagliero, 2020). When the barrier to entry is high, it can act as a form of discrimination (Decker, 2021).

Occupational oversight dates back to 1780 BCE with the Babylonian Code of Hammurabi (Kleiner, 2006). This Code of Hammurabi required fees for medical patients and fines for practitioners who committed negligence during treatment (Kleiner, 2006). This Babylonian Code acted as a measure intended to protect consumers and ensure high-quality medical services. Occupational licensing literature in the United States can be found dating back to Adam Smith's Wealth of Nations, which was published in 1776 (Kleiner, 2000). Here, Smith highlighted the ability of craftsmen to lengthen apprenticeship programs while also limiting the number of apprenticeship programs. According to Smith, these measures were used to raise the earnings of those within the occupation (Kleiner, 2000). These types of findings paved the way for the first framework surrounding occupational licensing research and the overall growth of occupational licensing in the United States.

Licensing as a Form of Necessary Protection

Proponents of occupational licensing contend licensure acts as a form of quality control which is necessary for consumer protection (Pagliero, 2019). Under this framework, researchers noted occupational licensing increases the quality of services in a variety of ways (Pagliero, 2019). First, several types of licensing include the passage of an examination. Importantly, the testing requirement can be found in both high-skilled and low-skilled occupations (Carpenter, et al., 2015). This examination process can be used to ensure workers have the skills and the technical knowledge to perform the job properly (Carroll & Gaston, 1983). Occupational licensing regulations may also require applicants to have proper moral character (Carroll & Gaston, 1983). This requirement can include the disclosure of previous crimes. Disclosure can help ensure licensees are of good moral character (Gray, 2021). Finally, licensing requirements may include continued education and training (Carroll & Gaston, 1983). This continued

education or training requirement can allow licensing administrations to ensure licensed workers maintain their skills and knowledge even after earning their initial licensure.

Moreover, occupational licensing can increase the quality of services by reducing the number of low-quality workers (Caldwell, Freeman, & Smith, 2018). The benefits of occupational licensure on the improvement of markets and services peaked during the Progressive Era (Law & Kim, 2005). During this time, workers began to specialize in a profession due to certain licensing requirements passed by the government (Law & Kim, 2005). This occupational licensing framework fits well within the public interest theory as this theory contends these public agencies work to ensure community safety and consumer protection (Chambers & O'Reilly, 2021).

Consumer Choice

An additional benefit of occupational licensing is licensing can minimize consumer uncertainty. Occupational licensing has been found to have an impact on consumer choice (Farronato, 2020). When state agencies grant someone an occupational license, the state board is reassuring the consumer the licensee has the necessary skills, knowledge, and character to perform the task at hand (Gray, 2021). This can bring a level of confidence for a consumer when they are deciding to purchase a good or service. When given a choice between a licensed employee and a lower cost for the service, consumers are more likely to choose the cheaper service even if it means the service is being conducted by an unlicensed professional (Farranato, et al., 2024). Even further, these licenses can even help with the choices made by the businesses themselves. Small businesses and companies may not have the necessary resources and financial means to properly vet every candidate they hire (Gray, 2021). In these types of instances, the occupational license serves as the vetting process for these small businesses (Gray, 2021). In sum, Jeffrey Gray supports the modern increase in occupational licensing regulations. Here, Gray (2021) differs from other scholars and contends occupational licensing in its current form is still a necessary public administrative oversight practice and recommends maintaining the status quo for state-level licensing practices and requirements.

Wage Premiums for Licensed Workers

One of the most cited perceived benefits surrounding occupational licensing is the benefits directly received by the workers themselves (Kim & Chatterji, 2020). The most important benefit associated with the presence of an occupational license for a profession is the wage premium it provides for licensed workers (Haupt, 2023). The wage premium associated with occupational licensing can be attributed to two factors. First, the increased quality of services can increase wages (Chen, Franko, & McGrath, 2024). Second, reducing the number of available workers can create a labor restriction within the specific field (Kleiner & Krueger, 2010).

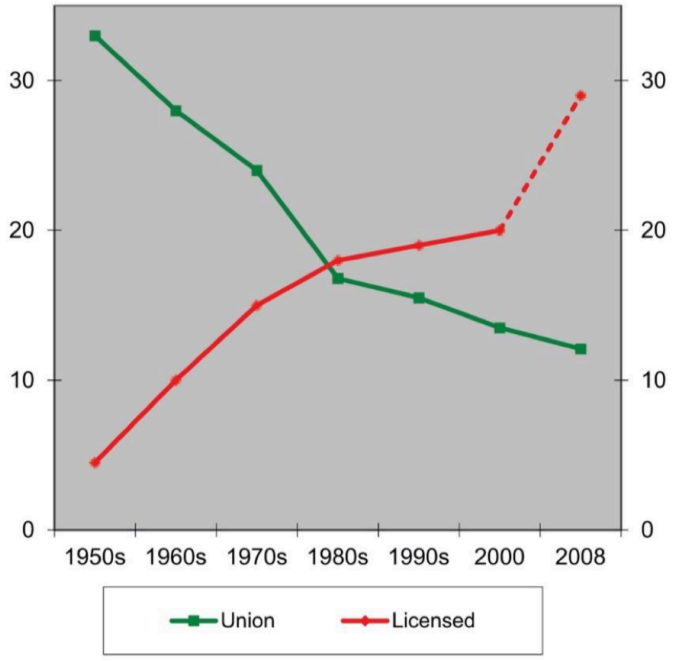
While researchers agree the presence of an occupational license increases the wages for workers who are licensed, they have found mixed results for the amount of increase occupational licensing can provide. Research has tended to focus on single industries when examining the increase in wages. One study examining massage therapists found once the profession became licensed, wages increased by 16.2% (Thornton & Timmons, 2013). In the funeral service industry, occupational licensing was attributed to an 11%-12% wage premium (Pizzola & Tabarrok, 2017). When researchers attempted to examine the relationship between occupational licensing and wage premiums, they found mixed results (Liang, 2022). On the low end, one study found occupational licensing attributed to just a 7.5% wage

premium across multiple occupations (Gittleman, Klee, & Kleiner, 2015). Previous research has found the wage premium to be near 15% for those licensed occupations (Kleiner & Krueger, 2010). This disagreement amongst scholars shows the complexity of occupational licensing research as well as the need for continued research.

Researchers have noted the effects of occupational licensing on wage premiums mirror the effects of unionization (Kleiner & Krueger, 2010). This is an important aspect of occupational licensing, as unionization can have substantial economic effects. If an occupation is subjected to both an occupational license and unionization, the wage premium can reach 24% (Kleiner & Krueger, 2010). Importantly, researchers have noted that as occupational licensing rates increased, unionization levels have decreased (Gittleman & Kleiner, 2015). As seen in Figure 4, following 2015, licensure rates have surpassed unionization rates (Gittleman & Kleiner, 2015). Therefore, administrative decisions that involve occupational licensure may impact a higher number of workers. While scholars may disagree on the actual amount of wage premiums occupational licensing is responsible for, they do agree that occupational licensing is responsible for these increases (Haupt, 2023).

Figure 4

Occupational Licensing and Unionization Rates in the United States



Note. This chart highlights the shift between unionization rates and occupational licensing rates. From Kleiner, M. & Krueger, A. (2013). Analyzing the extent and influence of occupational licensing on the labor market. *Journal of Labor Economics, 31*(1), 173-202.

Worker Protection and Benefits

Importantly, occupational licensing is accountable for more benefits to the worker beyond just a wage premium. More specifically, occupational licensing has been associated with an increased probability of workers working full-time and year-round (Kim, 2020). Ultimately, this study found that licensed workers were able to work more hours than unlicensed workers (Kim, 2020). Even further, occupational licensing raises the probability of employment for licensed workers (Gittleman, Klee, & Kleiner, 2015). Therefore, licensed workers are more likely to be employed and work more hours than non-licensed employees.

The final impact occupational licensing has on the licensees themselves is the job-related benefits. Gittleman, Klee, and Kleiner (2015) have been able to show that those with an occupational license have a higher probability of receiving employee-sponsored health benefits (Gittleman, Klee, & Kleiner, 2015). Even further, the presence of an occupational license can increase the likelihood of receiving a retirement savings plan from their employer (Kim, 2020). One explanation for this increase in benefits is that occupational licensing allows licensees a greater ability to dictate where they work (Kim, 2020). As it relates to the licensees themselves, occupational licensing can increase wages, increase the number of hours they work, and provide greater benefits as compared to similar non-licensed employees.

Previous research has been able to show that occupational licensure can positively influence labor market outcomes for historically disadvantaged workers as the license signals a worker's quality (Law & Marks, 2009). Even after controlling gender and race, research has shown that wage premiums still exist (Blair & Chung, 2019). Additionally, previous research has shown that these wage premiums are found among workers without a college degree (Kim & Chatterji, 2020). These findings highlight the broad impact of occupational licensing on wage premiums. These premiums can be found in both high and low-skilled professions as well as across the intersections of gender and race (Witte & Haupt, 2020).

Reciprocity

State level licensing administrations have entered into reciprocity agreements with each other. These agreements can be used to loosen the barrier to entry for previously licensed employees entering the state (Adams & Timmons, 2024). These agreements allow the administrative agencies within the states in the pact to recognize a license from each other and streamline the administrative process. More specifically, they allow a worker with a license in one state to obtain a license in a different state without having to go through the entire application process (Adams & Timmons, 2024). On an administrative level, these agreements change the process for approving occupational licenses for licensing agencies and administrators by creating a unique avenue for licensure for applicants with an out-of-state license. Reciprocity agreements are typically regional in scope and are usually found between states who share borders These agreements are usually occupation-specific and are intended to facilitate labor mobility, allowing workers to move from states with labor surpluses to those experiencing shortages. (Sindelar et al., 2007). Therefore, reciprocity agreements are a way for states and their agencies to influence their labor markets and economies. Critics of reciprocity agreements and compacts believe that these agreements can undermine the states' ability to regulate the practice (Dohen, 2017).

Licensing as a Barrier to Entry and Form of Administrative Discrimination

More recent research has fallen under the framework that occupational licensing restrictions have become an unnecessary barrier to entry and can discriminate against various groups (Buonanno & Pagliero, 2020; Decker, 2021). Importantly, occupational licensing has grown significantly since the end of World War II (Kleiner, 2006). Not only has the number of licensed occupations grown, but the licenses themselves have become harder to attain (Kleiner, 2017). One study tracked the average requirements for licensure for 102 licensed occupations in the United States (Knepper, et al., 2023). These occupations ranged from low-income professions to mid-income professions. By removing high-income professions, scholars prevented the requirements for the medical professions from skewing their findings. In 2012, a study found that the average cost of a license was $209 in fees, the passage of one exam, and nine months of education or training (Carpenter II, et al., 2015). Three years later, in 2015, the average cost of licensure amongst those same professions was $267 in fees, the passage of one exam, and one year of education or training (Carpenter II, et al., 2017). The most recent findings show that the average cost of an occupational license in those professions is $295 in fees, 362 days of education or training, and the passage of one exam (Knepper, et al., 2023). Even as states have taken measures to reduce licensure, the burden of entry has not only remained but increased over time (Knepper et al., 2023). Even with this reduction, the number of applicants who face discrimination through the application process is around 49% (Buonanno & Pagliero, 2020). This notion is supported by the regulatory capture theory, which posits that these licensing administrations can use their oversight of the profession to increase the benefits and wages of workers already in the profession who possess a license (Brown, 2022).

Impact on the Consumer Following Morris Kleiner's 2006 work, recent research contends that occupational licensure creates a burden. Scholars have examined the burdens placed on the consumer as well (Mysicka, Cutler, & Zhang, 2020; Farronato, Fradkin, & Larsen, 2024). Once an occupation is licensed, the cost of services and goods can increase between 3%-16% (Kleiner, et al., 2016).

