

**An Evaluation of the Impact of the NFL's Super Bowl event on the Host Cities'
Crime Rates**

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An Applied Research Project
(Political Science 5397)
Submitted to the Department of Political Science
Texas State University
In Partial Fulfillment
For the Requirements for the Degree of
Masters of Public Administration

(Fall 2014)

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Abstract

This study evaluates the impact of the National Football League's Super Bowl event on the crime rates of the host city. A review of the literature suggests that there is a positive relationship between sporting events and crime. The Routine Activities Theory operates under the idea that when there is the presence of a motivated offender, a suitable target, and the absence of a capable guardian, crime has the opportunity to occur. Large sporting events provide the opportunity for these three elements to take place.

The analysis for this research has been executed utilizing existing data from the Federal Bureau of Investigations on the following 8 crimes: murder, force rape, robbery, aggravated assault, simple assault, burglary, larceny and motor vehicle theft.

The trends before the event, after the event and during the month of the event were measured for each of the 8 crimes of several host cities ranging from years 1990 and 2012. An interrupted time series design was used to test the hypotheses. The findings of this study suggest that the Super Bowl event does not have a significant impact on the crime rate of the host city.

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Chapter 1 - Introduction

On February 2, 2014, the MetLife stadium in East Rutherford, New Jersey hosted 82,529 fans for the Super Bowl XLVIII (Jorgensen 2014). The National Football League's Super Bowl Event, is one of the most popular events in the United States. Many cities would like to host this event because of the financial gain, popularity and tourism associated with it. The Super Bowl in 2013 generated around \$480 million in spending in the city of New Orleans (Waller, 2013). Will Brinson, an NFL writer for CBS Sports mentioned that "Super Bowl bids are unquestionably competitive. It's tough to become a finalist..." (2014). There are certain criteria that cities have to meet to be considered as the host city for a Super Bowl. It is the NFL owners that enter in the voting process for the final city.

The Super Bowl in general is a very profitable event and draws the attention of millions of fans. Forbes reported that "the ten most valuable Super Bowls have generated a total of \$1.7 billion in advertising revenue" (2014).

The city who hosts the Super Bowl event expects a large number of spectators and stakeholders to arrive for the event. A sudden increase in population for a short amount of time can attract all sorts of good and bad situations. An example of a good and convenient situation is the income the city will generate which is good for the local economy. Unfortunately, a bad situation example is the narrowed ratio of law enforcement per X amount of individuals for that short period of time. Ensuring public safety should be one of the major preparations.

Research Purpose

The purpose of this research is to evaluate the impact of hosting the National Football League's Super Bowl event on the local crime rates of the host city. This study will seek to assess the local crime rates of cities from 1980 to 2013 before and after hosting the Super Bowl event. The findings of this study should assist the body of existing literature on sporting events and crime as well as the local law enforcement departments and city officials of future host cities.

Chapter Summaries

Chapter Two will present a review of the literature supporting the origin of this study. It will describe the history of sporting events and how tourism takes on a great part of this sport culture. The Super Bowl event will be explained as well as the Routine Activities Theory. The conceptual framework and research hypotheses will be located in this chapter as well.

Chapter Three explains the methodology for this study. The design chosen to test the hypotheses will be described as well as all variables identified for the analysis. The hypotheses for this research will be operationalized in this chapter and the statistical approaches utilized for testing analysis will be presented.

Chapter Four will analyze and interpret the results and findings of the study. The findings are reported on a table, which contains the output of the analysis. IBM's SPSS program has been utilized to execute all analyses for this study.

Chapter Five will summarize the interpreted results from chapter four and provide suggestion for further research. The research limitations are discussed in this chapter, as well as the theories behind the findings from chapter four.

Chapter 2 - Literature Review

Chapter Purpose

This chapter will examine scholarly literature pertaining to the relation between crime, tourism and sporting events. The chapter will first introduce the meaning of a sporting event and its relation to spectators and tourists. The sporting event of focus for this study, The United State's National Football League's Super Bowl event, will follow with an explanation of the event, its origin and the fans. Based on the literature, the Routine Activity Theory has been identified as this research's theoretical foundation. This chapter will also provide a description of the routine activity theory followed by supporting literature linking crime to large sporting events. Based on the routine activity theory and the linkage of crime to sporting events' literature, a set of hypotheses will be developed pertaining to the National Football League's Super Bowl event.

Introduction

The culture of countries can be defined by their sports and the traditions that revolve around them. Tailgating, for instance, is a rather popular tradition in the United States that provides the opportunity for friends and family to convene and enjoy time together before a game. "Sport is a vital aspect of culture..."(Isgro, et al. 2012, 172) and it has the power to convene thousands of individuals for one lone purpose. Sport events have attracted thousands of individuals for many, many years.

Individuals' reasons for attending sporting events can vary greatly. Some people attend to support their team, or player, or contestant. A study performed in Australia searched for answers in respect to sport fan socialization and the major impacts and

influences that attracted the individuals who participated in their study (Melnick and Wann 2010). Interestingly enough, the participants' fathers were the most influential agent followed by their favorite player (Melnick and Wann 2010, 462).

The gathering of spectators and tourists for major sporting events is overall a grand experience, but this substantial temporary increase in population could also open the doors to other, not so grand or fortunate events, such as crime.

