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An Interrupted Times Series of the Personnel Security Section's Method to Address the Periodic Reinvestigation Case Backlog

Lathaniel F. Mills
Walden University

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Walden University

College of Social and Behavioral Sciences

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Lathaniel Freddie Mills

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Dr. Augusto Ferreros, Committee Chairperson, Public Policy and Administration Faculty

Dr. George Larkin, Committee Member, Public Policy and Administration Faculty

Dr. Richard DeParis, University Reviewer, Public Policy and Administration Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
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Abstract

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the Periodic Reinvestigation Case Backlog

by

Lathaniel Freddie Mills

MA, Columbia College, 2017

BA, Tuskegee University, 2011

Professional Administrative Study Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Public Administration

Walden University

August 2021

Abstract

The problem of periodic reinvestigation case backlogs faced by the personnel security section of the Transportation Security Administration was explored in this study. Specifically, a quantitative, quasi-experimental, interrupted time series methodology was employed to examine the effectiveness of the periodic reinvestigation team creation by the personnel security section to mitigate the case backlog. The administrative study was needed because the case backlog prevents the organization from following government guidance on periodic reinvestigation case processing. Organizational change theory was the conceptual framework that guided this study. Data gathered from the Integrated Security Management System helped answer the central research question regarding the impact the introduction of the periodic reinvestigation team had on the periodic reinvestigation case closures. The data encompassed one 12-month period of case completion before creating the periodic reinvestigation team and one 12-month period of case completion after creation. The multiple regression analysis for the introduction of periodic reinvestigation team variable produced a p value of .011, which resulted in the null hypothesis being rejected, and confirmed the periodic reinvestigation team's introduction was statistically significant. Additionally, the change slope variable produced a p value of .005, which again confirmed the introduction was significant. The findings of this study could inspire positive social change in the way government agencies fix backlog problems and save monetary waste in the federal government.

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Dedication

I dedicate this doctoral study to the memory of Louis Sam Highsmith. Gone but never forgotten. I also dedicate this doctoral study to the “Four,” which have shown me I can accomplish anything if I work hard and believe.

Acknowledgments

Thank you to Arielle, my family, friends, and colleagues, who pushed me to achieve my dreams and not quit. Thank you to the teachers I have had through my academia journey. I also thank those I have served with in the United States Army for making me a better soldier and man. I would also like to thank the military because without the GI Bill, I would not have been able to pursue this doctoral degree. To my PAS Committee, thank you for your guidance and encouragement. Again, thank you all.

Table of Contents

List of Tables	iv
List of Figures	v
Section 1: Introduction to the Problem	1
Problem Statement	1
Organizational Relevance	2
Significance.....	2
Purpose.....	3
Research Question	3
Nature of the Administrative Project	4
Significance.....	4
Summary.....	5
Section 2: Conceptual Approach and Background	7
Concepts, Models, and Theories	7
Organizational Change Theory	8
Clarification of Terms.....	12
Relevance to Public Organizations	13
Current State of Practice	15
Recommendations to Improve Practices.....	16
Previously Used Strategies and Standard Practices	17
Organization Background and Context.....	18
Organizational Context.....	19

Context Applicable to the Problem.....	19
Role of the DPA Student.....	20
Summary	20
Section 3: Data Collection and Analysis	22
Practice-Focused Question.....	22
Research Question	23
Alignment Between the Purpose and Research Question.....	23
Sources of Evidence.....	23
Data Source.....	23
Relationship of the Purpose to the Evidence	23
Collection and Analysis to Address the Question.....	24
Published Outcomes and Research	24
Archival and Operational Data	25
Analysis and Synthesis	26
Summary	26
Section 4: Evaluation and Recommendations.....	28
Employment of Multiple Regression Analysis and Internal Validity.....	28
IRTS Utility	28
Employment of Multiple Regression Analysis	31
Internal Validity	33
Findings and Implications.....	35
Assumptions Test.....	37

Multiple Linear Regression.....	43
Discussion.....	45
Recommendations.....	47
Strength and Limitations of the Project	48
Section 5: Dissemination Plan	50
Summary.....	50
References.....	52
Appendix A: Disclaimer	60

List of Tables

Table 1. Data Set Used for IRTS	36
Table 2. Model Summary	37
Table 3. ACF and PACF for the Time Series, Box-Ljung Statistic.....	38
Table 4. Correlations.....	42
Table 5. ANOVA	44
Table 6. Results of IRTS Analysis.....	45

List of Figures

Figure 1. Total Number of Cases Closed in Time Series	35
Figure 2. Normal P-P Plot of Regression Standardized Residual.....	39
Figure 3. Histogram	40
Figure 4. Scatter Plot Using ZRESID and ZPRED.....	41
Figure 5. Lowess Smoother Scatter Plot.....	43

Section 1: Introduction to the Problem

In this quantitative study, I explored the effectiveness of change within a government agency section, the Personnel Security Section (PERSEC) of the Transportation Security Administration (TSA), to combat the problem of work backlog. The PERSEC is responsible for ensuring the workforce's quality of working towards the agency's mission. Faced with a problem of backlog cases, the PERSEC has taken action to mitigate the problem and required a professional administrative study (PAS) to determine the organizational change effectiveness.

In this study, I highlighted the benefits of the organization's creation of the periodic reinvestigation team (PRT) to focus only on periodic reinvestigations (PRs) as an efficient mechanism to eliminate the case backlog. The elimination of the case backlog allows for the PERSEC to adhere to the government PR guidance (House Homeland Security Committee, 2017; U.S. Congress, 2004).

By analyzing the case log database used by the PERSEC, I have highlighted the impact the introduction of the PRT had on eliminating the case backlog. The PAS has also assisted in providing statistically significant data for other organizations to see the benefit of implementing systematic change in their organization to eliminate backlog problems and possibly change the way organizations process their PR cases going forward. The views expressed in this PAS are those of the author (see Appendix A).

Problem Statement

The central problem facing the PERSEC is the PR case backlog. PRs are conducted on all government employees that have a clearance. TSA is different and

requires they are done on all employees because of the sensitivity of the job duties (House Homeland Security Committee, 2017). Although the PERSEC unit understands the guidance outlines by Department of Homeland Security (DHS, 2016), the director of National Intelligence, and U.S. Congress (2004), the unit has accrued a backlog of PR cases (Security Executive Agent, 2017). The government-wide case backlog problem could be due to a rise in high-level cases because of an increase in government employee misconduct or the case backlog at the Office of Personnel Management (OPM), which provides oversight on PERSEC/TSA (Berger, 2019; House Homeland Security Committee, 2016).

Organizational Relevance

TSA believes the workforce's quality is essential to the organization achieving the mission of aviation security (House Homeland Security Committee, 2017). The PR backlogs are an increasingly significant issue in TSA because it hinders the organization's ability to properly adhere to personnel security policy (Government Accountability Office, 2017; House Homeland Security Committee, 2017; U.S. Congress, 2004). To address the case backlog issue and the seriousness of the problem, it was necessary to gather quantitative data from the PERSEC to determine the PRT effectiveness.

Significance

The National Counterintelligence and Security Center (2015) reported that some organizations' adjudication of cases was taking longer due to administrative matters, foreign influence, and financial considerations. This report shows that case backlog is a

government-wide problem. In this study, I have developed a blueprint for improving the methods used by organizations to address the backlog of their cases. The findings could also be used by similar organizations to show the need for innovation in dealing with productivity problems.

Purpose

The purpose of this study was to determine if the PRT's creation was a sufficient method to tackle the backlog of PR cases and if the team continues to be a proper tool to prevent a similar delay in the future. I collected data from the Integrated Security Management System (ISMS), which holds all the adjudicative case information for TSA, to determine if the PRT can process PR cases in a timely and efficient manner. Using the ISMS database was significant because it contained data that, when analyzed, outlined the existence of a statistically significant phenomenon among the case numbers and total case closures by the introduction of the PRT. The study has provided the PERSEC leadership with quantitative data with which to understand the impact of creating a PRT on catching up on the backlog of PR cases and preventing backlogs in the future.

Research Question

The central research question and hypotheses that guided the study were:

RQ: What was the impact of the PRT creation on the case closures in the PERSEC?

H_1 : There was a statistically significant impact on PR case closures in the PERSEC after the PRT creation.

H_0 : There was no statistically significant impact on case closures in the PERSEC after the PRT creation.

Nature of the Administrative Project

In this study, I used a quantitative, quasi experimental, interrupted time series (IRTS) design to examine data collected from the ISMS database and determine the effectiveness of a policy before and after the intervention. The use of the IRTS design was an accurate tool to explore the possible significance of introducing the PRT to the unit to combat the PR case backlog problem. The study aligns with the problem statement by providing PERSEC leadership with statistical data concerning the possible effects the PRT has on the problem and determining if the PRT creation resulted in the intended significant change. The seriousness of the problem and its impact on the organization to accomplish its mission will be detailed in the literature review.

Significance

As outlined previously, the problem was the PR backlog of cases in the PERSEC unit and the need to properly put a mechanism in place to address the backlog and prevent the same problem from occurring in the future. The findings of this study show that the case backlog problem was solved with the introduction of the PRT. Once the analysis was completed, the findings provided PERSEC leadership with statistically significant data on the change used to fix the problem. In this study, I also provided a service to the stakeholders by producing analysis that highlighted the steps taken by leadership to ensure that the issue was addressed and prevented in the future.

The study has supported the professional practice of PR and security clearance case closures by informing leadership and similar organizations of the success of the policy implementation of a PRT. The study is significant because the PERSEC leadership was presented with an analysis of the effectiveness of the policy change they made to mitigate the problem. The findings should influence their decision making when determining if additional actions are needed to eliminate the backlog and prevent it in the future.

The study is significant because the PRT's success could fundamentally change the way PERSEC units across the government tackle PRs. This study could inspire other organizations to conduct studies to determine the effectiveness of policy changes they have made to solve problems. A potential contribution to the field is that this study has shown the need for a review and possible change to organizational norms when problem solving. This study also has implications for positive social change by promoting the essential need for leadership to be proactive in their approach to solve problems.