Occupational licensing is intended to raise the quality of services, which will then, in turn, allow the licensee to charge higher rates for those serviced (Kleiner, 2017). These rises in the cost of services have been found to directly raise the cost of wages (Kleiner, 2017). These rises in costs mean that these wage premiums can be passed onto the consumer. When an occupation is delicensed, the prices for those goods and services fall (Pizzola & Tabarrok, 2017). Therefore, occupational licensure has a direct impact on the costs that consumers face for goods and services. This impact highlights the delicate balance between keeping services affordable for consumers while maintaining the overall quality of the services.

Even further, occupational licensing can impact consumer choice. A study of the funeral services industry found that licensing not only increased prices but pushed consumers away from cremation and towards more expensive burial services (Pizzola & Tabarrok, 2017). One study found that when prices increased due to licensure, consumers looked for a substitute for the regulated service (Adams, Jackson, & Ekelund, 2017). Therefore, licensing can have a vital role in consumer choice and has trickle-down effects on the consumer.

While proponents in favor of occupational licensure in the first framework contend that occupational licensure increases the quality of services, more recent research tends to suggest that licensure does not always increase the quality of services (Pagliero, 2019). A study on florists found that the quality of floral arrangements throughout the state of Louisiana, where florists are subjected to

occupational licensure, were not higher than the floral arrangements in Texas where florists are not licensed (Carpenter, 2012). Recent research has begun to examine the impact on the quality of services when licensure becomes more difficult. One study found that when the educational requirements increased for licensure, the quality of services did not increase from the certified public accountants (Barrios, 2022). These findings push back against the belief that licensing increased the quality of services (Anderson, et al., 2020). With different studies showing mixed results, it is still a critical area of study for future research.

Labor Market Restrictions

One of the most studied aspects of occupational licensing effects is its impact on the labor market. Most importantly, occupational licensing has a direct impact on the labor supply of an occupation. This reduction of labor can be attributed to the barrier to entry into the profession (Carpenter II, et al., 2017). Kleiner and Vorotnikov (2017) contend that this barrier to entry is responsible for between 1.8 million and 1.9 million fewer jobs in the United States. Within an occupation, Blair and Chung (2019) hold that the labor supply can be reduced by 17%-27% with the introduction of licensure. Labor constriction can be found even when occupations are partially licensed (i.e., certification). More specifically, these partially licensed occupations grew 20% slower than unlicensed professions (Kleiner, 2006). Importantly, licensing boards themselves have been known to increase the licensure restrictions if they perceive there is an oversupply of labor within their state (Maurizi, 1974). For certified public accountants, when states instituted the 150-hour rule, which increased the number of educational hours required for licensure, the number of certified public accountants was reduced (Barrios, 2021).

Interstate Migration

While occupational licensing can restrict the number of new workers in the profession, it can also restrict the movement of those who already hold a license (Kleiner, 2015). While occupational licensing contributes to a reduction in interstate mobility and migration, the causation can be different between high-skilled occupations and low-skilled occupations. The reduction in migration among high-skilled employees can be attributed to state-specific exams (Pashigan, 1979). In comparison, the reduction in interstate migration among low-skilled employees can be attributed to additional training hours (Federman, Harrington, & Krynski, 2006). Overall, occupational licensing can limit interstate migration among workers by up to 36% (Johnson & Kleiner, 2020). One study found that if states reduce their occupational licensing requirements, they can increase migration into the state by as much as 6.5% (Mullholland & Young, 2016). Furthermore, once Alabama rescinded its licensing requirements for barbers, the number of barbers moving into the state increased (Timmons & Thornton, 2016).

To offset the labor shortages some states face, and to reduce the burden of entry, licensing administrations may engage in reciprocity agreements. These reciprocity agreements allow states to recognize each other's licenses and do not force citizens entering their states to apply for new licensure. Rather, they apply to have their license recognized by their new state through an expedited administrative review process. By introducing reciprocity agreements into their states, licensing agencies attempt to maintain the government oversight found with licensure while also relieving some of the burdens of the licensure process (Hogan, 1983). These reciprocity agreements can minimize the negative effects surrounding occupational licensing. One study examining the role of reciprocity and the ability of

professional nurses to migrate among states found that reciprocity laws increased the number of nurses crossing state lines by 11% (Shakya, Ghosh, & Norris, 2022).

Methodology

The purpose of this quantitative analysis is to examine whether public administrators are effectively fulfilling their role in ensuring that workers are adequately prepared to enter their respective professions and deliver quality public service. Under the public interest theory, public administrators impose licensing requirements that preserve the public good. The dependent (outcome) variable in this analysis is the number of complaints received by licensing agencies, measured per 1,000 licensed practitioners. The independent (predictor) variables include the successful completion of state or national examinations, fulfillment of mandated experience or training hours, attainment of a post-secondary degree, and compliance with background checks. The target population for this study comprises of occupational licensing agencies operating within the state of Arizona. Data will be collected directly from these agencies for a 36-month period spanning January 1, 2021, through December 31, 2024.

Design

Quantitative research methodologies encompass experimental, quasi-experimental, and non-experimental designs (Mohajan, 2020). This study will employ a non-experimental research design, which is suitable when the researcher does not manipulate the independent variable (Jhangiani et al., 2019). In non-experimental research, the researcher does not exert control over the variables but rather observes and analyzes naturally occurring relationships among them (Johnson, 2001). Although non-experimental designs do not involve manipulating variables, non-experimental research remains a valuable and rigorous approach to exploring relationships within existing data (Price, Jhangiani, & Chiang, 2015). Given that the independent variables in this study will not be subject to experimental control, a non-experimental design is deemed most appropriate for this analysis.

Non-experimental research designs can be further categorized into subtypes such as descriptive, causal-comparative, and correlational approaches (Johnson, 2001). While causal-comparative and correlational designs possess several methodological similarities, their primary distinction lies in their purpose (Gay & Airasian, 2000). Causal-comparative research seeks to identify potential cause-and-effect relationships, whereas correlational research focuses on examining associations between variables and making predictions based on those relationships (Johnson, 2001). Because this study will use multiple linear regression to explore the predictive relationship between various occupational licensing requirements and the number of complaints received by licensing boards, it aligns with a correlational non-experimental design.

Multiple linear regressions have been used by previous scholars examining various aspects of occupational licensing (Teague, 2022; Valentin, Najamabadi, & Honda, 2021). A similar analysis to this proposed study, performed by Megan Teague (2022), used a multiple linear regression design to examine the correlation between barriers to enter a licensed profession and the exit and entry rates of the profession. While Teague's analysis looked at variables outside of the occupational license requirements, the analysis does validate the ability of a multiple linear regression to predict occupational outcomes.

Research Question

Central Question: Is there a significant predictive relationship of service quality (*complaints*) from the occupational licensing requirements to pass a national examination (*ntlexam*), statewide examination (*stexam*), fulfilling training or experience requirements (*experience*), satisfying educational requirements (*educ*), and the passage of a background check (*bgcheck*)?

Hypotheses

The hypotheses in this study are informed by existing scholarly research and grounded in the theoretical framework presented in the previous chapter. Public interest theory suggests that licensing is established by regulatory agencies to serve the broader public good (Thomas & Thomas, 2022). According to this perspective, licensure requirements are intended to protect consumers and uphold the quality of services provided (Barrios, 2022). Based on this theoretical foundation, the hypotheses in this study propose that specific licensure requirements have a direct influence on service quality outcomes.

With regard to examination requirements, previous research suggests that licensure exams establish a baseline level of knowledge necessary to help ensure service quality (Archer et al., 2016). Similarly, studies have shown that educational attainment and required training hours represent valuable investments that can enhance worker competence (Becker, 1993; Barrios, 2021). Educational requirements have been linked to improved job-related skills and performance (Gallie et al., 2014). In addition, the implementation of background checks has been cited as a mechanism to verify good moral character and protect the public from potentially harmful behavior (Decker, 2021; Carollo et al., 2022). As such, the hypotheses in this study are grounded in existing research that has explored these variables in related contexts.

> **$H_0$1:** There is no statistically significant predictive relationship of service quality (*complaints*) from the occupational licensing requirements to pass a national exam (*ntlexam*), statewide exam (*stexam*), fulfilling training or experience requirements (*experience*), satisfying educational requirements (*educ*), and the passage of a background check (*bgcheck*)?

> **H_a1:** Ha1: There is a statistically significant predictive relationship of service quality (complaints) from the occupational licensing requirements to pass a national exam (*ntlexam*), statewide exam (*stexam*), fulfilling training or experience requirements (experience), satisfying educational requirements (*educ*), and the passage of a background check (*bgcheck*)?

Participants and Setting

The population for this study consists of occupational licensing administrations operating within the state of Arizona. Based on calculations using a sample size calculator, 26 licensing boards will be selected to participate. A random sampling method will be employed to determine which boards are included. One of the key advantages of random sampling in quantitative research is its ability to enhance the representativeness of the sample, thereby improving the generalizability of the study's findings to the broader population (Noor, Tajik, & Golzar, 2022). By providing each member of the population an equal chance of selection, random sampling reduces selection bias and contributes to the validity of statistical inferences, ultimately strengthening the credibility of the study's conclusions (Noor, Tajik, & Golzar, 2022). Licensing boards that oversee multiple professions with differing licensure requirements will be

excluded from the sample to ensure consistency in the analysis. The use of randomized sampling in this analysis will allow the results of this study to be generalized to the entire state of Arizona.

The timeframe for this analysis spans from January 1, 2021, to December 31, 2024, providing a 36-month period for data collection and analysis. This period was selected to avoid potential misrepresentations caused by the COVID-19 stay-at-home orders. To account for the COVID-19 pandemic, this analysis will collect data beginning in 2021. Governor Doug Ducey of Arizona issued Executive Order 2020-18. This executive order was a stay-at-home order that asked citizens to stay at home and closed a variety of non-essential businesses. This stay-at-home executive order was issued on March 31, 2020, and lifted on May 16, 2020, with the issuance of Executive Order 2020-36. Previous research examined the impact of the COVID-19 pandemic on interstate migration rates in the United States. During the initial COVID-19 outbreak, the number of state-to-state moves was 15.1% lower than pre-pandemic rates (Lavelle & Kepner, 2022). Furthermore, the stay-at-home order reduced the number of services being provided. The timeframe selected for this analysis ensures the data reflects more typical regulatory and professional conditions. Data will be obtained through a review of meeting minutes from the licensing administrations, as well as through public records requests submitted to these agencies.

Quantitative research literature recommends collecting a minimum of 10 observations for each independent variable to ensure adequate statistical power and reliability (Pesamaa et al., 2021). Based on sample size calculations, this study will include data from 26 licensing boards, which meets the recommended threshold for each independent variable included in the analysis. The dependent variable in this study is the number of complaints received by licensing administrations per year for the three-year period. These data will be collected over a 36-month period, providing a sufficient amount of information for analysis.

Data Collection

Kleiner and Vorotnikov (2017) noted that "occupational associations, such as the American Bar Association and the American Dental Association, have started collecting wage and salary data as well as the number of new entrants and pass rates by state as early as in the 1980s" (p. 134). These findings highlight that licensing agencies and professional associations have historically gathered data related to licensure. Because state licensing boards routinely track application and examination data, such information is accessible through public records requests. Since this study focuses exclusively on one state, it is more appropriate to use data directly from Arizona's licensing boards rather than relying on national datasets or surveys. This targeted approach is one of the key advantages of conducting a state-level rather than a nationwide analysis. Furthermore, scope of practice regulations for licensed occupations differs considerably across states, resulting in substantial variation in the tasks, responsibilities, and authorized activities professionals may legally perform based on their geographic location. Notably, even when individuals possess identical licensure credentials, the specific functions they are permitted to carry out can vary significantly from one jurisdiction to another (Kleiner, 2015).

The primary data collection method for this study will be secondary data analysis. This methodological approach involves the utilization of existing data originally gathered by other entities for purposes distinct from the current research objective (Johnston, 2014). Government agencies, including occupational licensing boards, maintain extensive publicly available datasets that can be repurposed for scholarly analysis (Vartanian, 2006). Secondary data analysis has been widely recognized as a valid and

methodologically sound approach within social science research (Johnston, 2014). For the purposes of this study, data compiled and maintained by public licensing administrations will be extracted and integrated to construct a comprehensive dataset for empirical analysis.