There should be no question about the importance of public safety; whether it is on routine daily activities or for the purpose of large events. Not much literature has been carried out pertaining to crimes and sporting events. Most of what researchers have explored is crimes within teams or acts committed by the players, but not necessarily the impact of the event on society. The demographics of the fans have also not been looked into. In fact, Szabo (1996, 408) who analyzed the social and demographic characteristics of Hungarian football fans, presents an interesting perspective on the lack of research in this subject, "...sport sociologists wanted to avoid open confrontation and that is why they declined studying this delicate topic, that presumably would have led to criticism of the macrostructure, of the current political regime." Given that sporting events go back many years, it is an area that should be further analyzed. It is important to look into the effect that major sporting events cause on society. Such research could assist in keeping individuals safe and executing further safety measure in the host location.

History of Sporting Events

The history of sports goes back thousands of years. Along with its history of existence also comes the history of those who attend the sporting event as spectators. Within the masses of spectators, some individuals were local and others came from

different areas, tourists. Some examples of sporting events that attracted tourists many years ago were the gladiatorial events in the Roman period, shooting and arching competitions, the medieval and Renaissance jousting (Huggins 2013, 109). Tourism and sport events have been related throughout several historical periods in historical overviews. This is a connection that has been established before the medieval times and that has continued to grow with increasing linkages between sport and tourism in the industrial age (Huggins 2013, 110). With the advancements in technology and the democracy of broadcast television, sports now attract more individuals in general and also a more diverse array of social classes (Quinn 2009). “Today sport is a global, multibillion dollar industry, a dominant and defining force in millions of lives, and a major contributor to the overall tourism industry...” (Huggins 2013, 107). Sporting events can be a grand opportunity for the hosting city in many regards, especially with the amount of individuals that attend from out of town.

Tourism

Major events and attractions draw many individuals to convene in one location for a period of time. That location can be a nation, state, city, stadium etc., and the duration of this can range from a few hours to a few weeks. The locations hosting the events or providing the attractions can gain great economic benefit with the increase in tourism. Studies have found that unfortunately the economy is not the only area that increases. A study by Dee Wood Harper (2001) examined tourists’ victimization during major sporting events (1053). The author states that in most cases, the tourists will have experienced a higher crime rate, especially in crimes such as larceny, theft and robbery, than the local population of the host location (Harper 2001, 1053). The findings of this

study supported the notion that locations where tourists convene can be “hot spots” for certain crimes. “Where there is a high concentration of adult entertainment venues... tourists will tend to congregate... to the extent that they are viewed by the criminal element as easy targets of victimization” (Harper 2001, 1055).

Another study examined the overall relationship between seasons in crime and tourism for Miami, Florida from the years 1963 to 1966 (McPheters & Stronge, 1974). Similar to Harper’s study, McPheters and Stronge (1974, 290) concluded that “the number of criminal events in a geographical area may be influence by seasonal factors; specifically an influx of tourist. Crime is to some extent an externality or by-product of a tourist industry. Kaplanidou et al. (2013, 633) also provided supporting literature that issues such as “crowding, traffic, parking problems, increased crime...” can also be associated with increase in tourism.

The fact that there is a sudden rise in the number of individuals present at the same location, such as a stadium, will increase the number of motivated offenders (Breetzke & Cohn, 2013, p. 391). Regardless of possible risks associated with the travel and attendance to sporting events, research has shown that risks and personal problems do not prevent, nor limit, the attendance of the sport event by the tourists (Hemmatinezhad et al., 2010, 360). Sporting events tend to draw large numbers of spectators. Many of the spectators do not tend to be from the area where the event is being hosted. One of the major and most watched sporting event in the United States of America is the National Football League’s Super Bowl event.

Super Bowl Event

The first Super Bowl event was the result of the National Football League and the American Football League's end of season championship game January 15, 1967 following the 1966 season (*Super Bowl*, 2014). The Green Bay Packers and the Kansas City Chiefs played this game with an ending score of 35-10, in which the Packers took the win. The name "Super Bowl" was not officially utilized until 1969; it was first called the AFL-NFL World Championship Game (*Super Bowl*, 2014). Both leagues then merged into what is now known as the National Football League (NFL) and they were both re-named as conferences, the American Football Conference and the National Football Conference. That 1967 game started an American tradition that has continued to grow every year and has become part of American culture.

The Super Bowl event is one that draws millions of spectators to the host location every year. The last five Super Bowls have been the most watched TV programs in history (Koba 2014) with the 2014 Super Bowl currently holding the record for the most viewed television broadcast in American History at 112.1 million (Bibel 2014). In 2006 the United States Department of Agriculture informed that the Super Bowl Sunday came in second after Thanksgiving for the highest day of food consumption in the United States (Conley and Baun 2006). Not only does most of the United States tune in to view this sporting event, but also many individuals travel to the host location every year. The Rose Bowl Stadium holds the record for largest attendance audience, 103,985, at the event in 1980 (*History*, 2014). The teams who played the Super Bowl XIV game that year were the Los Angeles Rams and the Pittsburgh Steelers (*History*, 2014). Below is a map of the cities and regions that have hosted the event since its enactment.

Figure 2.1 Map of Super Bowl host cities



Super Bowl host cities/ regions. 2013. Retrieved March 18, 2014 from: <http://www.everything-dallascowboys.com/nfl-history/miscellaneous/postseason/super-bowl-locations>

Hosting a Super Bowl event can be of great financial interest for the host cities and stakeholders nationwide. The following are estimates of the overall revenue for the 2013 Super Bowl, which took place in New Orleans, Louisiana. Just in tickets sales, the estimate was \$73 million in 2013. Advertising for a 30 second commercial during the game was anywhere from \$3.7 million and \$3.8 million (Schein, 2013). In 2013, CBS paid \$622 million for the rights of the 2012-2013 NFL season and had estimate revenue of \$263 million on Super Bowl ads (Schein 2013). The fast food industry estimated that in 2012 four million pizzas were sold on Super Bowl Sunday. An estimation of 50 million cases of beer was consumed for the 2013 Super Bowl (Schein 2013). Gambling in Nevada was expected to handle over \$90 million in bets related to the Super Bowl (Schein 2013). Hotels, restaurants and nightclubs were anticipated to generate around \$423 million to the city of New Orleans, Louisiana (Schein 2013).