Summary

In Section 1, I introduced the problem of the PR case backlog plaguing the PERSEC of TSA. I reinforced the seriousness of the problem with evidence from government literature. The section also included a description of the quantitative, quasi-experimental, IRTS design used to examine the possible effects of the introduction of the PRT. Lastly, I explained the significance of the study on the field of public organizations and for positive social change. In Section 2, I will outline current scholarly literature that

expresses the need for organizational change in solving organizations' problems. Section 2 will also include a discussion of the role that I, as the researcher, played in the project.

Section 2: Conceptual Approach and Background

Like many government agencies, the PERSEC of TSA faces PR case backlogs. Case backlogs prevent organizations from safeguarding the integrity of their workforce and adhering to the government policy of the PR process (House Homeland Security Committee, 2017). The PERSEC set out to address the problem of case backlog with the creation of the PRT, and I used this study to answer the following research question:

RQ: What was the impact of the PRT creation on the case closures in the PERSEC?

The purpose of the study was to determine the effectiveness of the PRT's introduction in addressing the case backlog and recommend other methods that will assist the PERSEC in accomplishing their mission. Later in this section, I discuss the organization's need for organizational change, relevance to public organizations, and my role as the researcher in this study.

Concepts, Models, and Theories

The concepts and theories that reinforced this study were based on the academic literature highlighting the need for organizational change to address problems that face modern organizations. While many groups in the private sector have utilized these concepts, little research has discussed the benefits such theories can have on public organizations. In the current study, I show that concepts and theories can be used to address the problems that some government agencies, like the PERSEC of TSA, face in pursuit of their missions.

Organizational Change Theory

I used organization change (OC) theory as the conceptual framework of this study. Celik and Ozsoy (2016) stated, “Organizational change can be defined as change in organizational structure, its systems, employees and relation between them in a planned or non-planned way” (p. 134). The OC concept used by the PERSEC leadership is essential in understanding the possible effects of adding a new section to the unit to combat the PR case backlog problem. The OC theory could also be used to explain why an organization’s productivity increases when they are willing to make changes. Providing PERSEC leadership with a theoretical understanding of the benefit of the change to an organization could give leadership the confidence to make other effective changes.

Lewin (1947) stated that a change occurs when influences impact a previous situation into a different, new situation. Armenakis and Bedeian (1999) explained OC is dependent on leadership influencing the workers to see the benefit of committing to a new way of performing a task. It could be concluded that members in an organization need influence to spark the change.

The concepts of OC have been discussed in academia for 30 years, with few success stories for the complete turnaround of an organization (Alase, 2017). While many focus on Lewin’s (1947) model of unfreezing, moving, and refreezing to explain OC, it was Armenakis and Bedeian (1999) building on the model with the stages of readiness, adoption, and institutionalization that pushed the thinking forward for OC (Bakari et al.,

2017). While slightly different, these models provide leaders with a blueprint for creating an environment where change can take place and be sustaining (Armenakis et al., 2007).

Communication between leadership and workers is essential for any organization to be successful. Alase (2017) suggested introducing change in the workplace is difficult on the change agent and the personnel impacted by the change and requires strong leadership to oversee the intervention. Armenakis et al. (2007) explained that at the root of their model is an effective change message that influences the change recipients to accept and adhere to the changes leadership has implemented. Communication during OC is dependent on clear messaging from leadership and the openness of the workforce to receive and accept the message.

The success of OC is reliant on the leadership within the organization. Talat et al. (2017) explained that because change projects have a high failure rate, responsibility for success is placed on the leadership. Celik and Nadir (2016) continued that thought, suggesting that leadership underestimating the role of the people involved in the change is a reason for the failure of OC. The leader seeking to make a change must focus on how the change will be implemented and the ramifications the change will have on the workforce while it is taking place (Celik & Nadir, 2016).

Ven den Van and Poole (1995) highlighted that in the quest to understand OC, theorists have used other disciplines outside of management. Alase (2017) provided some examples of theories used to explain OC:

- Life-cycle change theory described an organization as a living organism. Even though organizations need to go through changes, the organizations nevertheless keep and maintain themselves throughout the change process.
- Teleological change theory basically explains that an organization has a purpose and goals, and can be very adaptable. This theory also encourages cooperation among like-minded people when it comes to organizational change.
- Dialectical change theory encourages oppositions and conflicts between two or more distinct entities via mergers and/or take-over embattlements. Basically, dialectical theory is a theory that is complex and engaged in conflict.
- Evolutionary theory is all about change. In this theory, no organization stays static. Change is on-going (continuous) and the organization has to be adaptable to new changes (p. 29).

The theories presented show the complexity of OC and the need for those within the organization to be flexible and find the balance between smooth production and results for the stakeholders (Alase, 2017).

The concept of teams within an organization is essential to the implementation of OC and the production that follows (By et al., 2018; Cameron & Green, 2009). By et al. (2018) explained the benefit of a lean production team approach coupled with Theory E, which is focused on improvements and the stakeholder's motivation. Furthermore, the lean production approach focuses on simple jobs to improve production (By et al., 2018).

Simplifying the jobs expected of the team members seems to be a beneficial change to improve productivity.

It is essential for leadership within an organization seeking change to understand why change needs to occur. Petrou et al. (2016) discussed the concept of regular OC, which is implementing change to improve functionality and not a result of financial difficulties of the organization. It is essential to recognize that change not only impacts organizational functionality but also affects employees' work-related networks after the introduction of change (Lynch & Mors, 2018). Leadership should understand all consequences of OC before implementation.

Another crucial factor to consider is that the organization seeking change should not be rushed. Heckelman (2017) provided the following five principles to assist during change:

1. Change needs to occur at all levels of the company: organization, team, and individual.
2. Individuals need to see the connection between their individual beliefs and organizational results to better understand their role in making change efforts work.
3. Organizations must create a disciplined change execution plan and cascade to provide sufficient direction for leaders throughout the organization.
4. Organizations must fully equip leaders at all levels to drive change.
5. Effective communication and calibration are critical for change execution success (p. 20).

These principles show that change is not dependent on one level of an organization or one person but all levels and people of an organization.

There is no guarantee of the results after OC. Naveed (2018) and Panayiotou (2019) expressed that OC can present results and outcomes that are unexpected. Just as the results are unexpected, the factors that induce change are also varied. Krishnan (2018) explained that like outside forces, forces within the workplace can also significantly influence change. Leaders should consider all the factors inducing change to gauge the outcomes of change. Hansen (2018) highlighted that OC is tough and failure will take place, but an organization should not give up hope for some level of success.

Clarification of Terms

The terms used in this study are universal within the personnel security community in the United States. However, it is my responsibility as the PAS researcher to clarify some terms that may have multiple meanings outside the government. The following terms help outline the pillars of the background investigation process.

The Department of Defense (2016) defined *adjudication* as the process for determining if a person is qualified and eligible to be granted a clearance and/or eligible to hold a clearance. The person making the determination is known as the adjudicator and applies adjudication factors to the individual's background information (DHS, 2016).

U. S. Congress (2004) defined *agency* as a government body that is a part of the executive agency or military department as outline in the U.S. Code. In this study, agency was used to refer to an organization that has received a mandate by the government to

conduct investigations to determine the eligibility of a person to hold a clearance or retain their access (see Administration of William Clinton, 1995).

The term *background investigation* is used to describe all investigations conducted on employees, possible employees, or government contractors to determine their eligibility to access sensitive information (DHS, 2016). For this study, the term, background investigations, was used to represent an investigation done on a TSA employee.

The Security Executive Agent (2018) explained that *national security eligibility* (i.e., eligibility) is defined as someone eligible to hold, have access to, or be eligible to access sensitive information or a controlled area. For this study, eligibility refers to those who need access to classified information or hold a sensitive position.

A *PR* is an investigation to recertify a previous determination of a person's eligibility to classified information (U.S. Congress, 2004). Depending on the security clearance level, a PR is done every 5 years for top secret, 10 years for secret, and 15 years for confidential (U.S. Congress, 2004).

Sensitive position is defined as a position within the government or an organization working with the government that has access to or could have access to sensitive information (Security Executive Agent, 2018). For this study, I used a sensitive position to refer to all jobs within the TSA.

Relevance to Public Organizations

Government agencies and government-sponsored researchers have provided extensive literature on personnel security/background adjudication and, specifically, on

the PR process and the government-wide case backlog. PRs are conducted because an employee's eligibility to hold a clearance may change over time due to outside factors and should be reevaluated (Administration of William Clinton, 1995). PRs are as crucial as initial background investigations and should be conducted every 5 or 10 years, based on the level of clearance (National Counterintelligence and Security Center, 2015), or when there is reason to question if the employee meets the eligibility standards (Administration of William Clinton, 1995).

The policies and practices for the conduction of PRs and other clearance functions were explained by the U.S. Congress (2004) in the Intelligence Reform and Terrorism Act (IRTPA). The OPM was later given the responsibility of conducting the background investigations for government employees, and in 2016, the National Background Investigation Bureau (NBIB) of OPM was established (Committee on Oversight and Government Reform, 2017a). The Committee on Oversight and Government Reform (2017a) explained the NBIB provides investigative services to many government agencies, which are 95% of the federal investigations. The TSA and DHS are agencies that receive background investigation services from the NBIB (Office of Inspector General, 2012).

The problem of case backlog arose in 2014 with the loss of the OPM's largest field contractor reducing their ability to conduct investigations and resulting in an investigative backlog (Committee on Oversight and Government Reform, 2017a). The data breach in 2015 also added to the case backlog. The Government Accountability Office (2018) explained the NBIB records show that from 2014 to 2018, the backlog of

investigation surged from 190,000 to 710,000. The case backlog impacts federal agencies' ability to hire professionals to perform the needed homeland duties to protect the United States (Berger, 2019).

The IRTPA provided agencies with the timeframe for conducting and adjudicating background investigations (U.S. Congress, 2004). The case backlog prevents agencies from adhering to law because they cannot meet the processing deadline (Berger, 2019; Government Accountability Office, 2018). The IRTPA allows 60 days to complete an investigation for a clearance/clearance eligibility, 40 days for background investigation, and 20 days for an adjudication determination (Government Accountability Office, 2018). The case backlog has forced agencies to exceed the IRTPA timeframe, with some cases taking 220 days to complete (Berger, 2019; Government Accountability Office, 2018).