Numerous studies have employed public records requests as a means of obtaining data directly from public agencies (Oltmann et al., 2015). Notably, Lee (2001) found that approximately one percent of all federal public records requests were submitted for academic research purposes. In the context of occupational licensing, the use of records requests to obtain licensure-related data directly from regulatory boards is a well-established methodological approach. Several studies have utilized this technique to access agency-generated information pertinent to licensing practices and regulatory requirements (Carpenter II et al., 2015; Carpenter II et al., 2018; Knepper et al., 2023).

Instrumentation

This study will include five independent variables: the requirement to pass examinations, the completion of specified training or experiential benchmarks, attainment of a post-secondary degree, and the submission of fingerprints. These variables will be measured nominally. Nominal levels of measurement allow researchers to code qualitative variables (Bhandari, 2022). The dependent variable will be the number of complaints filed against licensed professionals, as recorded by the respective licensing administrations. This variable will be measured as a ratio level of measurement. Ratio levels of measurement are the highest levels of measurement as it includes a true zero point (Bhandari, 2022). Data will be compiled and analyzed using IBM's Statistical Package for the Social Sciences (SPSS), which will be used to construct the dataset and conduct a multiple linear regression to address the study's central research question. Since multiple linear regressions assume the variables are continuous (James et al., 2023), the nominal independent variables in this analysis will be dummy coded.

Number of Complaints

In this study, the number of complaints received by each occupational licensing board serves as the dependent variable. Public licensing administrations are tasked with the critical responsibility of regulating professional conduct and ensuring that licensed practitioners adhere to standards that promote public safety and consumer protection (Barsky, Carnahan, & Spadola, 2021). Proponents of occupational licensing contend that occupational licensure is a necessary form of protection for the consumer. Here, licensure acts as a government stamp of approval for the quality of the service. By requiring an occupational license, state governments can remove unqualified workers and oversee the necessary requirements. By doing so, occupational licensing attempts to raise the quality of services.

To assess the impact of licensure requirements on service quality, this study will adopt a quantitative approach using a ratio level of measurement by examining the number of formal complaints filed with state licensing agencies. Licensing boards maintain established procedures through which consumers can submit complaints electronically against licensed professionals (Chung, 2020). Upon receipt, the licensing agency reviews the complaint, initiates an investigation, and, if necessary, implements corrective actions to address the identified issue (Pendo et al., 2021). The use of consumer complaints submitted to licensing boards as a means for measuring service quality has been well-documented in previous literature (e.g., Shilling & Sirmans, 1988; Thomas, 2005; Rothke et al., 2021). To ensure comparability across agencies, the number of complaints will be reported per 1,000 licensed practitioners. Meeting minutes for each of the participating licensing board's meetings from January 1,

2021, to December 31, 2024, will be analyzed and the number of complaints initial review of complaints will be recorded. The total number of complaints received during the three-year study period will be divided by the number of current active licenses.

Exams

One of the independent variables in this study is the requirement to pass a licensing examination. Licensing boards may mandate the successful completion of a state-specific jurisprudence exam or a nationally standardized certification exam as a condition for licensure. These requirements are publicly available and typically outlined in the application materials provided on each licensing administration's official website. For the purposes of this analysis, the presence of an exam requirement will be documented and included as a variable in the dataset. These variables will be treated as nominal levels of measurements. Licensing exams can differ greatly between licensing boards. Some licensing exams can be written examinations, others can be multiple choice questions, others can be interviews in front of the board. By treating the examinations as nominal variables, this analysis will treat the different examination types equally. If licensing boards do not require the applicant to pass a state jurisprudence exam, it will be dummy coded as a "0" in SPSS. If the licensing boards do require the passage of a state jurisprudence exam, it will be dummy coded as a "1" in SPSS. The same process will be used for national examinations.

Training and Experience Requirements

Licensing boards may require applicants to have successfully completed a certain number of training hours or have other experience requirements. Here, the applicant can complete supervised training. This can either be a part of an educational degree program or as a standalone requirement. These requirements are posted on the application packet on the licensing board's website. If the application requires an experience or training requirement, it will be recorded and tested for this analysis. These training and experience requirements will be measured nominally. If licensing boards do not require the applicant to fulfill any training or experience requirements, it will be dummy coded as a "0" in SPSS. If the licensing boards do require training or experience, it will be dummy coded as a "1" in SPSS.

Education Requirements

Licensing boards may mandate the completion of specific post-secondary degree programs as a prerequisite for obtaining an occupational license. These educational requirements are typically outlined on the official websites of the licensing boards or detailed within the application materials. Since this analysis is testing an educational threshold, this variable will be measured nominally. For the purposes of this study, any licensure application that specifies the completion of a post-secondary degree as a condition for licensure will be recorded and included as an independent variable in the analysis. Post-secondary education requirements will be dummy coded as a "1" in SPSS. If the licensing boards do not require post-secondary education, it will be dummy coded as a "0" in SPSS.

Fingerprinting Requirements and Background Check Requirements

Some licensing administrations require applicants to undergo a background check as a condition for obtaining an occupational license. In certain cases, this process involves the submission of fingerprint samples directly to the licensing board as part of the application procedure, with licensure contingent upon successful completion of the background check. Alternatively, some boards require applicants to obtain and submit background check results independently as part of their application materials. Since

there is no hierarchical order, this variable will be measured nominally. For the purposes of this study, the presence of either type of background check requirement will be documented and included as an independent variable in the analysis. If the licensing board requires the passage of a background check or the submittal of fingerprints, it will be dummy coded as a "1" in SPSS. If the licensing board does not have this requirement, it will be dummy coded as a "0".

Procedures

The first step of the data collection for this analysis will be to identify all occupational licensing boards operating in the state of Arizona. Once identified, a public records request will be submitted to each board to obtain the number of actively licensed professionals under their jurisdiction. This information will be used to transform the dependent variable into the number of complaints per 1,000 licensed workers. Scholars have recognized public records requests as an effective method for conducting archival research on governmental activity (Greenberg, 2016, p. 11).

The next step will be to review meeting calendars available on the public websites of the identified licensing boards to determine the total number of meetings held between January 1, 2021, and December 31, 2024. The fourth step is to use a sample size calculator and an n-quota pretest to ensure the sample size is sufficient to confirm that the findings will be generalizable and to confirm for statistical validity. This calculation will be based on a 5% margin of error and a 95% confidence level. Utilizing a statistically valid sample size, established confidence and error margins, and performing five vital pretests supports the generalization of the study's findings.

Each of the identified meetings will be catalogued in Microsoft Excel and assigned a sequential meeting number. A random number generator will be used to select the meetings that will form the final sample. A data tracking spreadsheet will be created with the following columns:

Column 1: Meeting Number

Column 2: Complaints per 1,000 workers

Column 3: National Exams

Column 4: State Exams

Column 5: Post-Secondary Education

Column 6: Training/Experience

Column 7: Background Checks

For each of the sampled meetings, the corresponding licensing board's website will be used to access meeting minutes. Specifically, the "Initial Complaint Review" section will be examined to count the number of complaints reviewed at the identified meeting. This number will then be normalized by converting the number into complaints per 1,000 licensed workers using the data obtained through the public records requests. The standardized figure will be recorded in the data tracking chart in the second column.

The next step is to determine the licensing requirements for each licensing board. To determine the requirements, publicly posted application packets will be reviewed. Each packet will be analyzed for the independent variables of this analysis. More specifically, the licensing application packets will be analyzed to assess whether the board requires the passage of a national examination, the passage of a state-specific examination, the completion of post-secondary education, specific training or experience, and the passage of a background check. Each requirement will be coded as a binary variable: a value of "1" will be assigned if the requirement is present, and a "0" if it is not.

After all data have been collected and entered into the Excel spreadsheet, the dataset will be imported into SPSS. Prior to running the main analysis, the remaining four pretests will be conducted to confirm that the assumptions of multiple linear regression are met. If the assumptions are satisfied, a multiple linear regression analysis will be conducted to examine the relationship between licensing requirements and the frequency of consumer complaints.

Data Analysis

Prior to running the multiple linear regression, Knapp recommends "five pretest criteria need to be assessed to better ensure the robustness of the findings: (1) n quota, (2) linearity, (3) homoscedasticity, (4) multicollinearity, and (5) normality." (Knapp, 2018, p.314). The n quota and linearity tests can be conducted prior to running the multiple liner regression (Knapp, 2018).

The first pretest will be the n-quota test. This pretest ensures that the sample includes a sufficient number of observations relative to the number of predictor variables, thereby reducing the risk of overfitting and increasing the generalizability of the results. Conducting an n-quota pretest helps confirm that the sample is robust enough to support valid statistical inferences from the regression model.

The second pretest to be conducted will be the test for linearity as it can be performed prior to running the multiple linear regression. The linearity test checks if the relationship between each independent variable and the dependent variable is linear (Burton, 2021). This pretest will be performed in SPSS by observing scatterplots that pair each independent variable with the dependent variable. If the scatterplot produces a straight line, the pretest will show the relationship between the variables is linear (Knapp, 2018). A violation of linearity "would involve a scatterplot that shows an unexpected curve or nonlinear arrangement of the cloud of points that might be shaped like a U, a J, or an S" (Knapp, 2018, p.317).

The remaining pretests will be performed simultaneously with the multiple linear regression. The pretests will be observed and analyzed prior to analyzing the results of the multiple linear regression. The third pretest that will be performed is the test of homoscedasticity. This test assesses the distribution of residuals (Zientek, Nimon, & Hammack-Brown, 2016). The homoscedasticity pretest will be performed by analyzing the scatterplot that is produced in SPSS. If the data is homoscedastic, the scatterplot should not have any noticeable patterns, and the values should mostly fall between the +2 and -2 ranges of the axes.

The fourth pretest will be a test for multicollinearity. The multicollinearity pretest assesses if two independent continuous variables are highly corelated to each other (Burton, 2021). This is one of the most common problems faced in linear regressions (Mendenhall & Sincich, 2011). Multicollinearity occurs when two or more predictor variables in a regression model are highly linearly related and can

distort the estimation of predictability. The multicollinearity test will be performed simultaneously to the multiple linear regression but will be analyzed prior to the regression. When running the multiple linear regression, SPSS will produce a Coefficients table. The figures in the Variance Inflation Factor (VIF) column indicate multicollinearity (Mendenhall & Sincich, 2011). If the VIF value for the predictor variable is less than 5, there is no multicollinearity, and the next pretest will be performed. If the values are between 5 and 10, multicollinearity may be an issue. If the VIF value is greater than 10, there is strong multicollinearity, and the predictor variable will be removed from the analysis (Knepp, 2018).

The final pretest for this analysis will be the test for normality. Before conducting a multiple linear regression analysis, it is important to run a normality pretest to evaluate whether the residuals of the model are approximately normally distributed (Mendenhall & Sincich, 2011). The assumption of normality is helpful for the validity of the multiple linear regression (Burton, 2021). However, moderate departures from the assumption of normality have very little effect on Type I errors (Mendenhall & Sincich, 2011). The normality pretest will be performed by observing a histogram. The histogram will be produced in SPSS. If the histogram shows a symmetrical bell-shaped pattern with one peak, the residuals are normally distributed.

In sum, prior to analyzing the multiple linear regression, five pretests will be performed and assessed. These pretests include (1) N quota, (2) linearity, (3) homoscedasticity, (4) multicollinearity, and (5) normality. Scholars have noted "if any of the pretest checklist criteria are not satisfied, proceed with the analysis, but concisely discuss such anomalies in the Results or Limitations sections of the documentation so the reader can more plausibly interpret the precision of the findings" (Knapp, 2018, p.314). Once the pretests are performed and analyzed, the multiple linear regression will be conducted in SPSS.