These numbers provide evidence to the nature of this is event. It is one of the largest events in the United States, and definitely the most watched. The city that wins in the bidding process to host the event becomes an attraction to many tourists and football fans. A sudden influx in people is expected for the weekend of the Super Bowl event at the host city. Along with the arrival of these individuals comes an expected rise in revenue for the city and potential crime according to the routine activity theory.

Routine Activity Theory

The routine activity theory has been identified as the theoretical background for this research project for the reason that it is an opportunity-based theory and because of its three key components. The routine activity theory operates under the idea that the following three elements must co-occur before a crime can proceed: “the presence of a motivated offender, the presence of a suitable target, and the absence of a capable guardian” (Breetzke & Cohn 2013, 389). The theory additionally advises that there is an increased possibility that the three elements of the theory will co-occur when an individual is not engaged in a routine activity (Breetzke & Cohn 2013, 389). When individuals travel for sporting events, this automatically breaks their daily routine; they are no longer living the day-to-day activities that they are familiar with and accustomed too. Rather, they are outside of their norm, which could potentially single them out. Individuals leaving their daily life patterns can provide an opportunity for the three components of the routine activity theory to enact by motivating offenders to engage in an act of crime (Miller, 2012, p.390). In a study done on the 2010 Winter Olympics Games on crime in Vancouver, Andersen and Tong (2012, 334) found through previous research that because of unfamiliarity with the area or differences in dress (such as tourist

clothing and cameras), visitors will be vulnerable to criminal victimization (as cited in George, 2003, 2010; Lepp and Gibson 2003; Ryan 1993).

Individuals traveling to be a part of a major sporting event increase the chances of the routine activity components to be present. This is predominantly true for tourists however; this does not mean that the local population is not subjected to crime victimization. Sporting events could be the cause of an increase in crime for various reasons.

Crime and Sporting Events

The relationship between a sporting event and crime has been correlated with the increase in a number of crimes (Breetzke & Cohn 2013). According to the routine activities theory, individuals' routine activities have a tendency to be stable; their stability can easily be disrupted by the arrival of big events, such as sporting related events. This disrupted change could increase the likelihood for crime and victimization. Breetzke and Cohn (2013) argue that sporting events could encourage or force changes in a person's normal routine and that due to the large number of spectators that arrive, there is an increase in the number of suitable targets. Just like there is forced change in the city's resident's routine activities, the event spectators and tourists utilize this opportunity to purposely escape from their daily routines (Kim and Byon 2013, 1363).

Sporting events such as the FIFA World Cup and the Olympics will draw many spectators to the hosting city. The 2006 FIFA World Cup attracted around five million international visitors to Berlin, Germany; the 2010 World Cup in South Africa had around 3.18 million individuals in attendance (Finley 2013, 229-230). Studies have shown the connection between sports and crimes.

There are many kinds of crimes that can be committed during a sporting event whether it is directly related to the event or not. Data gathered pertaining to certain crimes is contingent on the jurisdiction and the agency that is collecting this data. Each crime will be defined later in chapter 3.

Homicide/ Murder

Homicide is a crime that is not as frequently committed as other crimes because of the nature of its action. Not much research has been done on the relation between homicides and sporting events. However, a study compared the successes and failures of professional sports in 30 United States Metropolitan areas with the foundation of Gabennesch's theory of broken promises (Fernquist 2000). Fernquist (2000, 337) concluded that "... Gabennesch's theory of broken promises is tied to suicide rates, homicide rates, and the performance of professional sports team..." One explanation to this finding is that the attitude and strong feelings that the fans are influenced by is related to their team's performance (Fernquist 2000, 337-338). Another study by White (1989, 431) also concluded that professional football playoff games increased the incidences of violence as indicated by the number of homicides that occurred during the 6 day period after the playoffs. White also found that homicides increased significantly for losing teams in standard metropolitan statistical areas (1989, 432).

Rape

Rape is crime that is categorized under violent crimes. There has not been much research performed directly related to rape and a sporting event. Buamann et al. (2012) found a statistical significant decrease in overall violent crime in relation to Super Bowl

location. Rape is also a crime that is very under-reported. It can also take place in certain situations where it can go unnoticed.

Human and sex trafficking

Human trafficking is a crime that has recently begun to raise much awareness and has more attention drawn to it. This is a crime that is difficult to track and report data for given the nature of the crime. Many times the victim may be the one held accountable for the crime, such as a prostitution charge. In Flowers' (2006) chapter on human trafficking, it is noted that female victims will be trafficked by their pimps to a location that is in demand for prostitution services. For the Athens Olympic Games there was a prediction that approximately 20,000 women would be trafficked to the city (Finley 2013, 237). For the 2006 FIFA World Cup in Germany, 40,000 women were estimated to be trafficked into the country to accommodate fans in attendance (Morrow 2008, 243). Some evidence has been connected to potential trafficking. The Angel Coalition Trafficking Victims in Russia received over 500 phone calls pertaining to several offers to travel to Germany for the World Cup to work as models, cooks, waitresses, hostesses and cleaning personnel (Finley 2013, 237-238). The German government later cited an increase in prostitution after the games (Finley 2013, 238). The American National Football League's 2013 Super Bowl event was also expected to attract thousands of fans to New Orleans, Louisiana as well as a "less acknowledged population... victims of human trafficking forced into prostitution" (Sexual Slavery, 2013, 6). Human trafficking is a less acknowledged and higher suspected crime to increase during sporting events. "The United States is a "major destination country' for human trafficking; over 50,000 women and children are brought here each year for sex trafficking"" (Nelson, 2012, 845).