Current State of Practice

The current state of practice is Congress, and the Executive branch of the government lacks confidence in the current method of conducting background investigation (U.S. Congress, 2017). The Administration of Donald Trump (2019) signed the order to transition responsibilities for background investigations from OPM to the Defense Counterintelligence and Security Agency (DCSA) of the Department of Defense by October 1, 2020. The National Defense Authorization Act for Fiscal Year 2018 provided the process for the transition of these responsibilities (Government Accountability Office, 2017; U.S. Congress, 2017). According to the Committee on Oversight and Government Reform (2017b), the transition of responsibility would add to

the case backlog because the transfer would take 3 years, and NBIB, with limited resources, would have to conduct background investigations still and help Department of Defense set up their operation.

Recommendations to Improve Practices

Government agencies and government-sponsored researchers have also provided recommendations to improve PRs and background investigations practices. The recommendations to improve the process highlighted the benefit of OC for fixing processing issues (Berger, 2019). Some of the recommendations intend to combat the case backlog, and some intend to cut government spending.

The Office of Management and Budget (2014) suggested the decrease in time between reinvestigation. As stated previously, PRs are conducted every 5 years for top secret and 10 years for secret clearances (National Counterintelligence and Security Center, 2015). The current time between reinvestigations is not the best method to discover disqualifying information between investigation, and lack of resources influences agencies to conduct less than required reinvestigations (Office of Management and Budget, 2014). The recommendation tries to ensure the investigation is efficient in gathering the needed information about the employee.

Schneider et al. (2019) highlighted that investigators and adjudicators need access to security-trained mental health clinicians. Investigations are prolonged when waiting for private mental health providers for employees to give recommendations on the employee's mental conditions and trustworthiness (Schneider et al., 2019). The authors recommend that DOD create and train a cadre of security-trained mental health clinicians

to streamline the determination of trustworthiness for employees under investigation. Another benefit of these clinicians is that they would be unbiased towards the employee, which mitigates an investigators' concern that private providers may provide bias information concerning an employee (Schneider et al., 2019).

Another recommendation provided by the Office of Management and Budget (2014) suggested using a risk-based approach to reduce PR backlog government-wide. The Office of Management and Budget (2014) explained agencies can improve on discovering the high-risk individuals by prioritizing PRs by risk and sorting the cases by positions. The risk-based recommendation could save time and resources by flagging cases that require additional attention (Office of Management and Budget, 2014).

During the process of a background investigation, agencies employ the "whole person concept, which means reviewing all information about an individual to make a determination regardless of the time it happened and if it is negative or positive information" (Committee on Oversight and Government Reform, 2016). Based on the previous concept, using social media as a factor during the background investigation process is being implemented (Committee on Oversight and Government Reform, 2016). The use of social media has become an essential part of most Americans' daily routines and hosts vital information about employees that acts as a source of data for continued eligibility determinations (Committee on Oversight and Government Reform, 2016).

Previously Used Strategies and Standard Practices

The problem of case backlog has prompted NBIB and other government entities to introduce strategies to fix the problem. The Committee on Armed Services (2018)

highlighted that NBIB has increase information sharing between local and federal law enforcement organizations when completing background investigations. The Committee on Oversight and Government Reform (2017a) described other strategies to reduce case backlog, such as changing the writing style of the investigators to reduce the time to complete the report and redirect the time to other essential functions. Another standard practice being used is video teleconferences to conduct interviews and reduce the need for traveling and in-person scheduling conflicts (Committee on Oversight and Government Reform, 2017a). The strategies and standard practices previously discussed are implemented to reduce time and work more efficiently (Committee on Armed Services, 2018; Committee on Oversight and Government Reform, 2017a).

The Security Executive Agent (2018) detailed the implementation of the continuous evaluation (CE) process to recertify current government employees' clearance eligibility. The U.S. Congress (2017) suggested that through CE, the access to automated digital sources and records has shown a higher rate to produce severe issues than the standard procedure. The CE process is meant to gather relevant information that may otherwise be missed during a 5 or 10 year PR cycle between investigation (Committee on Oversight and Government Reform, 2017b). The CE process is still being rolled out for official use and should replace PRs once all responsibilities are turned over to DOD (Committee on Oversight and Government Reform, 2017b).

Organization Background and Context

The problem of case backlogs by NBIB has impacted their partner agencies' ability to adhere to oversight guidance for PR case completion (Berger, 2019; Committee

on Oversight and Government Reform, 2016; Committee on Oversight and Government Reform, 2017a; U.S. Congress, 2004). The elements of OC were used by PERSEC leadership to improve the functionality of the PR case adjudication process (Khan et al., 2018; Petrou et al., 2016; Talat et al., 2017). This doctoral study was needed to determine if the OC of adding the PRT was an effective method to address the PR case backlog problem in PERSEC.

Organizational Context

PERSEC is a security section within TSA/DHS responsible for adjudication functions for the TSA workforce across the world (Department of Homeland Security, 2016; Office of Human Capital, 2017). PRT is a small unit within PERSEC responsible for PRs and security clearances. The team duties are conducted in an office setting and under one supervisor's direction in the Washington D.C. Metro area at TSA headquarters. The team is in the infancy phase, and a study of productivity would help determine if the team is accomplishing the mission of PERSEC/TSA.

Context Applicable to the Problem

Government agencies have used personnel security programs since 1953 (Office of Inspector General, 2009). Along with Executive Orders, the DHS has also put in policies to ensure the personnel security programs run efficiently in their sub-organizations (Office of Inspector General, 2009). The ISMS database is used by DHS components to input, track, and complete all background investigations (Office of Inspector General, 2009) and has provided the information needed to conduct analysis on the effectiveness of the PRT introduction to complete and mitigate the PR case backlog.

As stated previously, OPM provides oversight functions to the PERSEC unit at TSA (Office of Inspector General, 2012), and a consequence of this oversight is the PR case backlog (Berger, 2019). Segregation of duties was suggested by the Office of Inspector General (2012) as an internal control for effective oversight. The segregation of duties, having members of the PERSEC form a new team to focus on PRs, is an OC that this administrative study has reviewed for effectiveness.

Role of the DPA Student

This IRTS study has detailed the effectiveness of the PRT's introduction to reduce and mitigate the PR case backlog in PERSEC of TSA. I performed the duties of a consultant for PERSEC and performed the research and analysis duties. I have worked for TSA for 5 years, my current position being within the PERSEC unit. The potential biases I possess is I am a member of the PRT. However, the study's data was from a time when I was not a member of the team. Another protection is my job is not subject to the outcome of this study, and the raw data has come from the ISMS database and not influenced by perceived biases I may possess. I was motivated to conduct this study because I wanted to provide PERSEC leadership with information that helps the organization achieve the mission.

Summary

In Section 2, I outlined OC as the conceptual framework for why change is essential for organizations to be successful. I also provided background information, supported by government-sponsored documents, to highlight the widespread bureaucracy problem and how it has caused the specific problem for PERSEC. I also showed the need

for the administrative study and the role I played in the study. In Section 3, I will present the methodology and analysis of the information collected.

Section 3: Data Collection and Analysis

The problem facing the PERSEC is the inability to adhere to government policy due to the backlog of PR cases. PERSEC leadership has taken the step to introduce the PRT as an organizational change to mitigate the PR case backlog problem. In the previous sections, I highlighted how the case backlog problem impacts the PERSEC of TSA and other government agencies. The purpose of this quantitative, quasi-experimental, IRTS study was to determine if the PRT's creation was a sufficient method to address the PR case backlog.

In a dual role as the researcher and consultant for the organization, I gathered PR case information from the ISMS database concerning the PRT's introduction to address the case backlog problem. The ISMS database contained the PR case information necessary to answer the research question. In this section, I discuss how the purpose aligns with the research question, the sources of evidence, the archival and operational data, and how the data were analyzed. The analysis of the data was vital to the organization's ability to comprehend the success of the change to fix the problem.

Practice-Focused Question

The problem plaguing the PERSEC is the PR case backlog that hinders the organization's ability to reevaluate employees' eligibility to access classified information effectively. The gap-in-organizational knowledge is the effectiveness of the introduction of the PRT to combat the case backlog problem. There is a lack of literature on the introduction of a subgroup within a personnel security organization to address functionality and productivity.

Research Question

What was the impact of the PRT creation on the case closures in the PERSEC?

Alignment Between the Purpose and Research Question

The purpose of the study was to determine if the PRT's introduction resulted in a statistically significant change to the PR case closures. The purpose of the study and the method of collecting data from the ISMS database provided the critical tools to answer the research question. I developed the research question to investigate PRT introduction's effectiveness and inform the PERSEC leadership of a possible statistical phenomenon.

Sources of Evidence**Data Source**

I used a quantitative, quasi-experimental, IRTS design to explore the PRT introduction's significance on the PR case backlog. I gathered the PR case closures for each month for a 12-month span, leading up to the introduction of the PRT, and then I gathered the PR case closures for each month, for a 12-month span after the PRT introduction. Each month contained the number of PR cases closed by the PERSEC before and after the PRT creation. The 24-month sample size is adequate to understand the impact of the PRT introduction.

Relationship of the Purpose to the Evidence

The purpose of the study was to determine the effectiveness of the PRT's introduction on the PR case backlog in TSA. The evidence collected from the ISMS database provided statistical, quantitative data with which to determine the impact of the PRT on the PR case backlog.

Collection and Analysis to Address the Question

Once I received Walden University Institutional Review Board (IRB) approval, I requested the data from the ISMS database for the months involved in the time series analysis. I then created variables in the IBM statistical package for the social sciences (SPSS) program from the ISMS raw data. Once the variable creation was completed, an analysis was conducted to show a possible contrast between PR case closures before and after the PRT introduction. After the analysis was completed, I documented the possible statistical significance to answer the research question. The data were recorded without bias or researcher influence. My analysis ended with the discussion of implications and recommendations.