A multiple linear regression analysis will be conducted to address the research question and evaluate the hypotheses guiding this study. Multiple linear regression is a statistical technique used to estimate the value of a continuous dependent variable based on the values of two or more independent variables (James et al., 2023). This method has been applied in prior scholarly investigations examining various dimensions of occupational licensure (Teague, 2022; Valentin, Najmabadi, & Honda, 2021). In this analysis, specific licensure requirements will serve as the predictor variables, while the number of complaints filed with Arizona licensing boards will function as the dependent variable. Unlike simple linear regression, which incorporates a single predictor, multiple linear regression allows for the simultaneous analysis of multiple predictors, thereby enabling a more nuanced understanding of their collective and individual effects on the outcome variable (James et al., 2023). This analytical approach allows for both prediction and interpretation. This provides insight into the extent to which each licensure requirement contributes to variations in complaint frequency. The formula for a multiple linear regression is: Complaints per 1,000 workers = β_0 + β_1(Training) + β_2(Education) + β_3(StateExam) + β_4(NationalExam) + β_5(BackgroundCheck) + ε

Once the pretests are performed, and the multiple linear regression is conducted through SPSS, the interpretation and analysis will begin. This analysis will set the alpha at 0.05. This alpha puts the significance level at 95%. Therefore, if the significance output is less than 0.05, the linear regression will be determined as significant (Cronk, 2020).

A multiple linear regression analysis will be conducted to address the research question of which occupational licensing requirements, as established by licensing boards, are operating under the public interest theory and advances the public good through the assurance of service quality among licensed professionals? The independent (predictor) variables will include the requirement to pass state and national examinations, completion of specified training, fulfillment of educational prerequisites, and successful passage of a background check. Since a multiple linear regression assumes variables are continuous (James et al., 2023), the nominal independent variables will be dummy coded. These variables will be used to predict the dependent variable which is the number of complaints received by licensing agencies. Prior to data analyzation, five pretests will be performed. This study will focus on the randomly selected occupational licensing boards meetings within the state of Arizona. Data for the analysis will be obtained through secondary data analysis, utilizing records and documentation originally produced by the licensing administrations. Prior research has established that public records requests are an effective method for gaining insight into governmental processes and practices (Greenberg, 2016).

Findings

Following the public interest theory, the licensing requirements were analyzed as mechanisms intended to preserve the public good. The dependent variable was the number of complaints received by Arizona licensing agencies per 1,000 licensed workers. Independent variables included successful completion of state or national examinations, fulfillment of mandated experience or training hours, attainment of a postsecondary degree, and the passage of a background check.

The findings include the results of the five multiple linear regression assumption pretests. These pre-tests were conducted prior to analyzing the multiple linear regression and answering the research question. This chapter also includes the descriptive statistics of the analysis as well as restates the central research question and the hypotheses. Finally, the inferential statistics and a discussion on the results of the multiple linear regression summarize the findings.

Multiple Linear Regression Assumptions Pre-Tests

N-Quota

The N Quota test ensures that the sample contains an adequate number of observations in relation to the number of predictor variables (Knapp, 2018). By ensuring the sample size is large enough, the results of the regression can be generalized. Implementing an n-quota pretest also verifies that the sample is sufficiently robust to support reliable statistical inferences from the regression analysis. Table 2 outlines the n quota test. To determine an adequate sample size Knapp (2018) recommends the following formula:

For each categorical value, N = (number of categories -1) x 10

Table 2

N Quota Test

Variable	**Type**	**Categories-1 x 10**
National Exam	Categorical (2)	10
State Exam	Categorical (2)	10
Post-Secondary Education Requirement	Categorical (2)	10
Experience/Training Requirement	Categorical (2)	10
Fingerprinting/Background Check Requirement	Categorical (2)	10
Total		**50**

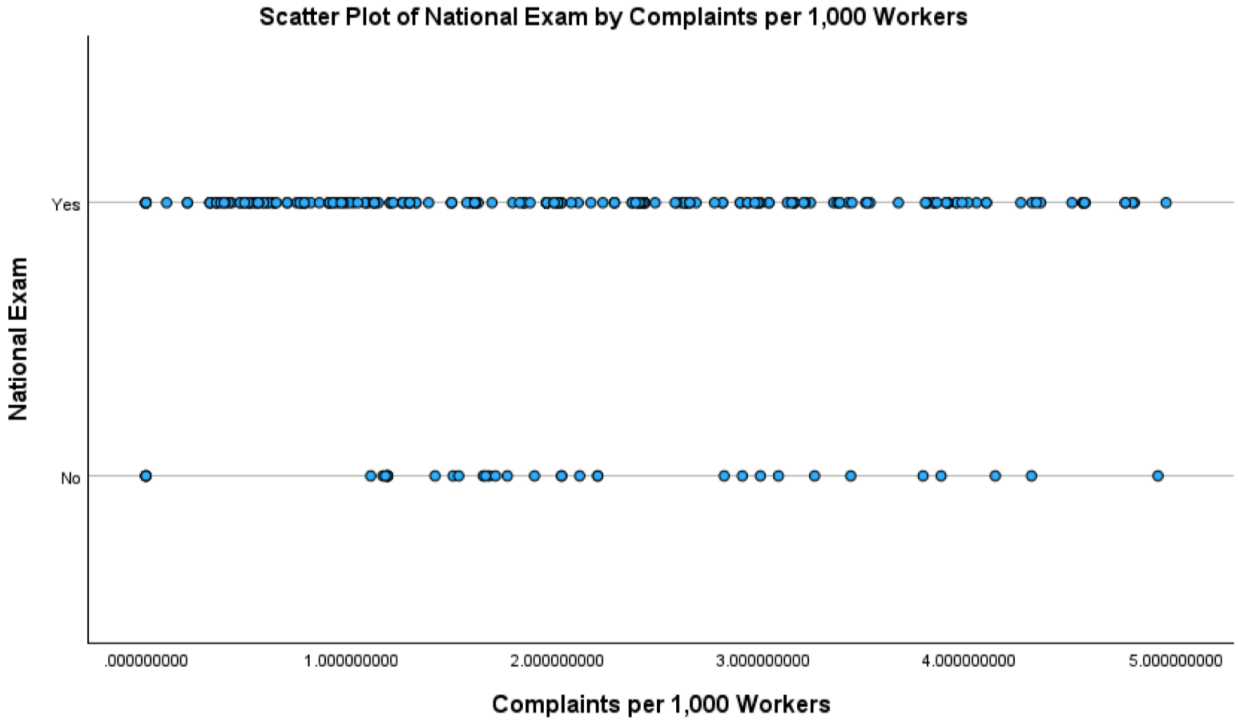
As seen in Table 2, the N quota test requires an N of at least 50. This analysis has an N of 275 which fulfilled this pretest.

Linearity

The linearity test determines if the relationship between each independent variable and the dependent variable is linear. A violation of the linearity assumption is indicated by a scatterplot displaying a nonlinear pattern or curvature in the distribution of data points, such as U-shaped, J-shaped, or S-shaped formations (Knapp, 2018).

Figure 5

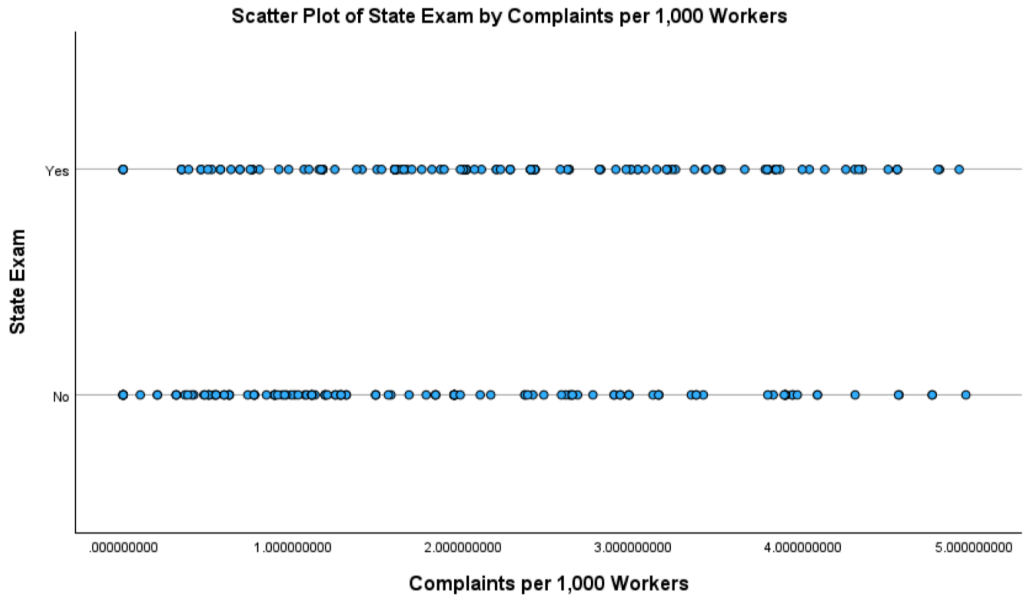
Linearity Assumption Test: Scatter Plot of National Exam by Complaints per 1,000 Workers



For the independent variable of national exams, the results of the scatter plot did not include any curved formations, and a linear relationship was shown.

Figure 6

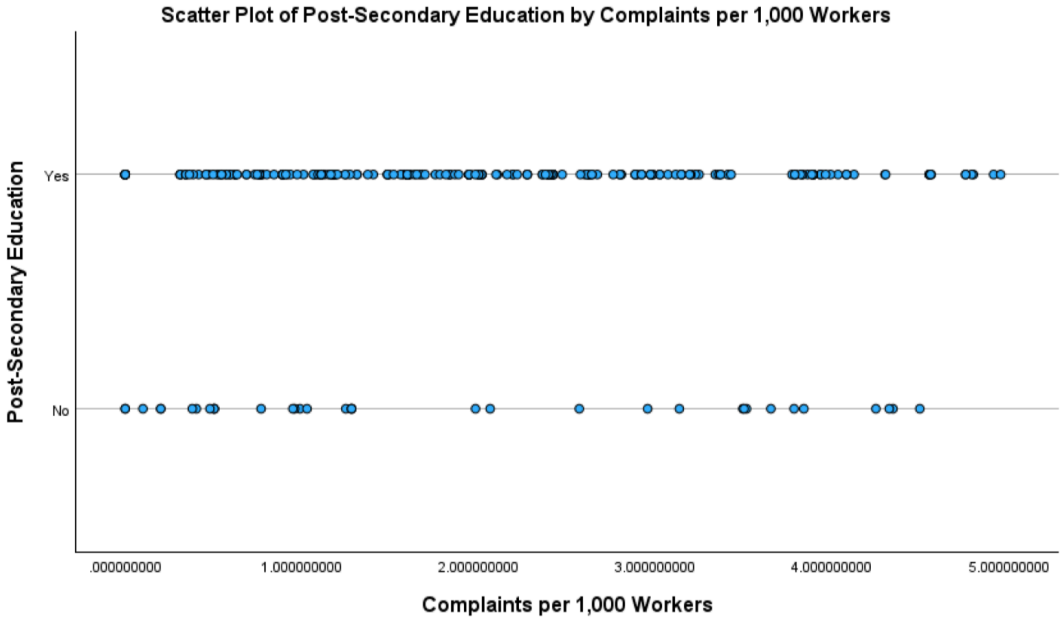
Linearity Assumption Test: Scatter Plot of State Exam by Complaints per 1,000 Workers



For the independent variable of state exams, the scatter plot did not include any nonlinear formations or U-shaped, J-shaped, or S-shaped formations. Therefore, a linear relationship was confirmed.

Figure 7

Linearity Assumption Test: Scatter Plot of Post-Secondary Education by Complaints per 1,000 Workers



For the independent variable of post-secondary education, the scatter plot did not include any curved formations, and a linear relationship was present.