Robbery

The fact that there are more suitable and potential targets in the location of the host city could potentially increase the opportunity for robbery to take place. When individuals travel they tend to carry with them certain things of value such as cameras, and phones. A study by Lin (2007) compared the robbery rates for certain American professional football teams on game days and non-game days in four different zones. Lin (2007, 39) found that in only one of the four zones there were more robberies on game days. However, the results were not statistically significant (p. 39). Campaniello (2011, 149) recognizes a previous study that “identifies a relationship between the hosting of these events and an increase in robbery, sexual and common assaults.” Robbery is also a crime that falls under violent crimes because of the nature of its action. Therefore, it is interesting to see the findings from Baumann et al. (2012), where violent crime decreased significantly when compared to the Super Bowl location.

Assault

Assault is perhaps a more common crime. There are many factors that can contribute to committing an assault related crime and different kinds of assault that fall under the “assault” umbrella. Alcohol has been a factor identified in several studies. A relationship has also been established between sporting events and alcohol consumption (Miller et al., 2012, p.31). “National sporting events draw large numbers of people... supporters of both teams take part in heavy binge drinking, which will in turn increase the risk of violence” (Miller, et al. 2012, 32). Assault related offenses also have a tendency to increase with major sporting events. One study found that individuals are more likely to be admitted to a hospital emergency room when the local team won, as the result of an

assault (Miller et al. 2012, 34). Many times these assaults can be related to the alcohol consumption. “Exploration of the role of alcohol in a group of South Australian football fans found that alcohol was central to their football experience” (Lloyd et al. 2012, 702).

Another study which evaluated the impact of the 2010 Winter Olympic Games on Vancouver’s crime found that the only statistical significant results that came of the analyses was for assault (Andersen and Tong 2012, 352). Baumann et al. (2012, 86) also found literature supporting Andersen and Tong’s findings; “arrests for assaults, disorderly conduct and domestic violence rise during (and after) football games.” A 2009 study by Rees and Schnepel on College football games also found a 9 percent increase in reported assaults associated with home games. These findings provide insight to act of an assault in relation to sporting events. Alcohol consumption is present at most sporting events and has been correlated to some of the findings. Crimes against persons are all unfortunate. However, crimes against property could be rather troublesome as well.

Burglary

Burglary is a more susceptible crime when it comes to sporting events because of the increase in tourism and available targets. Campaniello’s (2011) investigation on the causal relation between crime rates and hosting the 1990 Football World Cup found that there was a significant increase to most crimes against property. These property crimes included pick-pocketing, bag-snatching, shoplifting, and burglary (Campaniello 2011, 157). Lin’s (2007) study on the impact of professional football games on crime also found that the average difference in burglaries between game days and non-game days also increased.

Some studies have found burglary not to be significant in relation to a sporting event. Breetzke and Cohn found no significant relationship between burglary and game days in their study for crimes in South Africa and its patterns with sporting events (2013, 403). Baumann et al. (2012) study in the United States on sports and crime rates also found no effect on property crime rates which burglary falls under.

Larceny

Most of the literature found pertaining to larceny or theft is more associated with the individuals who are traveling into the host city for the event. The rates on burglary and motor vehicle theft would not really apply to visitors. As Andersen and Tong (2012, 356) mention, “these visitors do not bring their homes or automobiles with them... and are themselves not suitable targets for these crimes.” However, larceny is a common crime that tourists are more susceptible to. Tourists are more vulnerable to this crime because of the high-visibility of personal belongings that they carry with them (Andersen and Tong 2012, 356). Camapniello’s (2011, 157) study on the 1990 Football World Cup also found a significant increase in crimes such as shoplifting, bag-snatching and pick-pocketing. These findings do not imply that the direct cause of this significant increase in crimes is directly related to the tourists at the host location, however; it is an observation to consider.

Motor Vehicle Theft

As mentioned above in regards to larceny, tourists do not bring their homes or vehicle (most of the time) when traveling to a location for an event. Though tourists appear to be a central focus in the literature when studying crime, we must not forget about residents of the area and how they too can be affected. Previously it was mentioned

how situations such as being caught in traffic and places being crowded are some of the situation the locals have to handle. These are uncomfortable situation to be in the middle of, however; there are others that are significantly worse. The local residents of the host city who chose to attend the sporting event or those tourists who drove in are prone to motor vehicle theft. Breetzke and Cohn (2013, 391) state that “motor vehicles parked in the vicinity of the stadium or elsewhere are unguarded and more vulnerable to crimes such as motor vehicle theft or theft from vehicle.” Stadiums are typically prepared with security at such locations and Breetzke and Cohn recognize this fact. However, they do bring up a good point that these capable guardians, as referenced in the routine activity theory, have a diminishing influence as the distance from the stadium increases. Lin (2007) had significant findings in his study when assessing auto theft in several zones. He was comparing game days to non-game days and obtained results that were found to be significant on game days.

Conclusion

On the whole, major sporting events are social gatherings that bring thousands of individuals to one location. A gathering of this sort could be a delightful experience in most occasions. There will, however, be those few instances in which a great experience can turn into a bad one. Per the literature, a sudden rise in people will increase the opportunity for crime to occur. Through the routine activity theory, one can conclude that there is anticipation for some crimes to spike up because of the lack of routine and capable guardians. Measures can be taken into action to help avoid crime from occurring. As in the 2006 Football World Cup, there was organized security forces formed with a

sub-committee dealing with policing and crime specifically (Jennings and Lodge 2011, 214).