Published Outcomes and Research

I used databases accessible through the Walden University Library to conduct searches for literature related to personnel security and case backlogs. I also searched these databases and Google Scholar to gather literature on concepts and theories. The key search terms used during the search were *adjudication*, *government policy*, *organizational change*, *periodic reinvestigation backlog*, and *personnel security*. The types of literature gathered included books, peer-reviewed articles, and government documents. The focus of the search was on literature published between 2014 and 2020 on the topics of the conceptual framework, organizational knowledge, and causes of the backlog problem.

Archival and Operational Data

The data held by the study organization are raw quantitative data that can be generated in ISMS to show the status of PR cases. The ISMS database can generate simple reports showing how many cases were closed during a specific timeframe and the number of cases closed by a PRT member. The contributors to the archival operational data are the NBIB and the members of the PRT in the PERSEC. The NBIB sends over the cases to be adjudicated once the investigative portion of the case is completed. A PRT supervisor then uses ISMS to assign the case to a PRT member. Once the PRT member makes an adjudicative decision, the case is closed, archived in ISMS, and the decision is sent back to the NBIB to be stored in their database.

The archival data are relevant to the PR case backlog problem because the ISMS database contains the cases that still need to be completed and the cases that the PRT has already completed. I utilized the data available in ISMS to determine the significance of the introduction of the PRT on the PR case backlog during the time series. The archival data also provided the information necessary to answer the research question and inform the PERSEC of the effectiveness of the organizational change implemented.

I gained permission from the PERSEC section chief to gather the necessary archived data once I received Walden University IRB approval to conduct the study. To receive permission, I had to explain the purpose of the study and how the data would be used. The section chief then got approval from the TSA legal department and the Sensitive Security Information (SSI) department to grant my use of the data for this doctoral study.

Analysis and Synthesis

The goal of the analysis was to determine if the research question was answered. I accomplish the goal by reviewing and synthesizing the data using the IBM SPSS Statistics, Version 27 software. The SPSS system also served as a location to track, organize, and record the data from the collection. The first step in the analysis was to ensure the data received from ISMS covered the time series being investigated. Second, I uploaded the data into the SPSS software and organized them into variables. Third, correlations were conducted on PR case production before and after the introduction of the PRT. Lastly, I reviewed the data to determine relationships between the variables and possible statistical significance.

The analysis was focused on answering the research question and ensuring the data's integrity and reliability throughout the process of analysis. I employed a multiple linear regression to determine the PRT introduction's significance on the PR case closures. Regression was an adequate analysis with which to make this determination because the ability to compare preintervention and postintervention during the time series. Once the regression analyses were completed, the results indicated that the null hypothesis should be rejected. The null hypothesis was that there was no statistically significant impact on case closures in the PERSEC after the PRT creation.

Summary

I selected the quantitative, quasi-experimental, IRTS research design because it was most suitable to answer the research question and inform the PERSEC of the PRT's impact on the case backlog problem. Now that the analysis is done and the study is

completed, I will submit this PAS to the PERSEC leadership so they can review the findings and ensure sensitive information was not disclosed in the study.

In Section 3, I outlined the methodology of this study and the plan for data collection and analysis. The methods used to protect the integrity of the data and prevent the disclosure of sensitive information were also provided. In Section 4, I will present the findings from the data collection as well as provide recommendations to the organization and the limitations of the study.

Section 4: Evaluation and Recommendations

The PERSEC of TSA has a PR case backlog problem that hinders its ability to adhere to government guidance. The gap in organizational knowledge was the statistical significance of the PRT's introduction as a means to solve the backlog problem. Therefore, the purpose of this study was to determine if the PRT's introduction was an effective method to address the PR case backlog problem.

Once I received Walden University IRB approval (IRB Approval Number 12-09-20-0745715), I notified the PERSEC leadership and received the ISMS data for PR cases closed during the time series from them. The ISMS data were used to create variables and run analyses in IBM SPSS software. The investigation was geared towards answering the research question and plotting the PR case closures before and after introducing the PRT. I also used the data to make recommendations on methods to mitigate the backlog problem that would be presented to PERSEC leadership.

Employment of Multiple Regression Analysis and Internal Validity

IRTS Utility

In this study, I employed the IRTS design to examine the consequences of the introduction of the PRT on the PR cases closed by the PERSEC. Bernal et al. (2018) explained the design examines the trends of *preintervention* and *postintervention* to determine the impact of the introduction of the PRT. In this administrative study, I examined the 12 months (i.e., preintervention) of PR case closures against the 12 months (i.e., postintervention) of PR case closures to determine the impact that the creation of PRT had on the PERSEC's PR case closures. IRTS was beneficial to this study and many

other studies because it allows a researcher to review the effectiveness of an intervention introduced to a specified group during a specific time series (see Bernal et al., 2017).

An IRTS is conducted when “a time series of a particular outcome of interest is used to establish an underlying trend, which is ‘interrupted’ by an intervention at a known point in time” (Bernal et al., 2017, p. 349). In the case of this administrative study, the particular outcome of interest was PR case closures. The underlying trend was a decrease in PERSEC closures of PR cases in the case backlog, and lastly, the interruption by an intervention at a known point of time was the introduction of the PRT into PERSEC in October of 2018. This study also qualified for the use of an IRTS because the observations, in this case, the total PR case closures, were recorded in equal intervals during the time series (see Baicker & Svoronos, 2019; Bernal et al., 2017). The interval for each observation for this study was 1 month.

Employment of an IRTS was important because the goal of the study was to understand the impact of the intervention of the PRT on the PR case closures. Kontopantelis et al. (2015) and Turner et al. (2019) found that IRTSs are the strongest of the quasi-experimental designs that seek to understand the effectiveness of an intervention. While historically IRTSs have been used to forecast possible outcomes in business and economics, they are also effective in elevating new techniques and or policy changes in an organization (Matowe et al., 2003). Using the IRTS design is the efficient method of understanding the influence of the introduction on PR case closures (Matowe et al., 2003; Wagner et al., 2002).

Another reason this study aligned with the principles of IRTS was that the design is efficiently used when applied to a natural environment where an intervention has occurred (see Kontopantelis et al., 2015). In the current study, I examined actual data from the policy change of the PRT introduction and studied the natural trends of the preintervention of PR case closures and the postintervention PR case closures. This study also adhered to other principles of an IRTS by the intervention trend being linear and that the intervention was at one, identifiable time and not gradually or at different time points (see Kontopantelis et al., 2015).

Another reason that the IRTS design was appropriate for this administrative study is the design can be used to determine the effectiveness of new policy retrospectively by reviewing the records from an administrative database (see Ting Fok et al., 2015; Turner et al., 2019). In this administrative study, I used data from the ISMS database to determine the effectiveness of the new policy, the PRT introduction, on the PR case closures in the PERSEC. Again, the data followed the IRTS trends of having a preintervention segment, a postintervention segment, a clear intervention time point, and the goal of studying the impact of the intervention (see Turner et al., 2019).

The PERSEC introduced the PRT because they wanted to improve the practice of PR case closures and mitigate the problem of PR case backlogs. Another essential pillar of IRTS is the design is used to determine effectiveness of policy changes and quality improvement programs within organizations (Ewusie et al., 2017). The IRTS design is effective when the observations are made to a single group (Ting Fok et al., 2015). In this administrative study, the single group being observed was PERSEC; consequently, I

chose the IRTS design to allow for PERSEC leadership to observe, through the data, the possible effectiveness of the quality improvement made to the PR case closures.

Another essential purpose of the introduction of the PRT was to interrupt the perceived trend the PR case closures were following during the first segment of the time series. The IRTS design was appropriate for this study because as Linden (2017) explained, the intervention is intended to interrupt the trend prior to the intervention. The PERSEC interrupted the trend in the time series with the creation and implementation of the PRT to improve the PR case closures. Turner et al. (2020) suggested that interruptions can be unintended, like an external factor, or intended, like a policy change. The policy change of the PRT was an intended interruption to impact the trend of PR case closures, and the IRTS design provided the crucial ability to understand the impact of the PRT on the trend.

Employment of Multiple Regression Analysis

A multiple regression is the most common analysis used to analyze IRTS data (Ewusie et al., 2020). I used the multiple regression outlined by Bernal et al. (2017) and Linden (2015) to analyze the data from the IRTS. This type of analysis aligned with this study because of the goal of the study and the observation size. Box and Tiao (1975) explained a paired samples t test would not be adequate because it relies on the assumption that variance of means happened independently. Another option would be to employ the auto regressive integrated moving average (ARIMA) method, but this method was not possible because it requires 100 or more observation points to properly use the technique (see Baicker & Svoronos, 2019). It is also suggested that there is no advantage

to using an ARIMA over regression for linear data that may contain autocorrelation (Matowe et al., 2003). I also considered using the Poisson regression but ultimately did not due to the data not following the model distribution rule that the mean and variance is the same (see Callas, 1994). I conducted a descriptive analysis of the total cases closed variable that resulted in the $m = 86.29$ and the variance = 6,695.259.

I used the following multiple segmented regression model provided by Bernal et al. (2017):

$$Y_t = \beta_0 + \beta_1 T + \beta_2 X + \beta_3 TX_t$$

A minimum of three variables are required for an IRTS analysis:

1. T : the time elapsed since the start of the study in with the unit representing the frequency with which observations are taken (e.g., month or year);
2. X : a dummy variable indicating the preintervention period (coded 0) or the postintervention period (coded 1); and
3. Y_t : the outcome at time t . (p. 4)

Looking closely at β_0 , β_1 , β_2 , and β_3 , Linden (2015) provided the following explanation:

β_0 represents the intercept or starting level of the outcome variable. β_1 is the slope or trajectory of the outcome variable until the introduction of the intervention. β_2 represents the change in the level of the outcome that occurs in the period immediately following the introduction of the intervention (compared with the counterfactual). β_3 represents the difference between pre-intervention and post-intervention slopes of the outcome (p. 481).

The β_3 variable is essential for the analysis because it is a combination variable of T (time elapsed) times X (intervention). Linden and Adams (2011) reinforced this position when they stated, “Thus, we look for significant P-values in either β_2 or β_3 (or both) to indicate a treatment effect” (p. 1232). I conducted an analysis of the data set based on the previous equation and principles.