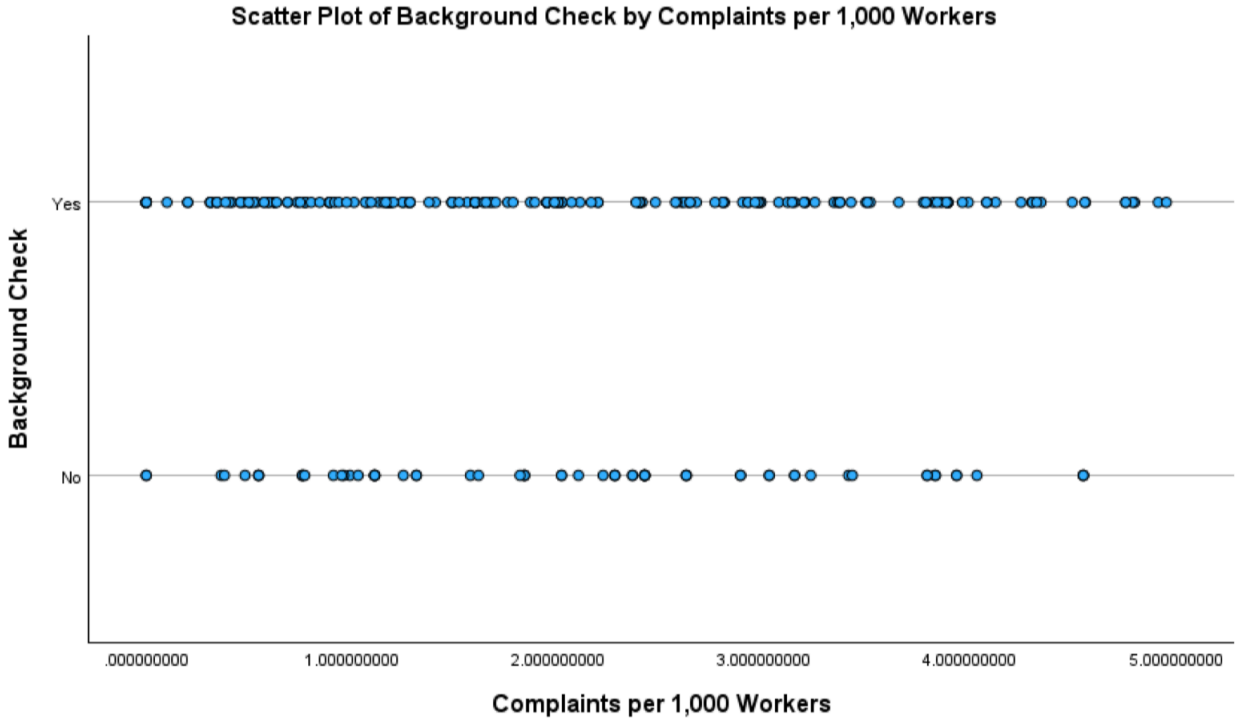
Figure 8

Linearity Assumption Test: Scatter Plot of Experience/Training by Complaints per 1,000 Workers

For the independent variable of training and experience requirements, the scatter plot did not include any U-shaped, J-shaped, or S-shaped formations. Therefore, a linear relationship was shown.

Figure 9

Linearity Assumption Test: Scatter Plot of Background Check by Complaints per 1,000 Workers



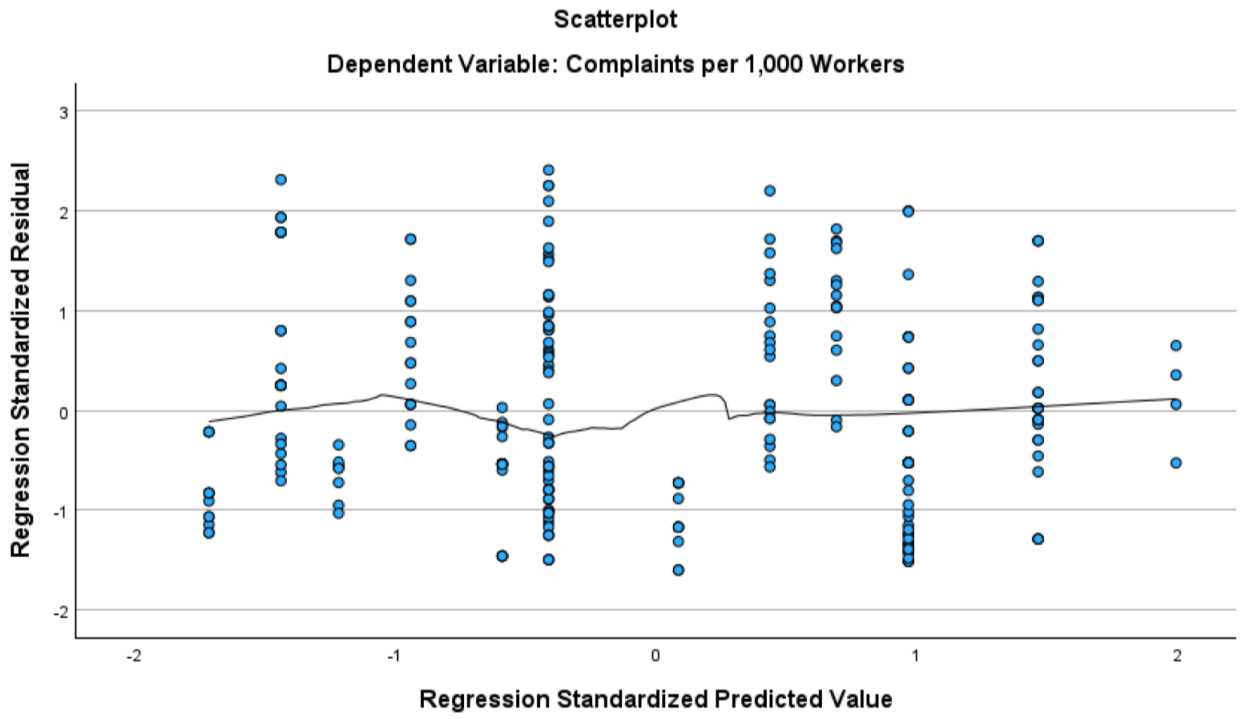
For the independent variable of national exams, the results of the scatter plot did not include any curved formations, and a linear relationship is shown. Therefore, all of the independent variables in this analysis possess a linear relationship with the dependent variable and the linearity assumption was confirmed.

Homoscedasticity

The homoscedasticity pretest in a multiple linear regression analysis evaluates whether the variance of residuals is consistent across the independent variable. A violation of homoscedasticity would occur when residuals fall outside the +2/-2 standard deviation (Knapp, 2018).

Figure 10

Homoscedasticity Assumption Test Scatterplot



As seen in Figure 10, the values within the scatterplot all fall within the +2/-2 range. Therefore, there was no violation of homoscedasticity.

Multicollinearity

The multicollinearity pretest assesses whether two or more independent variables in a regression model are highly correlated with each other, which can distort the estimation of individual predictor effects (Burton, 2021). High multicollinearity inflates standard errors and weakens the statistical significance of predictors (Mendenhall & Sincich, 2011). If the Variance Inflation Factor (VIF) for the independent variable is above five, there is a violation of multicollinearity (Knapp, 2018).

Table 3

Multicollinearity Assumption Test: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.003	.497		2.018	.045		
	National Exam	.411	.264	.109	1.555	.121	.718	1.393
	State Exam	.635	.193	.248	3.297	.001	.630	1.588
	Post-Secondary Education	.344	.261	.089	1.316	.189	.771	1.297
	Experience/Training	.271	.198	.106	1.371	.172	.599	1.670
	Background Check	-.131	.187	-.044	-.703	.483	.899	1.113

a. Dependent Variable: Complaints per 1,000 Workers

As seen in Table 3, all of the VIF figures for each of the five independent variables are under five. Therefore, there were no multicollinearity violations.

Normality

Normality pretests in multiple linear regression assess whether the residuals are normally distributed (Mendenhall & Sincich, 2011). This is important as the multiple linear regression assumes normality. Normality can be evaluated visually using a histogram and formally tested with the Shapiro-Wilk or Kolmogorov-Smirnov tests. For the histogram, if the output produces a symmetrical bell-shaped curve, it is considered normally distributed (Knapp, 2018). For the Shapiro-Wilk value, a value below 0.05 fails to reject the null hypothesis of non-normally distributed data. A value above 0.05 rejects the null hypothesis and found the data to be normally distributed.

Figure 11

Normality Pretest Histogram

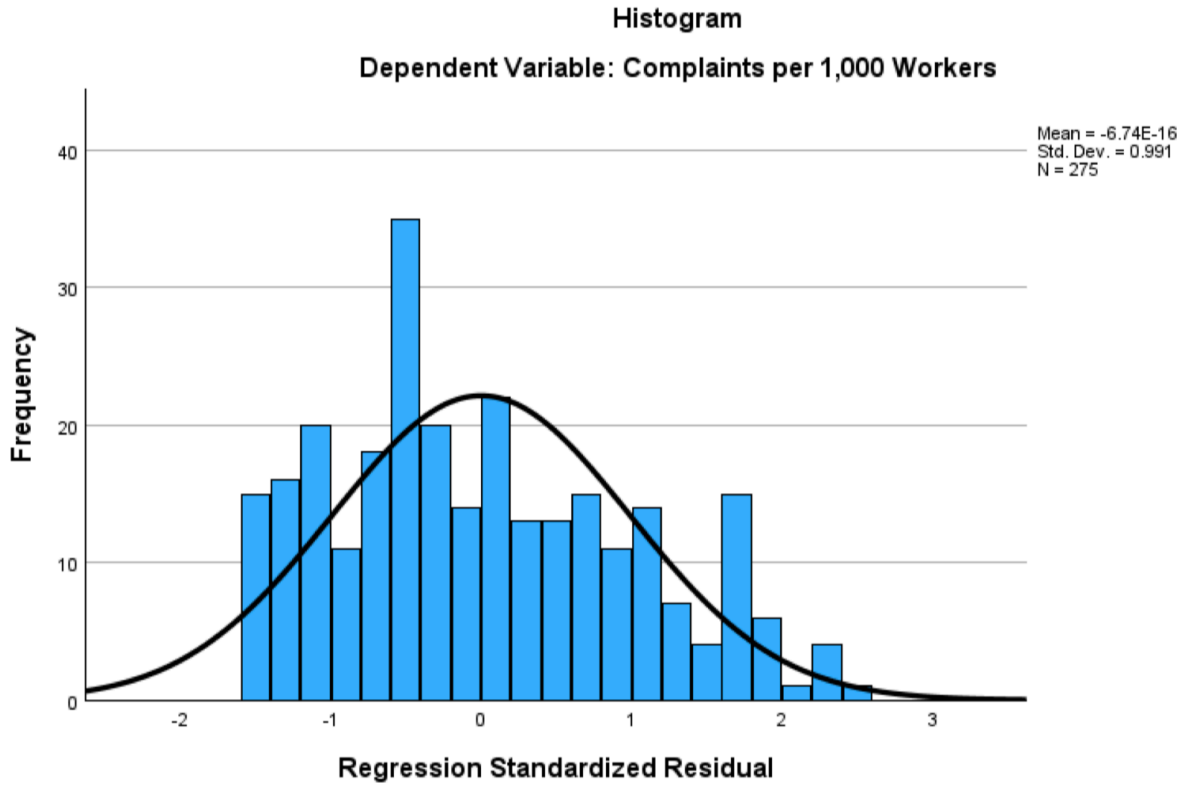


Table 4

Tests of Normality

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Complaints per 1,000 Workers	.085	275	<.001	.958	275	<.001

a. Lilliefors Significance Correction

Figure 11 shows the data is approximately normally distributed, with a roughly symmetric, bell-shaped curve. However, there are deviations from normality with a peak at -0.5 and skewness to the right. Conversely, results of the Shapiro–Wilk test indicated a deviation from normality, $W(275) = .958$, $p <$

.001. Therefore, the results of the normality tests show the data is not normally distributed and fails the normality assumption.

Assumption Tests Summary

Prior to running and analyzing the results of the multiple linear regression, five assumption tests were performed to ensure valid and generalizable results. Four of the assumption tests were satisfied. The N Quota test requires an N of greater than 50. This analysis has an N of 275. The five scatterplots testing the linear relationships between the five independent variables and the dependent variable showed no curve shaped distributions. Therefore, the linear assumption was satisfied for each of the predictor variables. Furthermore, the homoscedasticity test showed the data is homoscedastic as the residuals all fell within +2/-2 on the scatterplot. Furthermore, the Variance Inflation Factor results show the independent variables are not highly correlated and the multicollinearity assumption was confirmed. However, the normality assumption was not satisfied by the Shapiro-Wilk test with a result of $W(275) = .96$, $p < .001$. The histogram of the residuals showed departures in normality with a peak at -0.5 and skewness to the right.