The literature has addressed crime in relation to sporting events; most of which have been international. Very few studies have addressed crime and sporting events' relation within the United States. One study that was found, analyzed game days versus non-game days in relation to crime and professional football in the United States. However, not all cities that have a football team were explored. Another study looked into the crime rates for metropolitan cities with professional teams some of which included NFL teams and some Super Bowl locations.

As Billings and Depken II (2012, 176) mentioned in their study "...sporting and cultural events are an obvious temptation to would-be criminal. Event attendees are concentrated in a relatively small geographic area, carry considerable sums of cash and expensive accessories." No study specifically designed to evaluate the impact of hosting the NFL's Super Bowl event on the local crime rates was identified. Given that it is the most popular event in the United States and the most viewed, it is important to consider all matter that could assist in the enhancement of public safety when hosting a Super Bowl event.

Hypotheses

Per literature findings on sporting events and crime, and the history and popularity of the NFL's Super Bowl event the following hypotheses have been developed:

- H1: The NFL's Super Bowl event will cause a significant increase on the murder rate of the host city.
- H2: The NFL's Super Bowl event will cause a significant increase on the rape rate of the host city.
- H3: The NFL's Super Bowl event will cause a significant increase on the robbery rate of the host city.
- H4: The NFL's Super Bowl event will cause a significant increase on the aggravated assault rate of the host city.
- H5: The NFL's Super Bowl event will cause a significant increase on the simple assault rate of the host city.
- H6: The NFL's Super Bowl event will cause a significant increase on the burglary rate of the host city.
- H7: The NFL's Super Bowl event will cause a significant increase on the larceny rate of the host city.
- H8: The NFL's Super Bowl event will cause a significant increase on the motor vehicle theft rate of the host city.

Research Purpose

The purpose of this explanatory research is to evaluate the impact of hosting the National Football League's Super Bowl event on the local crime rates of the host city. This study will seek to assess the local crime rates before and after the influence of the Super Bowl event of hosting cities from 1980 to 2013.

Conceptual Framework¹

Table 2.1 Linking the Hypotheses to the literature.

Formal Hypotheses	Sources
H1: The NFL's Super Bowl event will cause a significant increase on the murder rate of the host city.	Fernquist, 2000; White, 1989
H2: The NFL's Super Bowl event will cause a significant increase on the rape rate of the host city.	Finley, 2013; Miller, et. al, 2013
H3: The NFL's Super Bowl event will cause a significant increase on the robbery rate of the host city.	Andersen & Tong, 2012; Baumann et. al, 2012; Breetzke & Cohn, 2013; Lin, 2007
H4: The NFL's Super Bowl event will cause a significant increase on the aggravated assault rate of the host city.	Andersen & Tong, 2012; Baumann et. al, 2012; Breetzke & Cohn, 2013; Campaniello, 2011; Lloyd, et al., 2012; Miller, et. al, 2013; Rees and Schnepel, 2009
H5: The NFL's Super Bowl event will cause a significant increase on the aggravated assault rate of the host city.	Andersen & Tong, 2012; Baumann et. al, 2012; Breetzke & Cohn, 2013; Campaniello, 2011; Lloyd, et al., 2012; Miller, et. al, 2013; Rees and Schnepel, 2009
H6: The NFL's Super Bowl event will cause a significant increase on the burglary rate of the host city.	Baumann et. al, 2012; Breetzke & Cohn, 2013; Campaniello, 2011; Lin, 2007
H7: The NFL's Super Bowl event will cause a significant increase on the larceny rate of the host city.	Andersen & Tong, 2012; Baumann et. al, 2012; Campaniello, 2011;
H8: The NFL's Super Bowl event will cause a significant increase on the motor vehicle theft rate of the host city.	Breetzke & Cohn, 2013; Lin, 2007;

The conceptual framework table is organized by the eight hypotheses that will be tested in this research per its corresponding literature on the second column of the table.

All variables will exclude offenses that were unfounded, i.e., false or baseless complaints.

¹ For more information on conceptual frameworks see Shields and Rangarajan, 2013; Shields and Tajalli, 2006; Shields, 1998.

Chapter Summary

This chapter reviewed the scholarly literature that addressed the relationships between crimes and major sporting events. History on sporting events was provided. The routine activity theory was defined and identified as this research's theoretical foundation. A brief description and history of the United States' NFL Super Bowl event was provided along with its overall culture. Eight types of crime were introduced and assessed based on their supporting literature. Per the literature and history, a conceptual framework was developed with 8 hypotheses and a research purpose was introduced.

Chapter 3 - Methodology

Chapter Purpose

This chapter will address the methods that have been utilized to test the hypotheses of this research study. The chapter will additionally describe the data collection process, and the selection and operationalization of the variables. The unit of measurement will be presented and described. The crimes have been measured by rates given the numerous cities that will be studied. The statistical analysis chosen to execute the testing of this study will be explained as well as why this specific test was the appropriate measure to test the hypotheses.

Operationalization

The theoretical foundation that assumes that crime increases with the presence of a large sporting event is nothing but a concept. In order to test such a theory, crime must be interpreted through a measurable variable and the presence and timing of a specific sporting event must be identified as well. With the actual numbers of crime, and the presence and timing of a specific sporting event, one can perform the appropriate statistical analyses to test the theory.