Internal Validity

Before I carried out the analyses on the data, I considered internal validity concerning the PR cases being constant. A determination of the cases being constant stemmed from the method in which the PRT received and worked on the cases. The cases were not new incoming cases that the PERSEC received but were cases that were stored in ISMS due to the PR case backlog problem. Again, PR cases are conducted on all TSA personnel every 5 or 10 years without cause. The OPM provides the investigative functions for TSA background investigations. Once completed by the OPM, the case is uploaded into ISMS for a PERSEC specialist to make an adjudicative decision. When an adjudicative decision is made, the case is then considered closed. The PERSEC has no control over the time it takes for a background investigation to be completed. When considering the total case closed variable in this study, it only referred to the process of the PERSEC making an adjudicative decision on a PR case.

The PERSEC had access to the cases closed in the time series prior to introduction of the PRT and following the introduction of the PRT. There was no change in availability of PR cases from month to month during the time series. The cases were provided to the specialist on equal bases. Again, all cases closed during the time series

were cases from the PR case backlog and stored in ISMS. In the periods before the backlog, PR cases were provided to the PERSEC on a month-by-month cycle; however, due to the issues already stated with the OPM, large amounts of PR cases were sent to the PERSEC that caused a backlog in ISMS because the office was not able to handle the amount. The time series was used to review the PERSEC closure of PR cases located in the backlog prior to and after the organizational change of adding a PRT.

I also considered other threats to internal validity before the analyses were conducted on the data. There was no presence of a seasonality change that affected the closures of the PR cases prior to introduction and after the creation of the PRT. Another consideration was staffing changes, and other than the creation of the PRT to handle PR cases, there were no major staffing changes in the PERSEC to suggest a threat to internal validity. The procedure for closing PR cases did not change during the time series, which confirms there were no procedural changes that threatened internal validity. Additionally, the PERSEC did not experience any budgetary changes to the organization during the time series that would impact the PR case closures. Another consideration was information technology changes, which, again, were not experienced by the PERSEC during the time series. The PERSEC relied on ISMS both prior to and after the introduction of the PRT to complete the PR case closure process. Lastly, the time series took place prior to the COVID-19 pandemic, so work schedules, leave, and telework was not a threat to internal validity and remained relatively the same prior to and after the introduction of the PRT. These considerations of internal validity allow the variables and the results from the regression to be accepted as valid.

Findings and Implications

The goal of this study was to understand the PRT's impact on the PR case closures and if that impact was statistically significant. The use of regression provided the statistical analyses needed to answer the research question.

The first step in the analysis was reviewing the ISMS data provided by the PERSEC in the form of a Microsoft Excel spreadsheet. I checked all 2,071 PR cases that had been closed within the time series and organized the cases into the months that each case was closed in. Figure 1 shows each month in the times series and the total number of cases closed.

Figure 1

Total Number of Cases Closed in Time Series

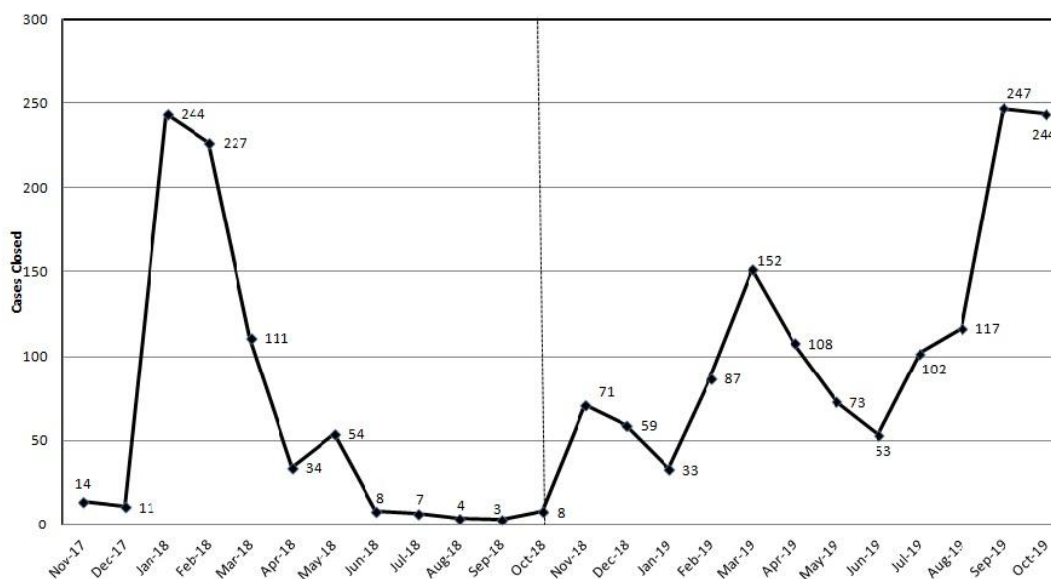


Figure 1 gives a snapshot of case closures, showing the highest number of cases closed before the PRT being 244 and the lowest number of cases closed before introducing the PRT being three. Figure 1 also shows the point of the intervention is in

October of 2018. The highest number of cases closed after introducing the PRT being 247, and the lowest number of case closures after introducing the PRT being 33. Again, the PR cases contained in the time series were available to the PERSEC prior to and after the introduction of the PRT. The PR cases used to represent the closures were contained in a backlog and were constant. Although Figure 1 provides insight into the PR case closures in PERSEC, it does not provide the statistical analysis needed to answer the research question.

The next step was to create the variables needed to plug into the equation. Table 1 displays the variables for the study, including their codes and the given values received from ISMS.

Table 1

Data Set Used for IRTS

Month	Total cases closed (Yt)	Months in Time Series (T)	Introduction of PRT (X)
11/2017	14	1	0
12/2017	11	2	0
1/2018	244	3	0
2/2018	227	4	0
3/2018	111	5	0
4/2018	34	6	0
5/2018	54	7	0
6/2018	8	8	0
7/2018	7	9	0
8/2018	4	10	0
9/2018	3	11	0
10/2018	8	12	1
11/2018	71	13	1
12/2018	59	14	1
1/2019	33	15	1
2/2019	87	15	1
3/2019	152	17	1
4/2019	108	18	1
5/2019	73	19	1
6/2019	53	20	1

7/2019	102	21	1
8/2019	117	22	1
9/2019	247	23	1
10/2019	244	24	1

Note. The variable *XT* was created later to run the analysis

I completed a multiple linear regression to determine the relationship between the independent variables of *introduction of PRT*, *months in time series*, and *interaction* and the dependent variable of *total cases closed* to determine the impact of the PRT's introduction on the PR case closures.

Assumptions Test

The assumption test for multiple linear regression was conducted to determine that the data met the criteria to be accepted as valid. The regression analysis was conducted and the graphs and tables from the output were used to check that the assumptions were met. The data analysis provided the following data output:

Table 2

Model Summary

Model	<i>R</i>	<i>R</i> ² Square	Adjusted <i>R</i> Square	Std. Error of the Estimate	Durbin- Watson
1	.629	.396	.305	68.204	1.165

Note. Predictors are constant, interaction, months in times series, and introduction of PRT on the dependent variable total case closed

Table 2 shows the model summary of the regression analysis. The assumption being tested is the independence of the residuals. Specifically, checking the Durbin-Watson value to determine if there is autocorrelations and how prevalent it is throughout the values. The $R^2 = .396$ and the $R_{adj}^2 = .305$. The R_{adj}^2 value means that 30 % of the variance in the dependent variable can be explained by the model. The Durbin-Watson

value is 1.165, which means there is some autocorrelation in the time series. Additional analysis was done to determine the level of autocorrelation.

Table 3

ACF and PACF for the Time Series, Box-Ljung Statistic

Lag	Autocorrelation	Std. Error	Value	df	p	Partial Autocorrelation	Std. Error
1	.540	.192	7.913	1	.005	.540	.204
2	.033	.188	7.945	2	.019	-.365	.204
3	-.049	.183	8.018	3	.046	.200	.204
4	-.010	.179	8.021	4	.091	-.103	.204
5	-.030	.174	8.051	5	.153	-.006	.204
6	.001	.170	8.051	6	.234	.070	.204
7	-.042	.165	8.116	7	.322	-.164	.204
8	-.145	.160	8.936	8	.348	-.050	.204
9	-.115	.155	9.484	9	.394	.036	.204
10	-.040	.150	9.556	10	.480	-.069	.204
11	-.158	.144	10.749	11	.465	-.218	.204
12	-.202	.139	12.873	12	.378	.058	.204
13	-.080	.133	13.240	13	.429	-.036	.204
14	-.065	.127	13.503	14	.487	-.136	.204
15	-.202	.120	16.343	15	.360	-.171	.204
16	-.207	.113	19.695	16	.234	-.040	.204

Note. Series is for Total case closed

Table 3 shows the autocorrelation and the partial autocorrelation for the series *total case closed*. The low Durbin-Watson value in Table 2 is confirmed in Table 3 with some p-values being significant, which means there is autocorrelation. In lag1, the p value is .005. In lag 2, the p value is .019. In lag 3, the p value is .046. In lag 4, the p value is .091. Although there is significance in the first three lags, all other values in the series are $p > 0.05$. The small amount of autocorrelation is not significant and the subject model was still fit for IRTS (Linden, 2015).

The next assumption reviewed was the test for normality. The assumption test seeks to determine that the residuals are normal distributed throughout the model. The

assumption is tested by viewing the relationships of the points to the line, and does the points tightly wrap around the line as it moves up. The closer the points are to the line, the more it can be concluded that the residuals were normally distributed. The points in Figure 2 are relatively close to the line as it moves up. Although there are some points that come off the line, it can be concluded that the assumption for normality is satisfied. Additionally, Figure 3 can reinforce the assumption test by showing the curve of the line follows the frequency of the values on the figure. The figure reinforces the assumption that the errors are normally distributed in the model.