Results

Descriptive Statistics

As seen in Table 5, the variable complaints per 1,000 workers was measured across all 275 cases, with no missing data.

Table 5

Case Processing Summary

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Complaints per 1,000 Workers	275	100.0%	0	0.0%	275	100.0%

The mean number of complaints was 2.01 (SE = 0.08), and the median was 1.84. The standard deviation was 1.28, with observed values ranging from 0 to 4.95 complaints per 1,000 workers. Skewness was 0.41 (SE = 0.15) and kurtosis was 0.80 (SE = 0.29), indicating a moderately right-skewed distribution with slightly heavier tails than a normal distribution. The results in Table 6 suggested that the data deviated somewhat from normality and would benefit from transformation for parametric analyses.

Table 6

Descriptives

			Statistic	Std. Error
Complaints per 1,000 Workers	Mean		2.00604243567	.077432790180
	95% Confidence Interval for Mean	Lower Bound	1.85360362772	
		Upper Bound	2.15848124362	
	5% Trimmed Mean		1.96931542158	
	Median		1.83582481000	
	Variance		1.649	
	Std. Deviation		1.284077557480	
	Minimum		.000000000	
	Maximum		4.952456418	
	Range		4.952456418	
	Interquartile Range		2.022934601	
	Skewness		.410	.147
	Kurtosis		-.802	.293

Data Transformation

Due to the failed Shapiro-Wilk test for normality in Table 4, an attempt to transform the data into a normal distribution was made using a base-10 logarithmic (LOG10) transformation in SPSS. While multiple linear regressions are robust against minor departures from normality, a data transformation can increase the normality of the residuals (West, 2022). Logarithmic transformations are a common corrective technique for positively skewed data because they compress the scale of larger values while preserving the rank order of observations (West, 2022). This adjustment reduces skewness and stabilizes variance, thereby bringing the distribution closer to normality and improving the validity of parametric statistical tests that assume normality of residuals.

Table 7

LOG10 Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
LOG10_Complaints	264	96.0%	11	4.0%	275	100.0%

To address non-normality and reduce the influence of higher complaint counts, a LOG10 transformation was applied. After the LOG10 transformation, 264 cases were valid, with 11 cases (4.0%) missing due to zero values in the original data (See Table 7).

Table 8

LOG10 Descriptives

			Statistic	Std. Error
LOG10_Complaints	Mean		.2222	.01978
	95% Confidence Interval for	Lower Bound	.1832	
	Mean	Upper Bound	.2611	
	5% Trimmed Mean		.2395	
	Median		.2890	
	Variance		.103	
	Std. Deviation		.32134	
	Minimum		-1.00	
	Maximum		.69	
	Range		1.69	
	Interquartile Range		.44	
	Skewness		-.764	.150
	Kurtosis		.197	.299

Table 8 shows the transformed variable had a mean of 0.22 (SE = 0.02) and a median of 0.289. The standard deviation decreased to 0.321, and values ranged from –1.0 to 0.69. Skewness shifted to –0.76 (SE = 0.15), and kurtosis was 0.197 (SE = 0.30), indicating that the distribution approached normality more closely. The LOG10 transformation compressed extreme values and reduced skewness. The transformation produced a distribution more suitable for parametric analyses. These adjustments enhanced the interpretability and robustness of subsequent statistical results.

While the LOG10 transformation reduced the deviation from normality, the transformed data continued to fail the normality assumption. Table 9 shows the normality assumption was not satisfied by the Shapiro-Wilk test following the LOG10 transformation with a result of W(264) = .947, p < .001. The histogram of the residuals in Figure 12 showed departures in normality with a peak at -0.25 and skewness to the left.

Table 9

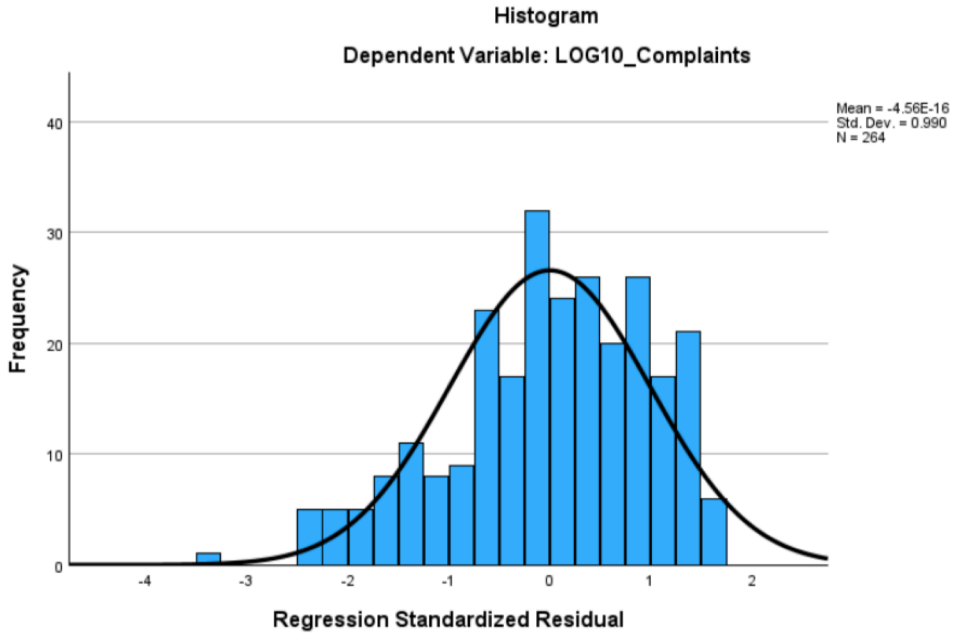
LOG10 Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
LOG10_Complaints	.094	264	<.001	.947	264	<.001

a. Lilliefors Significance Correction

Figure 12

LOG10 Normality Test Histogram



Central Limit Theorem

The central limit theorem is a principle in statistics that explains why parametric tests, including multiple linear regression, can withstand violations of normality under certain conditions. The central limit theorem states that as the sample size increases, the distribution of sample means approaches a normal distribution (Nanjundeswaraswamy & Divakar, 2021). More specifically, "In large samples, according to the central limit theorem, the data will approach normal distribution, therefore it can be assumed that the normal distribution assumption is achieved in large samples regardless of the normality determination methods" (Demir, 2021, p.400). This occurs even if the data itself is skewed. In practice, many scholars consider a sample size of 30 to be a reasonable threshold for the central limit theorem to take effect (Fukudu, 2024). More so, larger samples further reduce the impact of non-normality (Demir, 2022).

In this study, the dependent variable of complaints per 1,000 licensed workers was log-transformed to reduce skewness and attempt to achieve a normal distribution. Although the Shapiro–Wilk test continued to indicate a deviation from normality, the relatively large sample size (N = 275) falls under the central limit theorem. Therefore, the central limit theorem supports the reliability of regression estimates despite the failed normality test. Formal normality tests, such as the Shapiro–Wilk tests outlined above, are highly sensitive to even small deviations from normality in large samples and can produce statistically significant results even when those deviations are not practically meaningful (Demir, 2022). Therefore, given the changes made following the data transformation and the robustness of regression models in large samples, the multiple linear regression was conducted and analyzed.

Research Question & Hypotheses

RQ1: Is there a significant predictive relationship of service quality (*complaints*) from the occupational licensing requirements to pass a national examination (*ntlexam*), statewide examination (*stexam*), fulfilling training or experience requirements (*experience*), satisfying educational requirements (*educ*), and the passage of a background check (*bgcheck*)?

> **$H_0$1:** There is no statistically significant predictive relationship of service quality (*complaints*) from the occupational licensing requirements to pass a national exam (*ntlexam*), statewide exam (*stexam*), fulfilling training or experience requirements (*experience*), satisfying educational requirements (*educ*), and the passage of a background check (*bgcheck*)?

> **H_a1:** There is a statistically significant predictive relationship of service quality (*complaints*) from the occupational licensing requirements to pass a national exam (*ntlexam*), statewide exam (*stexam*), fulfilling training or experience requirements (*experience*), satisfying educational requirements (*educ*), and the passage of a background check (*bgcheck*)?

Inferential Statistics

To test the hypothesis that there is a statistically significant predictive relationship of service quality from the occupational licensing requirements to pass a national exam, statewide exam, fulfilling training or experience requirements, satisfying educational requirements, and the passage of a background check, a multiple linear regression analysis was conducted. The requirements to pass a national examination, a state examination, fulfilling training or experience requirements, obtaining a post-secondary degree, and passing a background check were entered into the regression equation as predictor

variables. The number of LOG10 transformed number of complaints received per 1,000 licensed workers was entered into the equation as the outcome variable.

Table 10

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.240[a]	.058	.039	.31493

a. Predictors: (Constant), Background Check, Post-Secondary Education, State Exam, National Exam, Experience/Training
b. Dependent Variable: LOG10_Complaints

Table 11

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.568	5	.314	3.162	.009[b]
	Residual	25.589	258	.099		
	Total	27.157	263			

a. Dependent Variable: LOG10_Complaints
b. Predictors: (Constant), Background Check, Post-Secondary Education, State Exam, National Exam, Experience/Training

Table 12

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.079	.129		.610	.542
	National Exam	-.012	.069	-.012	-.174	.862
	State Exam	.131	.048	.204	2.710	.007
	Post-Secondary Education	.133	.067	.137	1.971	.050
	Experience/Training	.030	.051	.046	.587	.558
	Background Check	-.056	.047	-.075	-1.178	.240

a. Dependent Variable: LOG10_Complaints

Research Question

A multiple linear regression analysis was conducted to answer this study's research question and determine the extent to which the licensing requirements of background checks, post-secondary education, state exams, national exams, and experience/training predicted the log-transformed number of complaints (LOG10_Complaints). A significant regression equation was found (F (5,258) = 3.162, p = .009), with an R 2 of .058. The predicted number of LOG10_Complaints is equal to .079 - .12(National Exam) + 1.31(State Exam) + 1.33(Post-Secondary Education) + .30(Experience/Training) - .56(Background Check), where National Exam, State Exam, Post-Secondary Exam, Experience/Training, and Background Checks are coded as 1=YES, 0=NO, and LOG10_Complaints is measured in the number of complaints per 1,000 licensed workers. Both State Exams and Post-Secondary Education were significant predictors. National Exams, Experience/Training, and Background checks were not significant predictors. However, with an R 2 of .058, the set of licensing requirements in this analysis only explained 5.8% of the variance in LOG10 adjusted complaints. The results of the regression analysis rejected the null hypothesis and support the conclusion that licensing requirements are statistically related to complaint rates.

State Exams

An examination of individual predictors revealed that requiring a state exam was significantly associated with an increase in complaints, β = .204, t(258) = 2.710, p = -.007. This indicates a small

positive effect size. Licensing boards that require state examinations found a statistically significant increase in the number of complaints per 1,000 workers than the licensing boards that do not have this requirement.

Post-Secondary Education

Similarly, the analysis of individual predictors found a marginally significant positive relationship between post-secondary education requirements and complaints, $\beta = .137$, $t(258) = 1.971$, $p = -.050$. The p value implies that the relationship between these variables is weak. Therefore, the post-secondary education requirement is weakly associated with an increase in the number of complaints per 1,000 workers.

National Exams

The requirement to pass a national examination for licensure was not significantly related to the log-transformed number of complaints per 1,000 workers, $\beta = -.012$, $t(258) = -.174$, $p = .862$. The near-zero Beta value and large p value shows the requirement to pass a national examination has a negligible and a statistically non-significant impact on the number of complaints per 1,000 licensed workers.

Training/Experience

Similarly, the condition to fulfill experience or training requirements prior to obtaining an occupational license was not statistically significant to the log-transformed number of complaints received by licensing boards per 1,000 workers, $\beta = .046$, $t(258) = .587$, $p = .558$. These results found a non-statistically significant weak positive association between these variables.