The selected measurable variables for this research study are crime rates and the time before and after the presence of the NFL's Super Bowl event in the host city. The dependent variables in the study consist of eight different crimes. Therefore, data was gathered in order to perform the appropriate statistical analysis to test the hypotheses. Reported numbers for actual crimes of the 8 dependent variables was gathered from the United States' Federal Bureau of Investigation's (FBI) Uniform Crime Reports. Kevin

Bailey also wrote an applied research project with Texas State University in which an interrupted time series was utilized with several different crimes as his dependent variables.

Given the fact that there are multiple cities that are analyzed in the study, the monthly crimes reported were converted into monthly crime rates. The monthly crime rates were calculated utilizing the city's population for that month and the number of crimes reported for each crime analyzed. The product of these two numbers provided us with the monthly crimes per 100,000 individuals. The hypotheses and operationalization table are listed below.

Hypotheses

Per literature findings on sporting events and crime, and the history and popularity of the NFL's Super Bowl event the following hypotheses have been developed:

- H1: The NFL's Super Bowl event will cause a significant increase on the murder rate of the host city.
- H2: The NFL's Super Bowl event will cause a significant increase on the force rape rate of the host city.
- H3: The NFL's Super Bowl event will cause a significant increase on the robbery rate of the host city.
- H4: The NFL's Super Bowl event will cause a significant increase on the aggravated assault rate of the host city.
- H5: The NFL's Super Bowl event will cause a significant increase on the simple assault rate of the host city.
- H6: The NFL's Super Bowl event will cause a significant increase on the burglary rate of the host city.
- H7: The NFL's Super Bowl event will cause a significant increase on the larceny rate of the host city.
- H8: The NFL's Super Bowl event will cause a significant increase on the motor vehicle theft rate of the host city.

Design

A pooled cross-sectional interrupted time series analysis will be used to test the hypotheses of this research. Interrupted time series analysis compares the trends of crime rates before and after the Super Bowl event. This method is also “generally strong in controlling for history and regression to the mean (Johnson, 2010).” Brion Oaks, also utilized this type of method analysis in his applied research project because it allowed him to evaluate the obesity rate in Maine before and after snack taxes were implemented.

In other words, interrupted time series examines the impact of a program, which in this case is the Super Bowl event. The variables that will be repeatedly measured over time are our crime rates both before and after the program has gone into effect. Because of the pooled cross-sectional data, all cities will be combined so that the Super Bowl event can be analyzed as a whole rather than its effect by individual city. A visual depiction of this study is presented below.

$O_1 O_2 O_3 O_3 O_4 O_5 O_6 O_7 \dots O_{12}$ SB $O_{t+1} O_{t+2} O_{t+3} O_{t+4} O_{t+5} O_{t+6} O_{t+7} \dots O_{t+12}$

Operationalization Table

The operationalization table presents both the dependent and independent variables. The dependent variables are the actual monthly rates of each crime occurring in the host cities. The independent variables consist of four manually created variables.

Table 3.1 Operationalization Table

Variables	Measurement	Data Source
Dependent		
Crime Rates <ul style="list-style-type: none"> • Murder • Force Rape • Robbery • Aggravated Assault • Simple Assault • Burglary • Larceny • Motor Vehicle Theft 	Monthly crime rate per 100,000 residents for each of the crimes.	Federal Bureau of Investigations' Uniform Crime Reports' 'Return A Record' cards
Independent		
<ul style="list-style-type: none"> • Trend before SB 	A coefficient from 1 to 24 for each city.	Manually coded.
<ul style="list-style-type: none"> • Level Change 	A dummy variable where 0= before the Super Bowl and 1= after the Super Bowl for each city.	Manually coded.
<ul style="list-style-type: none"> • Trend after the SB 	A variable coded zero for all months before the Super Bowl and a counter from 1 to 12 for all months after the Super Bowl, for each city.	Manually coded.
<ul style="list-style-type: none"> • Super Bowl 	A dummy variable where 1= the month of the Super Bowl and 0= all other 23 months for each city.	Manually coded.
<ul style="list-style-type: none"> • Unemployment Rate 	Monthly unemployment rate for each state of the host city.	Department of Bureau and Labor Statistics

Data Collection

The data collected for this research came from the FBI's Uniform Crime Reports. Data collected for the Uniform Crime Report (UCR) comes in various ways and is sorted in multiple modes. The FBI collects monthly crime data from reporting jurisdictions across the nation through a "Return A Record Card." This card is filled out by local jurisdictions with the monthly number of actual offenses and sent to the FBI. The FBI then compiles this data and provides annual reports through their website (FBI 2014). The FBI is the best available source for gathering data that is needed to test the hypotheses of this research. The precision with which the FBI collects this data will provide an accurate number for the 8 criminal offences that will be evaluated in this research. It will be noted that though the UCR is the best available source of data for this research, the numbers of rapes reported are not completely accurate. Historically, rape is a crime that is under reported for several reasons. Victims may abstain from reporting an attack because of stigma, shame and the fear of disclosure to acquaintances (Palermo and Peterman 2011, 924). We should also take into account that most of the data collected for sexual violence related crimes are predominantly from adult women, regardless of suggested evidence that children (boys and girls) and men are also victims of these crimes (Palermo and Peterman 2011, 924). A lack of reporting could also come from the law enforcement agencies themselves. "...America is in a crisis of sexual violence that has gone undetected because police departments across the country systematically underreport rape" (Yung 2014, 1204). Yung also indicates in his study that for the crime of rape, approximately 84% of incidents in recent years, have not been reported to police (2014, 1206).

An additional variable was used as a control variable for the analysis. There is an extensive body of literature that has focused on the relationship between crime and unemployment. Fallahi et al., found that the unemployment rate had a significant effect on burglary and motor vehicle theft (2012). The unemployment rates for the state of the host city was gathered and controlled for. This data was collected from the Bureau of Labor Statistics. The Bureau of Labor Statistics reports this data on a monthly basis by state (Bureau of labor Statistics 2014). Each crime was analyzed by the monthly crime rate per 100,000 residents for each city.