Figure 2

Normal P-P Plot of Regression Standardized Residual

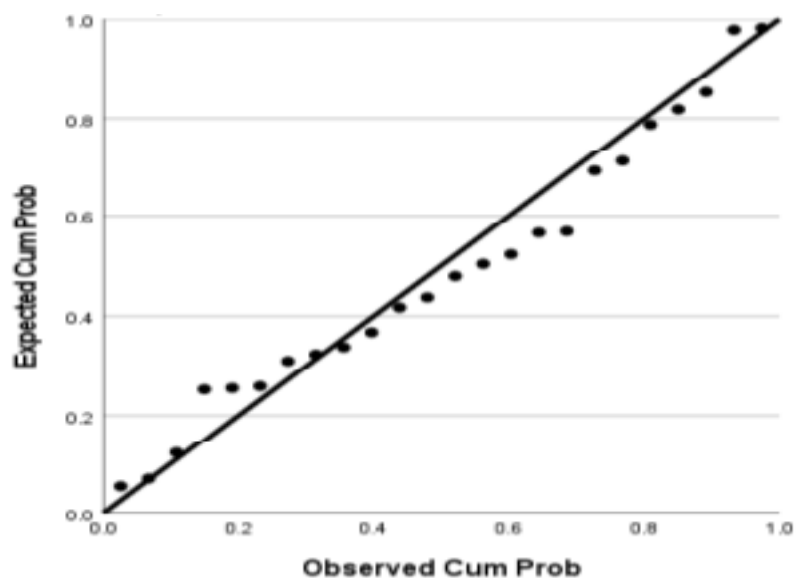
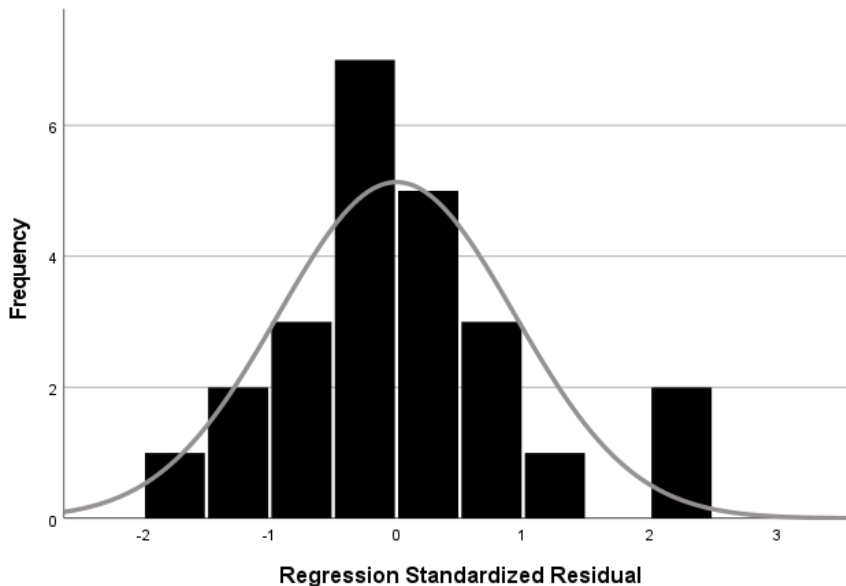


Figure 3*Histogram*

The next assumption reviewed was homoscedasticity. The assumption is used to determine if the variance of the residuals are constant. For the assumption of homoscedasticity, the regression standardized residual (ZRESID) and the regression standardized predicted value (ZPRED) are used as the Y-axis and X-axis to determine if the residuals are constant. Figure 4 shows the scatter plot and results of the assumption. The points on the graph are random around zero, and do not take the shape of a funnel or cone. The assumption for homoscedasticity has been satisfied.

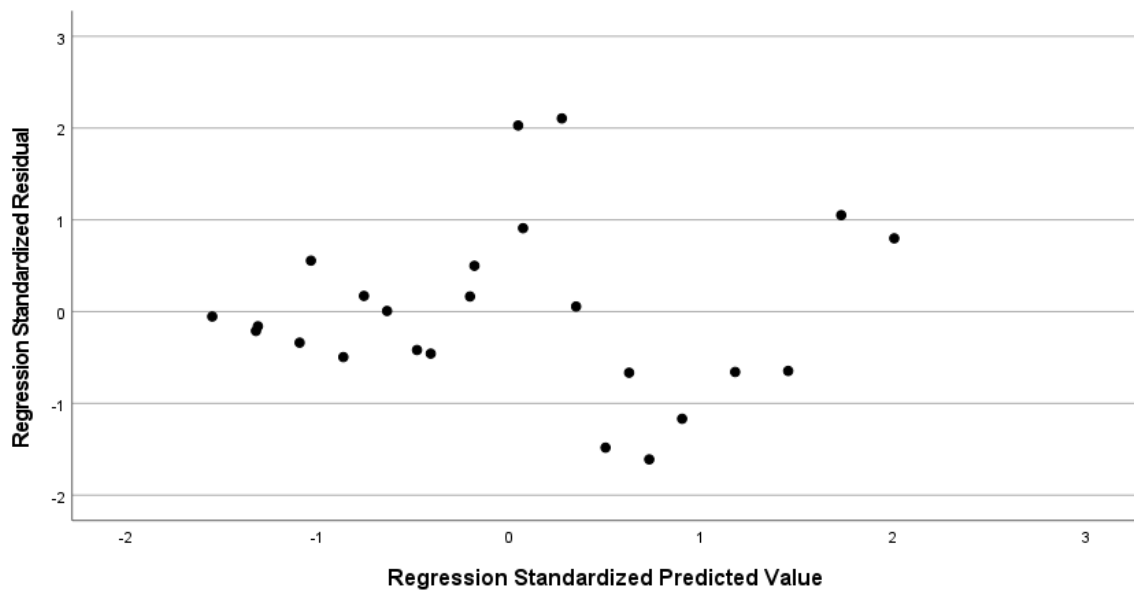
Figure 4 can also be used to test the assumption that there are no outliers contained in the data. For the residual values, the points should fall within -3 and 3 on the X-axis and Y-axis. Values that are outside the range are considered outliers and should be removed, if possible. The points in Figure 4 do not exceed 3 or -3 on the axis. Because all

the points fall within the accepted range, it can be determined that the assumption for outliers is satisfied.

Again, Figure 4 can be used to conduct the assumption for homogeneity. The test for homogeneity is conducted to determine that the variance of the outcomes is evenly spread out across the line. The scatter plot shows the variance of the residual points and their relation to a line, if drawn across the middle of the points. Figure 4 shows the variance in the points is randomly and evenly spread across the imaginary line in the middle. The points in the figure allow the assumption of homogeneity to be satisfied.

Figure 4

Scatter Plot Using ZRESID and ZPRED



Next, the assumption for no multicollinearity was tested. The assumption test seeks to determine if the relationships between the independent variables are highly correlated. Generally, the goal for the assumption is to have a low value for the correlations between the independent variables. Table 4 shows the correlation values for

the independent variables in the model. The values for the correlations are high, consisting of .956, .942, and .864. The results show that there is correlation between the independent variables and the assumption test for multicollinearity has been violated. The cause of the high correlation can be attributed to IRTS multiple regression equation being used in the study. The creation *TX* variable (interaction) would result in correlation because the variable is a combination of the other two independent variables. Another factor that can be used to mitigate the violation is that the variables, excluding the *months in time series*, are dummy variables and therefore, the only adjustment that could be made to the independent variables would be the *months in time series*. The adjustment to *months in time series* to fix the correlation problem would not be plausible since the variable, in its current state, is essential for the IRTS model. Based on these previously stated factors, and based on the other assumption test, it is acceptable to view the results of the regression as valid.

Table 4

Correlations

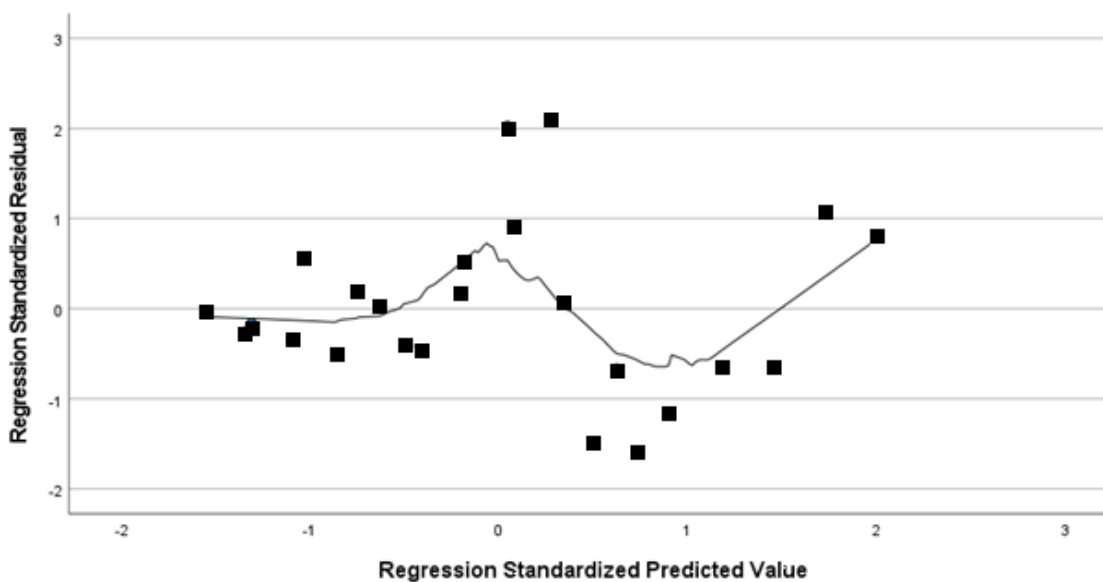
	Introduction of PRT	Interaction	Month in Time Series
Introduction of PRT	1	.956	.864
Interaction	.956	1	.942
Month in time Series	.864	.942	1

Lastly, the assumption test for linearity was reviewed. The test is done to determine if the relationships between the independent variables and the dependent variable if viewed on a plot, would be randomly plotted on both sides of zero and would not follow a visual pattern. The points in Figure 5 show the results are random and are visible on both sides of zero. Additionally, the Lowess smoother was applied to the

dependent variable, *total case closed*, to determine if there is a relationship between the predictor values and the residuals. Figure 5 outlines the results and shows there is no relationship between the predictor values and residuals. The results are an indicator that there is no gross violation of linearity. Thus, the assumption for linearity is satisfied.