Background Checks

Finally, the requirement to either pass a pre-employment background check or submit fingerprints at the time of applying for an occupational license was found to not have a statistically significant relationship with the log-transformed number of complaints per 1,000 workers, $\beta = -.075$, $t(258) = -1.178$, $p = .240$. These findings imply a small negative but non-statistically significant relation.

Summary

It is not known if the public interest theory is actively guiding public administrators in their requirements for occupational licensing. The purpose of this study was to examine whether public administrators are effectively fulfilling their role in ensuring that workers are adequately prepared to enter their respective professions and deliver quality services through their occupational licensing requirements. A multiple linear regression was performed to examine if a combination of licensing application requirements by public licensing boards protects the public good by examining the service quality by licensed workers. This study's independent/predictor variables were the requirements to pass state exams, national exams, complete a set amount of experience/training, fulfill post-secondary educational requirements, and the submittal of fingerprints or the passage of a background check. The study's dependent/outcome variable was the number of complaints against licensed workers in Arizona per 1,000 workers.

Prior to running a multiple linear regression, five assumptions should be met to ensure valid and generalizable results (Knapp, 2018). These pretests are: "(1) n quota, (2) linearity, (3) homoscedasticity,

(4) multicollinearity, and (5) normality." (Knapp, 2018, p.314). Four of the assumptions were satisfied. The n quota test, tests for linearity, homoscedasticity, and multicollinearity all passed their respective assumption tests. The test for normality was not satisfied as the histogram of the residuals showed skewness to the right. Furthermore, the Shapiro-Wilks test found a deviation from normality, $W(275) = .958$, $p < .001$. Due to the failed normality assumption pretest, a base-10 logarithmic transformation was performed in an attempt to normalize the data. Logarithmic transformations are often used to reduce skewness and produce distributions closer to normal (West, 2022). Following the transformation, the ShapiroWilks test continued to fail. However, the distribution of the residuals from the LOG10 transformed data was closer to normal than the original data as the skewness was reduced from 1.284 (SE=.147) in the original data set to .321 (SE = 0.15), in the transformed data. Furthermore, the kurtosis shifted from -.802 (SE=.293) in the original data to .197 (SE=.299) in the LOG10 transformed data.

The overall regression model examining whether the five licensing requirements predicting the log-transformed number of complaints was significant ($F(5,258) = 3.162$, $p = .009$), with an R 2 of .058. This indicates that the set of predictors explained 5.8% of the variance in complaint rates. Among the predictors, state exams ($\beta = .204$, $t(258) = 2.710$, $p = -.007$) and post-secondary education ($\beta = .137$, $t(258) = 1.971$, $p = -.050$) were statistically significant, while national exams, experience/training, and background checks were not significant. These findings suggest that although licensing requirements are statistically related to the log-transformed complaints per 1,000 workers, the amount of variance explained by these factors is modest.

Conclusions

Overview

The purpose of this study was to address a gap in public administration research by investigating whether occupational licensing requirements, as determined by public administrators in Arizona, are effectively advancing the public interest through workforce preparedness and service quality. This study analyzed complaints against licensed workers as a measure for service quality. Specifically, the analysis evaluated whether the requirements of education, training, national examinations, state examinations, and background checks collectively contribute to service quality. By examining these requirements collectively through a multiple linear regression, it responds to the gap in previous literature which outlines a need for a collective assessment of licensing requirements and their alignment with public interest theory through service quality oversight.

The results of this study found the predictor variables explained only 5.8% of the variation in complaint rates. Meaning, licensing requirements had a very limited influence on the number by complaints received by occupational licensing boards. While this R^2 value is relatively low, it does not mean the model lacks practical and theoretical value. Rather, this value reflects the complexity and multifaceted nature of the relationship between occupational licensing and service quality. Previous research has highlighted the spatial mismatch between the regulatory intent set forth by public administrators and lawmakers with occupational licensing and the service quality from licensed practitioners (Edisis, 2025). The findings in this analysis suggest that factors outside of the initial licensing requirements put in place by lawmakers and public administrators have a much larger impact on service quality than those included in this analysis. These results are in line with previous research that highlights the complex relationship between occupational licensing and service quality (Chu,

Ananthakrishnan, & Smith, 2025). It is possible that variables such as workplace conditions, professionalism, and the nature of the work may play a more significant role than the initial licensing criteria. These results challenge the assumption that licensing requirements alone are sufficient to advance the public interest (Carollo, et al., 2025). Therefore, these results indicate that complementary policies may be needed to ensure higher levels of service quality.

Theoretical Contributions & Implications

The theoretical framework for this analysis stemmed from the public interest theory. The public interest theory contends that regulations are established to protect and advance the wellbeing of the public (Thomas & Thomas, 2022). From this perspective, regulatory interventions, such as occupational licensing, are designed and implemented to ensure that licensed workers meet minimum competency standards. By requiring applicants to meet these standards, the occupational licensing boards protect consumers and maintain service quality (Barrios, 2022). Building on the foundation of the public interest theory, public value theory broadens the scope of public administration by moving beyond just correcting market failures. More specifically, the public value theory emphasizes the role of government in creating tangible benefits for society (Moore & Bennington, 2010; Chohan, 2024). Moving further, scholars have also explored the role of the public officials themselves by noting motivations and values shape how public administrators carry out their responsibilities. Finally, the stewardship theory contends that public servants are intrinsically motivated to act as guardians of the public good (Keay, 2017). In the context of occupational licensing, this perspective implies that licensing board members operate as stewards who act in the public's best interest. As a whole, the public interest theoretical framework outlines the intent of occupational licensing and its requirements set forth by licensing boards. Here, the occupational licensing requirements are implemented with the intent to protect the public from harmful services.

The competing theoretical framework for this analysis was the social closure theory. The social closure theory, first developed by Max Weber (1922), explains how groups establish boundaries and create barriers to monopolize resources for their own benefit while excluding others. Through these mechanisms, the in-groups consolidate resources and limit access to opportunities for those in the out-groups. When scholars apply this theory to the labor market, this framework is often referred to as occupational closure. Occupational closure theory emphasizes that legal and social barriers, such as the occupational licensing requirements, can restrict the supply of labor and increase wages (Weeden, 2002). Once established, closed occupations tend to protect their status by discouraging competition and benefiting those in the in-group.

Moving further, public choice theory examines the behavior of individuals within the public sector. Rooted in the assumption that public officials act in their own self-interest, public choice theory highlights how such motivations can result in inefficiency and come at the expense of the public (Karadimas, 2022). Regulatory capture theory extends this framework by contending that agencies, which are established to serve the public interest, may instead become dominated by the industries they supposed to be regulating.

The results of this analysis contribute to both the public interest theoretical framework and the social closure theoretical framework by highlighting the difficulty of aligning administrative requirements with the protection of the public good. The public interest theory, public value theory, and stewardship theories explain the initial intent for creating and enforcing occupational requirements as these theories

assume that these requirements will enhance service quality and protect the public good (Larkin Jr., 2016; Carollo, et al., 2025). The results of this study found that licensing requirements explained only 5.8% of the variation in service quality complaints. This weak statistical relationship suggests that licensing requirements may not be delivering on their intended purpose and provides insights on the actual outcome of these licensing requirements. Rather than dismissing this value as insignificant, these results should be understood as a reflection of the complexity of service quality, which is influenced by numerous factors beyond the initial licensing process.

Instead, the outcome aligns more closely with social closure and occupational closure theories, as the requirements appear to function more as barriers to entry than as mechanisms that guarantee higher quality services. This theoretical framework contends occupational licensing requirements act as an unnecessary barrier to entry which solely benefits licensed workers and do not act as a value to the public. This study found requiring a state exam was significantly associated with an increase in complaints, $\beta = .204$, $t(258) = 2.710$, $p = -.007$. Similarly, the analysis found a marginally significant positive relationship between post-secondary education requirements and complaints, $\beta = .137$, $t(258) = 1.971$, $p = -.050$. The requirements to pass a national examination ($\beta = -.012$, $t(258) = -.174$, $p = .862$), fulfill experience or training requirements ($\beta = .046$, $t(258) = .587$, $p = .558$), and either pass a pre-employment background check or submit fingerprints at the time of applying for an occupational license ($\beta = -.075$, $t(258) = -1.178$, $p = .240$) were all found to not have a statistically significant relationship with the log-transformed number of complaints per 1,000 workers. These findings show that licensing requirements do not inherently increase service quality and benefit the public through quality services. Therefore, the results of this analysis challenge the assumption embedded in the public interest theoretical framework that licensing requirements inherently protect the public good (Carollo, et al., 2025). Instead, the limited explanatory power of licensing requirements points toward the possibility that these mechanisms serve to restrict labor supply without meaningfully improving service quality. From a theoretical perspective, this suggests that the intent of licensing requirements may be undermined by its outcome of restricting entry without increasing service quality. This raises questions about whether current licensing practices truly advance the public interest.

Implications

Practical Implications

The findings of this study suggest several practical implications for public administrators and licensing boards in Arizona. The statistically significant positive association found between state examinations and complaint rates indicated that requiring a state-specific test may not serve as an effective means for ensuring higher service quality. Instead, it may signal a misalignment between the content of these state specific exams and the practical skills required for adequate service quality. This could present an opportunity for administrators to review the design and content of their state exams to ensure they measure competencies that translate into service quality.

Several licensing boards require the passage of state jurisprudence exams prior to obtaining an occupational licensing. These state level exams are focused on state law rather than the knowledge and skills associated with practicing the profession (Tolleson, et al., 2024). The findings of this analysis showed these exams, and their subject matter, do not directly increase service quality and reduce the number of complaints. However, the results of this study suggest that this intent is not realized in practice,

and the outcome more closely reflects social closure theory where the requirement operates as a barrier to entry without enhancing service quality and contributing to the public good.

While the results of this analysis do not support the need for state exams as a measure to increase service quality, they do present an area of potential reform for licensing boards on a practical level. Here, the state boards design and develop these state exams (Adams, Frost, & Eid, 2023). This allows more oversight over the content of the exam and greater flexibility over their usage. Practically, licensing boards may shift away from these exams focusing specifically on state law and state statutes and focus more on tailoring the exam to focus on areas where reform is needed. This could align the intent of occupational licensing and the outcome of the requirements more closely with the public interest theory. Furthermore, the licensing boards may benefit from moving away from the state exam as a prerequisite for licensing and using it as an ongoing professional development tool. Even further, these results may even suggest that the exam requirements could possibly be removed entirely as public administrators could benefit from challenging the status quo of their requirements for licensure.

Similarly, the marginally significant relationship between post-secondary education requirements and increased complaints produces concerns about the practical value of higher educational attainment as a predictor of service quality. While educational attainment may develop academic knowledge, it may not necessarily strengthen practical skills or professional readiness of licensed workers. The results of this analysis may suggest that licensing boards could place greater emphasis on competency-based evaluations or continuing professional development or continuing education throughout a licensee's career, rather than assuming post-secondary educational achievements alone ensure quality service.

Post-secondary educational requirements are a common component of occupational licensing intended to ensure the licensee will have an adequate level of knowledge prior to entering the field (Hendricks, et al., 2021). This is especially true for occupations involving high paying licensed jobs (Floyd, Falconetti, & Camacho, 2022). However, the results of this multiple linear regression found a positive association between the requirement to obtain a post-secondary degree and the number of complaints per 1,000 licensed workers. These results highlight the differences between the intent of occupational licensing requirements under the public interest theory and the practical outcomes which align with the social closure theory. This implies the educational component of occupational licensing may benefit from reform. Practically, this may involve some licensing boards shifting from, or including, a continued education requirement associated with the occupational licensing.

For the requirements of national exams, training/experience, and background checks, the results showed no statistically significant relationship to complaint rates. These findings imply that these measures, while historically used as mechanisms to protect the public, may not be effective indicators of worker performance or service quality. Practically, licensing boards may need to reconsider the weight placed on these requirements. Furthermore, if licensing boards are facing a labor shortage, these requirements could possibly be removed in order to reduce the barrier to entry and promote labor growth in the industry without directly compromising service quality.