Description of Dependent Variables

The following 8 crimes were selected for this research study because of the FBI's consistent reporting and collection of the data. These crimes are: murder, force rape, robbery, aggravated assault, simple assault, burglary, larceny and motor vehicle theft. Each of these dependent variables will be described below per the FBI's Uniform Crime report (UCR) handbook definitions and categories.

Murder: The variable Murder accounts for the actual numbers of criminal homicide that are reported. By definition, Criminal Homicide is "the willful (non-negligent) killing of one human being by another" (UCR 15, 2004). The following are not classified as Criminal Homicide: suicides, fetal deaths, traffic fatalities, accidental deaths, assaults to murder and attempts to murder.

Force Rape: The variable Force Rape accounts for the number of actual forcible rapes that are reported. By definition, Forcible Rape is “the carnal knowledge of a female forcibly and against her will (UCR 19, 2004). The following should be taken into consideration when viewing this variable, “by definition, sexual attacks on males are excluded from the rape category and must be classified as assaults or other sex offenses depending on the nature of the crime and the extent of the injury” (UCR 20, 2004).

Robbery: The variable Robbery accounts for the number of actual robberies reported. By definition, Robbery is “the taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or threat of force or violence and/or by putting the victim in fear” (UCR 21, 2004).

Aggravated Assault: The variable Aggravated Assault accounts for the number of actual aggravated assaults reported. By definition, Aggravated Assault is “an unlawful attack by one person for the purpose of inflicting severe or aggravated bodily injury. This type of assault usually is accompanied by the use of a weapon or by means likely to produce death or great bodily harm” (UCR 23, 2004).

Simple Assault: The variable Simple Assault falls under the Assault category of the UCR handbook and is listed under the category of Other Assaults-Simple, Not Aggravated (UCR 24, 2004). This category includes “all assaults which do not involve the use of firearm, knife, cutting instrument, or other dangerous weapon and in which the victim did not sustain serious or aggravated injuries” (UCR 25, 2004).

Burglary: The variable Burglary will account for the actual burglaries reported. By definition, burglary is “the unlawful entry of a structure to commit a felony or a theft” (UCR 28, 2004).

Larceny: The variable Larceny will account for the actual larceny/thefts reported. By definition, larceny-theft is “the unlawful taking, carrying, leading, or riding way of property from the possession or constructive possession of another” (UCR 31, 2004).

Motor Vehicle Theft: The variable Motor Vehicle Theft will account for the actual motor vehicle thefts that are reported. By definition, motor vehicle theft is “the theft or attempted theft of a motor vehicle” (UCR 35, 2004). This includes autos, trucks, buses and other vehicles.

Description of Independent Variables

Trend before the Super Bowl: A counter coded 1 through 24 for each city. The coefficient of this variable will represent the trend in the crime rate before the Super Bowl event took place.

Level Change: This is a dummy variable coded zero for the 12 months before the Super Bowl event and 1 for the months of the Super Bowl and the following 11 months after. The coefficient of this variable will indicate whether there has been a change in the level of crime rates after the Super Bowl event.

Months After – Months Before

Trend After the Super Bowl: This variable is coded zero for the 12 months prior to the Super Bowl event and counter for the month of the Super Bowl and following 11 months for each city.

Super Bowl: This is a dummy variable coded 1 for the month of the Super Bowl and zero for all other 23 months for each city. The coefficient of this variable will indicate presence or absence of a spike in the crime rate on the month of the Super Bowl.

Unemployment Rate: The monthly unemployment rate for the state of each city was used for this control variable.

Cities in the Study

Some cities that hosted the Super Bowl did not report crime data to the FBI, or reported the data by quarter or bi-yearly. Since the analysis for this research required monthly data, these cities were excluded from the study. It should be noted that all 8 crime rates collected were for all of the cities mentioned below except for Tampa, Florida. Because of the reporting methodology that Tampa utilized for Simple Assault, this city was excluded from the analysis for this crime. All other 7 crimes were analyzed for Tampa, Florida.

Table 3.2: List of the Super Bowl host cities in this study

Super Bowl	Year	Host City
XXIV	1990	New Orleans, LA
XXV	1991	Tampa, FL
XXVII	1993	Pasadena, CA
XXVIII	1994	Atlanta, GA
XXX	1996	Tempe, AZ
XXXI	1997	New Orleans, LA
XXXII	1998	San Diego, CA
XXXIV	2000	Atlanta, GA
XXXVI	2002	New Orleans, LA
XXXVII	2003	San Diego, CA
XXXVIII	2004	Houston, TX
XL	2006	Detroit, MI
XLII	2008	Glendale, AZ
XLV	2011	Arlington, TX
XLVI	2012	Indianapolis, IN

Chapter Summary

This chapter discussed the selection of the variables and design chosen for this study. The operationalization table was presented and the measurement for each variable was explained. The statistics chosen for this study were described and explained as well as the selected host cities, and the reasons why a few cities were omitted from the analysis.

Chapter 4 - Results

Chapter Purpose

The purpose of this chapter is to discuss the results of the regression analysis for the interrupted time series. Findings will be reviewed and interpreted. The results examined in this chapter will determine whether the Super Bowl event leads to high crime rates in the host city. The table below presents the findings of the analysis.