Figure 5

Lowess Smoother Scatter Plot



Multiple Linear Regression

Again, a multiple linear regression was completed to determine the independent variables, *introduction of PRT*, *months in time series*, and *interaction* on the dependent variable, *total case closed*, to determine the impact of the introduction of the PRT on the PR case closures.

In Table 5, the *ANOVA* analysis is presented with $F = 4.368$, with 3 and 20 degrees of freedom. Table 4 also shows a “*Sig*” value for F as .016, which is significant. With these previous values, a significant regression equation was found ($F(3,20) = 4.368$,

$p < .05$), with $R_{adj}^2 = .305$. It can be determined that the independent variables (*interaction, months in time series, and introduction of PRT*) had a statistically significant impact on the dependent variable (*total case closed*).

Table 5

ANOVA

	Model	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	Sig.
1	Regression	60955.157	3	20318.386	4.368	.016
	Residual	93035.801	20	4651.790		
	Total	153990.958	23			

Note. Dependent Variable is total case closed and predictors are (constant), interaction, Months in time series, and introduction of PRT.

Table 6 shows the coefficients of the multiple regression analysis. Again, the $R_{adj}^2 = .305$, indicating that 30.5% of the variance in the series can be explained by the model. The slope (β_1) has a coefficient value of -1.013 and a p value of .087, which means prior to the intervention, there was no significant change of the dependent variable from month to month. The intervention (β_2) has a coefficient value of -1.787 and a p value of .011, which means immediately after the intervention, there was a significant change of the dependent variable. The change in slope (β_3TX) has a coefficient value of 3.038 and a p value of .005, which means interaction of intervention (X) and time in the series (T) had a significant impact on the dependent variable's change from month to month after the intervention. The results produced the following multiple regression model equation:

$$Y = 135.491 + 1.013(\textit{Time}) + 1.787(\textit{Intervention}) + 3.038(\textit{Interaction})$$

Table 6*Results of IRTS Analysis*

Model			Coefficient	SE	t	p
1	Constant (β_0)	Intercept	135.491	44.105	3.072	.006
	Months in time series (β_1)	Slope	-1.013	6.503	-1.802	.087
	Introduction of PRT (β_2)	Intervention	-1.787	102.880	-2.793	.011
	Interaction (β_3)	Change in slope	3.038	8.237	3.149	.005

Note. Dependent variable is total case closed.

Discussion

Based on the findings in the multiple linear regression, the research question of what was the impact of the PRT creation on the case closures in PERSEC can be answered with the rejection of the null hypothesis. The data shows the *introduction of PRT (β_2)* and the *interaction (β_3)* variable has statistically significant impact on PR case closures during the time series. The hypothesis of there was a statistically significant difference in the PR cases closed by PERSEC after the PRT introduction compared to the PR case closures before the PRT introduction during a similar period is confirmed by β_2 's *p* value of .011 and β_3 's *p* value of .005. According to Linden (2015) and Linden and Adams (2011), the intervention can be considered significant when β_2 or β_3 or both are statistically significant. The intervention of the PRT by PERSEC leadership was significant and had a statistically significant impact on the PR case closures.

Using regression in IRTS provides a sufficient analysis for understanding the impact of intervention during a time series (Penfold & Zhang, 2013). Bernal et al. (2016) explained ITRS studies have strong external validity and provide a deeper insight on the impact of the intervention than randomized controlled trails. A crucial reason for

selecting regression for the IRTS is because it allowed for testing of change in the intercept and the change in the slope (Penfold & Zhang, 2013). Ewusie et al. (2020) reinforced the position that multiple regression is the most common use method to analyze IRTS studies. The common use of the regression in IRTS could be due to the strength the analysis has in discovering intended consequences and unintended consequences (Penfold & Zhang, 2013).

An unanticipated outcome in the study is the data shows PR case closures were on a downward slope until the PRT's introduction. Prior to receiving the data, the belief was the cases were not being closed at a rate to mitigate the case backlog. Again, Figure 1 shows the PRT did improve the overall PR case closures after the PRT, but the regression analyses confirm the impact did raise to statistical significance.

The implication of the findings on the PRT individuals is the improvement made to the way PRs were closed to fix the case backlog was statistically significant. Therefore, the team was a needed OC and successfully mitigated the PR case backlog. The implication of the findings on the organization is PERSEC's OC was successful in helping the problem, and the administration should set in place additional policies to mitigate the case backlog problem reoccurring.

The implication of the findings on the PR closure's government system is more studies need to be conducted to determine if adding a PRT is an effective way of mitigating PR case backlogs in other organizations. The system can also use the findings to improve PRT introduction in similar organizations to PERSEC. The study's implication on social change is the study provides a blueprint for leadership in the field to

employ OC to mitigate the problem. The study also impacts social change by improving how PRs are processed, ensuring that government agencies will have a tool to keep their workforce integrity and accomplish the organizational missions.

Recommendations

The results of this quantitative study confirmed the introduction of the PRT by PERSEC leadership was the OC needed to mitigate the PR case backlog problem. The following recommendations are suggestions to improve the PR case closure process to prevent the problem in the future. PERSEC leadership, along with the data, should use the recommendation to determine the next steps in mitigating the organization's problem.

The first recommendation is for the organization to request PRs processing sooner than the standard five or ten years. The Office of Management and Budget (2014) highlighted that shortening the time between investigations would improve productivity and allow the organization to notice possible issues with their workforce earlier, reducing potential risk. The recommendation adoption would help the PERSEC prevent a PR case build-up by spacing out the completed cases needing adjudication.

Another recommendation is prioritizing the cases by using a risk-based approach to working on cases. All PR cases do not present the same issues, and some require additional time because they are flagged for having high-risk issues. PERSEC should instruct the PRT leadership to work on low-risk issue cases first and then complete the cases that have problems, saving time and increasing productivity (Office of Management and Budget, 2014).

Future research looking to address PR case backlog issues should look at the average time it takes for a PR case to be closed, not just the total case closures. A study should also look to employ a mixed-method design that looks at the quantitative data of case closures and the qualitative data of what obstacles in organizations slows case closures down. Future researchers should also consider other background investigation numbers closure rates and compare those to the PR numbers to determine if the problem is just with PR cases and what is working for other background investigation closures and if it could be applied to PR cases.

Strength and Limitations of the Project

This study's strength is it provided statistically significant data on the impact of the creation of the PRT to mitigate case backlog. Also, the study's strength is the study provides literature to the PERSEC leadership that shows OC improved the case backlog problem. Still, additional steps are needed to mitigate and prevent PR case backlogs in the future. However, a limitation of the study is the small sample size within the time series. Another limitation to the study is that the quantitative data does not consider organizational and work environment issues, which could impact the PRT's ability to close cases. This study could be used for future research of PERSEC like organizations looking to improve PR case closures.

In Section 4, I presented the study's findings, rejecting the null hypothesis, which answered the research question that the PRT introduction had a statistically significant impact on the PR case backlog problem. I also outlined the strengths and limitations of this study and gave recommendations for the organization and future research studies. In

Section 5, I outline how I will disseminate the results of this study to the PERSEC leadership.

Section 5: Dissemination Plan

In Section 4, I outlined data collection and analysis and provided recommendations. In this section, I explain the plan to disseminate the study and summarize the PAS. I will provide the client organization with a one-page summary of the research and a page of figures from the study that show an IRTS plot chart. I will also schedule a meeting with the PERSEC leadership after reviewing the study summary to discuss the study findings, make recommendations, and propose possible future studies. A copy of this study will also be provided to TSA to review for possible sensitive information disclosure before future publishing.

The audience for this study is other federal personnel security sections facing case backlog problems. The study can also be used by government agencies interested in introducing organizational change policy to improve productivity and functionality. Another appropriate venue for dissemination is for government agencies that want a new method to mitigate a work backlog problem. Lastly, the study can be used for leadership conferences, training, and research material.

Summary

With this study, I aimed to determine the effectiveness of the PRT's introduction by the PERSEC leadership to mitigate the PR case backlog problem. Through the use of the quantitative, quasi-experimental, IRTS design, I accurately outlined the impact of the PRT's introduction on the problem plaguing the PERSEC. The PERSEC required this PAS to provide statistical data to the PERSEC leadership to determine the OC's success and if additional changes were needed. The PERSEC leadership's introduction of the

PRT was beneficial to the PR case backlog mitigation and the TSA mission accomplishment.

References

- Administration of Donald Trump. (2019). *Executive order 13869: Transferring responsibility for background investigations to the Department of Defense*. The White House.
- Administration of William Clinton. (1995). *Executive order 12968: Access to classified information*. The White House.
- Alase, A. O. (2017). The tasks of reviewing and finding the right organizational change theory. *IJELM*, 5(2), 198-215. <https://doi.org/10.17853/ijelm.2017.2631>
- Armenakis, A. A., & Bedeian, A. G. (1999). Organizational change: A review of theory and research in the 1990s. *Journal of Management*, 25(3), 293–315. <https://doi.org/10.1177/014920639902500303>
- Armenakis, A. A., Bernerth, J. B., Pitts, J. P., & Walker, H. J. (2007). Organizational change recipients' beliefs scale: Development of an assessment instrument. *The Journal of Applied Behavioral Science*, 43(4), 481–505. <https://doi.org/10.1177/0021886307303654>
- Baicker, K., & Svoronos, T. (2019). *Testing the validity of the single interrupted time series design* (NBER Working Paper No. 26080). National Bureau of Economic Research. <http://www.nber.org/papers/w26080>
- Bakari, H., Hunjra, A., & Niazi, G. (2017). How does authentic leadership influence planned organizational change? The role of employees' perceptions: Integration of theory of planned behavior and Lewin's three step model. *Journal of Change Management*, 1-33. <https://doi.org/10.1080/14697017.2017.1299370>

- Bernal, J., Cummins, S., & Gasparrini, A. (2017). Interrupted time series regression for the evaluation of public health intervention: A tutorial. *International Journal of Epidemiology*, 46(1), 348-355. <https://doi.org/10.1093/ije/dyw098>
- Bernal, J., Soumerai, A., & Gasparrini, A. (2018). A methodological framework for model selection in interrupted time series studies. *Journal of Clinical Epidemiology*, 1-24. <https://doi.org/10.1016/j.jclinepi.2018.05.026>
- Berger, B. (2019). *U.S. security clearances: Reducing the security clearance backlog while preserving information security* (Publication No. 0704-0188). [Master's thesis, Naval Postgraduate School]. Department of Defense
- Box, G., & Tiao, G. (1975). Intervention analysis with applications to economic and environmental problems. *Journal of the American Statistical Association*, 70(349), 70-79.
- By, R., Kuipers, B., & Procter, S. (2018). Understanding teams in order to understand organizational change: The OTIC model of organizational change. *Journal of Change Management*, 18(1), 1-9.
<https://doi.org/10.1080/14697017.2018.1433742>
- Callas, P. (1994). *Empirical comparisons of logistic regression, Poisson regression, and Cox proportional hazards modeling in analysis of occupational cohort data* (Publication No. 9510451) [Doctoral dissertation, University of Massachusetts]. ProQuest Dissertations and Theses Global.