Policy Implications

From a policy perspective, the results of this study provide important insights into the broader topic of occupational licensing laws and requirements and their alignment with the public interest theory

and the social closure theory. This analysis found state exams and post-secondary education requirements were associated with higher complaint rates. These findings challenge the assumption that stricter licensing barriers promote public protection through adequate service levels from licensed workers. Public administration may benefit from reassessing whether licensing requirements are effective in their design to enhance workforce readiness.

The weak explanatory power of the regression model ($R^2 = .058$) further emphasizes the potential need for a reassessment of current licensing practices. Although modest, this R^2 value still indicates that licensing requirements have some predictive power, and their influence should be considered within the broader set of variables that affect service quality. From a theoretical perspective, this weak relationship undermines the assumption found in the public interest theory and the stewardship theory that these requirements inherently protect consumers (Carollo, et al., 2025). Instead, their limited explanatory power suggests they may function primarily as gatekeeping mechanisms consistent with closure theories. If licensing requirements collectively explain only a small proportion of the variation in service quality, public administrators may need to look beyond initial licensing requirements and consider complementary strategies, such as ongoing professional development or continued learning requirements. These measures may offer more direct pathways to ensuring quality service delivery than reliance on front-end licensing requirements alone. Furthermore, the continued education model allows licensees to learn and implement new trends and technologies within their profession which may have an impact on service quality (Forsetlund, et al., 2021). These measures can be introduced legislatively to ensure they are put into practice by public administrators in Arizona.

Taken together, these findings suggest that while occupational licensing requirements are intended to serve the public interest by ensuring competent and qualified professionals, their actual impact on service quality may be limited or even counterintuitive. The positive association between the requirements of state exams and post-secondary education and higher complaint rates shows a clear departure between intent and outcome. The intent of these licensing requirements is to protect the public. The outcome is consistent with the social closure theory and the occupational closure theory where barriers benefit license-holders more than the consumers.

At the same time, the lack of significance for national exams, training/experience, and background checks underscores the need for policymakers and administrators to reconsider which regulatory measures most effectively safeguard consumers. Looking through the lens of the public interest theory, these results imply that licensing practices must evolve from reliance on rigid occupational licensing entry requirements and possibly towards ongoing measures designed to ensure knowledge and skills throughout a licensed worker's career. Future policies and legislation should challenge the long-held belief that licensing requirements automatically serve the public good. More specifically, future policies and legislation should be grounded in producing practical outcomes that align with the public interest theory rather than solely having the intent align with the public interest theory.

Limitations

While the findings of this analysis are important and contribute to the field of occupational licensing and public administration research, this study did have its own set of limitations. One limitation was the geographic scope of the study. Because this analysis was limited only to the state of Arizona, the results should only be generalized within Arizona and should not be applied to other states. Arizona has

unique licensing practices and scope of practice laws. Therefore, the findings may not reflect licensing outcomes in different states.

Another limitation was related to the measurement of service quality. This analysis did not examine the severity of the complaints received, as each complaint was treated the same. As a result, a minor complaint such as wait times was considered the same as a more severe issue such as a surgical error. A further limitation lies in the modest R^2 value of .058, which indicates that a substantial portion of the variance in complaints remains unexplained. However, rather than dismissing the study's value, this highlights the complexity of service quality and signals the need for further exploration of additional explanatory variables. Future research may address these limitations by conducting similar studies across multiple states to increase generalizability and by weighting or categorizing complaints by severity to provide more depth. This study provides a foundation for scholars to build more comprehensive models that incorporate a wider range of influences on service quality.

Threats to Internal Validity

Threats to internal validity transpire when factors other than the variables being studied could explain the results of the analysis (Trafimow, 2023). The main threats to internal validity for this analysis stemmed from possible selection bias, history effects, and potential confounding variables. To limit the threat to internal validity through selection bias, the data from this analysis was randomly selected. Randomized sampling reduces selection bias and enhances the validity of statistical inferences (Noor, Tajik, & Golzar, 2022). The randomized sampling technique performed in this analysis allows the results of this analysis to be generalized to the rest of the licensing board meetings in Arizona. The methodology of this study enhances the potential generalizability of the findings to similar regulatory contexts where comparable sampling methods and data availability are present. These settings include states with similar licensing requirements and scope of practice laws.

To offset the impact of history effects on internal validity, the setting for this analysis was specifically chosen to avoid the direct impacts of the COVID-19 pandemic. In Arizona, the stay-at-home executive order was issued on March 31, 2020, and lifted on May 16, 2020, with the issuance of Executive Order 2020-36. The data collected for this study occurred from January 1, 2021, through December 31, 2024. This allowed for the most severe impacts of the COVID-19 pandemic to be avoided (Moyer, et al., 2022). While this study was designed to negate the impacts of COVID-19 as much as possible, effects such as staffing levels and supply chain issues may have contributed to complaint rates and the results of this analysis.

Finally, the threat to internal validity caused by confounding variables was limited through the research design for this study. One of the strengths of multiple linear regressions is the regression's ability to include multiple predictor variables. Rather than having to control for these confounding variables when running a simple linear regression, a multiple linear regression allows these variables to be included and accounted for by including them as additional independent variables. However, the results of this study found that only 5.8% of the variance is due to the licensing requirements. Therefore, other factors are influencing service quality beyond these requirements.

Threats to External Validity

Threats to external validity occur when research findings cannot be confidently generalized beyond the study sample (Trafimow, 2023). For this analysis, the primary threat to external validity was the geographic location of the data. The participants in this analysis were limited to the state of Arizona. Arizona ranks as the 5 th strongest state for occupational licensing in the United States (Knepper, et al., 2022). Furthermore, Arizona's scope of practices laws for licensed workers are broader than other areas of the country (Kleiner, 2015). This combination of a strong licensing environment and relatively broad scopes of practice creates a regulatory setting that differs from other states. As a result, findings that licensing requirements explained only a small share of the variance in complaints may not translate directly to states with weaker licensing frameworks or more restrictive scopes of practice. This regulatory environment limits the generalizability of the results beyond Arizona. However, the random sampling used in this study strengthens its potential relevance to other jurisdictions with similar licensing structures, as it reduces bias and enhances confidence in the representativeness of the findings. Future research may attempt to conduct a similar analysis and produce generalizable results to the entire United States. This can be done through selecting professions with similar scope of practice laws across multiple states. This would allow future research to determine if the weak explanatory power found in this analysis is unique to Arizona or if it is a broader issue across the United States.

Future Research

With the findings of this analysis showing that only 5.8% of the variance in the log-transformed number of complaints per 1,000 workers being associated with the five predictor variables of the requirements to pass a state exam, pass a national exam, obtain a post-secondary degree, fulfill training or experience requirements, and passing a pre-employment background check, there is a significant need for future research in this area. Future research is needed in four areas. First, future researchers can improve variable measurement and examine other variables that may impact service quality. In this study, the predictor variables were measured nominally by coding them as 1=YES and 0=NO. Subsequent research could examine these variables at the ordinal or ratio level, such as including actual exam scores, required passing grades, number of training or experience hours, or specific levels of education required. This can resolve the limitation of this study as this analysis did not further define these variables beyond a nominal measurement. By doing so, future research can gain further insights into the variables that produced a 5.8% variance in complaint rates.

More importantly, however, future research needs to examine other variables that may contribute to the remaining variance in complaint rates as this study failed to capture the remaining 94.2% in variance. These potential variables include staffing levels, workplace conditions, employee professionalism, and the nature of the work being performed. By examining these types of variables, future research can fill the gap in this analysis as this study was only able to account for 5.8% of the variance. Equally important, future research should attempt to capture additional predictors beyond licensing requirements. These predictor variables may include aspects such as staffing ratios, workplace conditions, or employee professionalism. These new variables may account for the remaining unexplained variance.

Second, future studies should analyze the content of complaints in greater detail. This study treated all complaints equally and did not account for severity or type. This provides a gap for future

research to explore. Future research could categorize complaints by type or severity, such as those directly related to service quality versus those stemming from consumer expectations or workplace conditions. This approach addresses the measurement limitation identified in this study and can provide a more nuanced understanding of how occupational licensing requirements relate to meaningful service quality complaints from consumers of the service.

Third, expanding the geographic scope of the research is important and necessary for future research. This study was limited to Arizona based on Arizona's strict licensing requirements and broad scope of practice laws. Future research could replicate this analysis in other states or perform multi-state comparisons. This would enhance external validity and clarify whether the weak relationship between licensing requirements and service quality observed in Arizona is consistent around the United States or influenced by the unique state regulations in Arizona. By pairing the results of this analysis with future research targeting other geographic areas, a more comprehensive understanding of occupational licensing requirements and service quality can be achieved.

Finally, future research should explore the possibility of continuing education requirements as a potential substitute for some of the existing licensing requirements examined in this analysis. Unlike one-time exams or degree requirements, continuing education allows licensed workers to stay current on emerging trends, best practices, and new technologies, which may more directly impact service quality (Forsetlund, et al., 2021). Future research on continuing education addresses the limitation of this study as this analysis only examined frontend licensing requirements. The results of future research on continued educational requirements and its impact on service quality may present a pathway for more effective legislation and policies. Future research should build on the gaps identified in this study. More specifically, should identify different predictor variables, better capture service quality, broaden generalizability, and explore alternative requirements that may more effectively advance the public interest. Taken together, future research should build on the gaps identified in this analysis by identifying additional predictor variables, using more precise measures of service quality, broadening the generalizability of findings to multiple states or settings, and examining alternative requirements such as continuing education that may more effectively advance the public interest.

Summary

Occupational licensing has dramatically increased in the United States with now 25% of the labor force subject to occupational licensing. This study examined whether the licensing requirements of state and national exams, education, training, and background checks, actually predicted service quality among licensed professionals in Arizona. Guided by the public interest theory, the study's hypothesis believed these licensing requirements would have a statistically significant predictive relationship. To test the hypothesis, a multiple linear regression analysis was used to see how different requirements related to the number of complaints filed against licensed workers.

This research used a non-experimental, correlational design with data from 275 licensing board meetings in Arizona between 2021 and 2024. The dependent variable was the number of complaints per 1,000 licensed workers, and the independent variables were the requirements of state exams, national exams, training/experience requirements, post-secondary education, and background checks. Five assumption checks for the multiple linear regression were completed, including linearity, homoscedasticity, multicollinearity, and normality. Although the data did not fully meet the normality

assumption, the central limit theorem supported moving forward with regression due to the large sample size (N = 275).

The results of this analysis showed that only state exams and post-secondary education were significant predictors of complaint rates. However, both of these predictor variables were linked to higher complaints. These findings challenged the long-held assumption, rooted in public interest theory, that licensing requirements safeguard consumers by improving service quality (Carollo, et al., 2025). National exams, training/experience, and background checks were not significant. Taken together, the model explained just 5.8% of the variance in complaint rates. This suggests that the licensing requirements examined in this analysis only play a very limited role in shaping service outcomes. Furthermore, this indicates that while licensing requirements are not irrelevant, their influence on service quality is small relative to the many other factors that shape consumer complaints. The modest explanatory power reinforces the complexity of service quality outlined in previous literature and signals the need for further research into other influencing variables.

These findings have important theoretical and practical implications. As it relates to the theoretical frameworks in this analysis, these results show that while the original intent of installing these occupational licensing requirements may have fallen under the public interest theory, the current practices fall more in line with the social closure theoretical framework as the requirements act as a burden to entry without a significant impact to service quality (Makridis & McLaughlin, 2025). These findings are important for policymakers and public administrators. The regression challenges the assumption that stricter licensing automatically leads to better service quality and highlights the need for rethinking how licensing requirements are designed and enforced. The results suggest that ongoing professional development and continuing education may be an alternative solution in need of further study. Rather than accepting the status quo of licensing requirements, public administrators should evaluate their licensing requirements and why they are put in practice.

This study added to the existing literature on occupational licensing by examining its effectiveness as a tool for ensuring service quality. Licensing remains an important responsibility of public agencies, but its role in advancing the public good requires ongoing review and reform. By using a statewide dataset of complaints, this study provides a replicable model that can be applied in other states and settings. Future research should look more closely at how licensing requirements are structured, the types of complaints filed, and alternative ways to protect the public that fall within the public interest theoretical framework.

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