Table 4.1: Results

	Murder	Force Rape	Robbery	Agg. Assault	S. Assault	Burglary	Larceny	Motor V. T.
Trend Before SB Level Change	0.025	-.032	0.683	-0.994	-2.025	1.491	-.616	-.398
Trend After SB Super Bowl Unemp. Rate	-0.336	.408	-9.361	10.142	15.563	-12.382	3.824	-5.351
	0.013	-.029	-0.443	-.121	.313	-1.619	-.866	.310
	-0.093	-.522	3.647	-14.717	-19.409	-4.894	-7.685	-.003
	-							
	0.283**	-.201*	-4.139**	-6.119**	-11.574**	-2.198	-33.794**	-12.940**
Constant	3.772**	6.250**	76.629**	123.159**	205.338**	153.275**	576.667**	211.360**
R ²	0.055	.017	0.038	.033	.083	.005	.115	.120
F	4.134**	1.182	2.799*	2.432*	5.918**	.371	9.182**	9.625**

* significant at $\alpha < .05$

** significant at $\alpha < .01$

Explanation

The main variables of focus were “Super Bowl” and “Trend After the SB.” Neither one of these variables, for any crime, resulted in statistically significant results. These findings explain that this major event has no impact on the crime rates of the host city. There was no significant change in the regression slope for either variable when controlling for the unemployment rate. The coefficient “Super Bowl” would have shown us if there was a spike in crime for the month the event was hosted. The coefficient “Trend After the SB” would show if there was a rise in crime after the Super Bowl was hosted.

There were also no significant findings on the “Trend Before SB” independent variable; indicating that there was no trend on the monthly crime rate before the hosting of the Super Bowl. This coefficient would have shown if there was a trend in crime rates in the cities before the event was hosted.

The Durbin Watson test demonstrated the presence of a positive autocorrelation. The presence of an autocorrelation unrealistically increases the possibility of finding significant results. Because the coefficient of interest in our analysis was not significant, and because the correction for autocorrelation would not have made a difference, our regression models were not corrected for autocorrelation.

The findings do not support any of the hypotheses of this study. In other words, the Super Bowl event does not have a significant impact on the crime rates of the host city.

Chapter Summary

This chapter presents the results for the regression analysis done for this study. The coefficients of interest were explained. The Durbin Watson test and autocorrelation correction was explained. Overall findings were presented in this chapter.

Chapter 5 - Conclusion

Chapter Purpose

This chapter will seek to explain the purpose of this research as well as the literature. The analysis and findings will be summarized and limitations to this study will be explained. Suggestions for further research will be discussed as well as the theories behind the findings of this study.

Research Purpose and Explanation

The purpose of this research was to evaluate the impact of the National Football League's Super Bowl event on the crime rates of the host city. This research focused on the Super Bowl event in its entirety; which was the reason a pooled cross-sectional interrupted time series design was utilized. This allowed us to see the impact of the Super Bowl from a general perspective.

A limitation to this study was the methodology utilized by some of the host cities to report crime data to the FBI. Because of the reporting methods, some cities were excluded from the analysis.

The host city begins to prepare for the event with plenty of anticipation; many stakeholders come into play when organizing this event. Fans will also prepare to travel to the host city to enjoy the NFL finals. This provokes a sudden increase in the population, which calls for further public safety. The safety of both the locals and the tourists should be of the utmost importance. No literature pertaining to the Super Bowl event as a whole and local crime rates of the host cities was identified. The hope of this study is to contribute to the sporting events and public safety literature when looking at

the Super Bowl event. The Super Bowl is the most viewed television show in the United States; further research of its impact should be analyzed given its popularity in this country.

One suggestion for further research on the Super Bowl event and crime is looking at 12 more months before the event takes place; 24 months before and 12 months after. Also, looking at the month of the Super Bowl only, three years before and two years after; if the Super Bowl took place February 2005, looking at the crime rates for February 2002, 2003, 2004, 2006 and 2007 to see if there has been a change in trend for this month. Analyzing individual cities would allow some detailed insight on how the Super Bowl affected (if at all) the local crime rates of one specific city.

Mapping out the reported crimes by geographical location of the city would also provide a different perspective on the crime rates of the city. Crime can be tracked by an 8 mile diameter around the stadium, 12 mile diameter, 20 mile diameter and until the end of the city limits.

The number of hospital intakes pertaining to assault related injuries on the day of the Super Bowl can be analyzed, as well as intakes related to excessive alcohol consumption.

One explanation behind the findings of this study is that because it is such a family-oriented event, spectators are not presumed to be engaging in illegal activities during the event. Whether you are watching the game in the stadium, at home, or in a social setting, most focus is geared toward the game and is watched in company of family and/or friends.

The Super Bowl is also a one-day event, unlike the Olympics, World Cup or Formula One Racing events, which last longer than one day. The Super Bowl is also a local event to the United States. It is not a World Wide type of sporting event, so there is little to no international travel to the city hosting the event.

The Super Bowl is also a costly event to attend. CBS Sports reported that the average cost for the Super Bowl XLVIII (2014) ticket was \$2,646 (Breech 2014). The individuals who are in attendance for this event are not likely to engage in criminal activity. However, they could become a target as tourists for larceny and theft. This leads into the next explanation that because most spectators will leave the day following the event, there is no time for reporting stolen property to the local law enforcement officials.

The Super Bowl is planned with plenty of anticipation. This also allows for city officials to prepare for the event and increase vigilance.

In conclusion, the Super Bowl did not have either a positive or negative effect on local crime rates. The lack of a positive effect is a good sign for those who plan to attend in future years, and for cities to continue to approach their preparation methods the way they have. The Super Bowl is an event that brings a lot of revenue, tourism and attention to the host city. All which are good investments for cities on the whole. Keeping the focus on making this a secure family event should be the priority. Americans love their football; let's keep it safe!

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