Cameron, E., & Green M. (2009). *Making sense of change management: a complete guide to the models, tools & techniques of organizational change* (2nd Ed.).

Kogan Page.

Celik, A., & Nadir, O. (2016). Organizational change: Where have we come from and where are we going? *IJARAFMS*, 6(1). 134-141.

<https://doi.org/10.6007/IJARAFMS/v6-i1/2004>

Committee on Armed Services. (2018). *Security clearance processing status report* (H.A.S.C. No. 115-123). U.S. House of Representatives

Committee on Oversight and Government Reform. (2016). *Incorporating social media into federal background investigations*. U.S. House of Representatives

Committee on Oversight and Government Reform. (2017a). *Improving security and efficiency at OPM and the National Background Investigations Bureau* (Serial No. 115-12). U.S. House of Representatives

Committee on Oversight and Government Reform. (2017b). *Security clearance investigation challenges and reforms* (Serial No. 115-41). U.S. House of Representatives

Department of Defense. (2016). *Department of Defense suitability and fitness guide* (Version 1.0).

Department of Homeland Security. (2016). *The Department of Homeland Security personnel security, suitability and fitness program* (DHS Instruction 121-01-007-01).

Ewusie, J., Blondal, E., Soobiah, C., Beyene, J., Thabane, L., Straus, S., & Hamid, J.

(2017). Methods, applications, interpretations and challenges of interrupted time series (its) data: Protocol for a scoping review, *BMJ Open*, 7(1), 1-4.

<https://doi.org/10.1136/bmjopen-2017-016018>

Ewusie, J., Thabane, L., Beyene, J., Straus, S., & Hamid, J. (2020). Multicenter

interrupted time series analysis: Incorporating within and between-center heterogeneity. *Clinical Epidemiology*, 12(1), 625-636.

<https://doi.org/10.2147/CLEP.S231843>

Government Accountability Office. (2017). *Personnel security clearances: Additional actions needed to ensure quality, address timelines, and reduce investigation backlog* (GAO-18-29).

Government Accountability Office. (2018). *Personnel security clearances: Additional actions needed to implement key reforms and improve timely processing of investigations* (GAO-18-431T). Select Committee on Intelligence, U.S. Senate.

Hansen, M. (2018). *Cultivating change: The relationship between organizational culture, leadership style and communication style with organizational change*.

(Publication No. 10690070) [Master's thesis, Marquette University]. ProQuest Dissertations and Theses Global

Heckelman, W. (2017). Five critical principles to guide organizational change. *OD*

Practitioner, 49(4), 13-21. [http://wlhconsulting.com/wp-](http://wlhconsulting.com/wp-content/uploads/2018/11/ODP-Five-Critical-Principles-to-Guide-Organizational-Change.pdf)

[content/uploads/2018/11/ODP-Five-Critical-Principles-to-Guide-Organizational-Change.pdf](http://wlhconsulting.com/wp-content/uploads/2018/11/ODP-Five-Critical-Principles-to-Guide-Organizational-Change.pdf)

- House Homeland Security Committee. (2016). *Misconduct at TSA threatens the security of the flying public*. U.S. House of Representatives.
- House Homeland Security Committee. (2017). *Preventing the next attack: TSA's role in keeping our transportation system secure* (No. 115-37). U.S. House of Representatives.
- Kontopantelis, E., Doran, T., Springate, D., Buchan, I., & Reeves, D. (2015). Regression based quasi-experimental approach when randomization is not an option: Interrupted time series analysis. *BMJ*, 350(1), 1-4.
<https://doi.org/10.1136/bmj.h2750>
- Krishnan, R. (2018). *Organizational change readiness: Effects of organizational structure and leadership communication in organizational change*. (Publication No. 10791024) [Doctoral dissertation, University of Maryland University College]. ProQuest Dissertations and Theses Global
- Lewin, K. (1947). Frontiers in group dynamics: Concept, method and reality in social science; social equilibrium and social change. *Human Relations*, 1(1), 5-41.
<https://doi.org/10.1177/001872674700100103>
- Linden, A. (2015). Conducting interrupted time-series analysis for single- and multiple-group comparisons. *The Stata Journal*, 15(2), 480-500.
- Linden, A. (2017). A comprehensive set of postestimation measures to enrich interrupted time-series analysis. *The Stata Journal*, 17(1), 73-88.
- Linden, A., & Adams, J. (2011). Applying a propensity score-based weighting model to interrupted time series data: Improving causal inference in programme evaluation.

Journal of Evaluation in Clinical Practice, 17(1), 1231-1239.

<https://doi.org/10.1111/j.1365-2753.2010.01504.x>

Lynch, S. E., & Mors, M. L. (2018). Strategy implementation and organizational change:

How formal reorganization affects professional networks. *Elsevier*, 1-16.

<https://doi.org/10.1016/j.lrp.2018.02.003>

Matowe, L., Leister, C., Crivera, C., & Korth-Bradley, J. (2003). Interrupted time series

analysis in clinical research. *The Annals of Pharmacotherapy*, 37(1).

<https://doi.org/10.1345/aph.1A109>

National Counterintelligence and Security Center. (2015). *2015 Annual report on security*

clearance determination. Office of Director of National Intelligence

Naveed, R., Khalid, N., & Baloch, I. (2018). Review of organizational change

phenomenon in culture team organization and individual concluded supportive

workforce. *Journal of International Business and Management*, 1(2), 1-11.

Office of Human Capital. (2017). *TSA management directive no. 1100.30-31: Debarment*

of applicants. Transportation Security Administration

Office of Inspector General. (2009). *The DHS personnel security process (OIG-09-65)*.

Department of Homeland Security.

Office of Inspector General. (2012). *Personnel security and internal control at TSA's*

Legacy Transportation Threat Assessment and Credentialing Office (OIG-13-05).

Department of Homeland Security.

Office of Management Budget. (2014). *Suitability and security processes review report*

to the president: Executive summary. The White House.

- Panayiotou, A., Putnam, L., & Kassinis, G. (2019). Generating tensions: A multilevel, process analysis of organizational change. *Sage*, 17(1), 8-37.
<https://doi.org/10.1177/1476127017734446>
- Penfold, P., & Zhang, F. (2013). Use of interrupted time series analysis in evaluation health care quality improvements. *Academic Pediatrics*, 13(6S), 38-44.
- Petrou, P., Demerouti, E., & Xanthopoulou, D. (2016). Regular versus cutback-related change: The role of employee job crafting in organizational change contexts of different nature. *International Journal of Stress Management*, 1-24.
<https://doi.org/10.1037//str0000033>
- Schneider, K., Smith, C. M., Gallagher, R. W., Osborn, M. M., & Dickerhoof, R. (2019). *A personnel security-training program for clinicians: Phase II (PERSERC-TR-19-01)*. Department of Defense.
- Security Executive Agent. (2017). *National security adjudicative guidelines, Security Executive Agent (Directive 4)*. Office of Director of National Intelligence.
- Security Executive Agent. (2018). *Continuous evaluation (Directive 6)*. Office of Director of National Intelligence.
- Talat, U., Chang, K., & Nguyen, B. (2017). Decision and intuition during organizational change: An evolutionary critique of dual process theory. *The Bottom Line*, 1-26.
<https://doi.org/10.1108/BL-08-2017-0016>
- Ting Fok, C., Henry, D., & Allen, J. (2015). Research designs for intervention research with small samples II: Stepped wedge and interrupted time-series designs. *Prev Sci*, 16(7), 967-977. <https://doi.org/10.1007/s11121-015-0569-4>

- Turner, S., Karahalios, A., Forbes, A., Taljaard, M., Grimshaw, J., Korevaar, E., Cheng, A., Bero, L., & McKenzie, J. (2020). Creating effective interrupted time series graphs: Review and recommendations. *JRSM*, *12*(1), 106-117.
<https://doi.org/10.1002/jrsm.1435>
- Turner, S., Karahalios, A., Forbes, A., Taljaard, M., Grimshaw, J., Cheng, A., Bero, L., & McKenzie, J. (2019). Design characteristics and statistical methods used in interrupted time series studies evaluating public health intervention: Protocol for a review. *BMJ Open*, *9*(1), 1-7. <https://doi.org/10.1136/bmjopen-2018-024096>
- U.S. Congress. (2004). *Intelligence Reform and Terrorism Prevention Act of 2004* (Public Law 108-458).
- U.S. Congress. (2017). *National Defense Authorization Act for Fiscal Year 2018* (Report 115-404).
- Van de Ven, A., & Poole, M. (1995). Explaining development and change in organizations. *Academy of Management Review*, *20*(3), 510-540.
- Wagner, A., Soumerai, S., Zhang, F., & Ross-Degnan, D. (2002). Segmented regression analysis of interrupted time series studies in medication use research. *Journal of Clinical Pharmacy and Therapeutics*, *27*(1), 299-309.

Appendix A: Disclaimer

The views expressed in this professional administrative study are those of the author and do not reflect the official policy or position of the Transportation Security administration or the Department of Homeland Security.