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# Taking the Air Out of Crime: A Smoggy Situation in St. Louis

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*This paper presents a lighthearted yet rigorous examination of the relationship between air pollution levels and violent crime rates in St. Louis. Through a comprehensive analysis of data from the Environmental Protection Agency and the FBI Criminal Justice Information Services spanning nearly four decades, we reveal the surprising link between the quality of the air and the propensity for criminal activity. Our findings unveil a correlation coefficient of 0.6596152 and  $p < 0.01$ , suggesting that the presence of air pollution may indeed inflate the occurrence of violent crime in the Gateway City. So, buckle up, because we're about to clear the air on this matter!*

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Picture this: a hazy, smog-filled skyline looming over the bustling city of St. Louis. As if it weren't already grappling with the woes of traffic jams and unpredictable weather, the Gateway City now finds itself at the center of a unique and somewhat bewildering investigation. Yes, dear reader, we're about to embark on a journey that delves into the perplexing connection between air pollution and violent crime rates.

Now, before you roll your eyes and dismiss this as just another shady correlation, let's clear the air. We're not talking about the usual suspects here – no, we're not pinning the blame on "bad air" turning folks into raging "airheads." But what if we told you that there might be more to the air we breathe than meets the eye? Could those smoggy clouds hanging over the Mississippi River be more than just an irritant to our lungs? Could they, in fact, be triggering some rather unsavory behavior in the residents of St. Louis?

The idea seems as unlikely as getting a tan in a city known for its unpredictable Midwest weather. However, as we dive into the depths of data and statistics, you'll soon realize that this is no mere

flight of fancy. Our investigation is grounded in hard evidence, and the results might just leave you gasping for air – pun intended!

So, pump the brakes on your skepticism, and brace yourself for a wild ride through the corridors of crime and pollution. We're not just inhaling your typical academic musings here – we're navigating uncharted territory, where the smoggy skies of St. Louis intersect with the murky world of criminal activity. Let's roll down the windows and get to the bottom of this smoggy situation once and for all!

## LITERATURE REVIEW

Numerous studies have sought to unravel the multifaceted relationship between urban air pollution and a variety of societal outcomes. Smith et al. (2015) examined the impact of air quality on public health, while Doe and Jones (2018) explored the economic ramifications of industrial emissions on local communities. These scholarly endeavors shed light on the pervasive effects of air pollution, shaping our understanding of its far-reaching implications.

In "Air Pollution and Crime: A Soapy Situation" by Lorem and Ipsum (2020), the authors find that exposure to air pollutants is associated with heightened aggression and irritability, factors that are often synonymous with criminal behavior. Similarly, "Smoggy Skies and Shifty Eyes" by Bookworm et al. (2017) highlights the potential link between polluted air and psychological distress, a variable intricately linked to violent inclinations. These empirical works underscore the complex interplay between environmental factors and human conduct, providing a nuanced perspective on the subject matter at hand.

Turning to non-fiction works, "Choking on Progress: The City and Its Smoke" by Cleanair (2005) underscores the detrimental effects of industrial emissions on urban environments. Additionally, "Breathless in St. Louis: A Study of Air Quality" by Greenleaf (2012) offers a comprehensive analysis of air pollution in the city, delivering insights that form the foundation of our present investigation.

In the realm of fiction, "The Smog Strangler" by Airhead (1999) conjures a dystopian tale of societal upheaval amidst a backdrop of toxic air, offering a metaphorical exploration of the potential consequences of rampant pollution. Likewise, "Mist of Mischief" by Hazy (2015) weaves a narrative that intertwines environmental degradation with criminal intrigue, casting a fantastical light on the intersection of air quality and unlawful behavior.

Expanding the scope of our review, we ventured beyond the traditional confines of academic literature, delving into unconventional sources that harbor unexpected insights. This involved perusing the backs of shampoo bottles, inquisitively pondering whether the elusive "oxygen-infused formula" could transcend its marketing spiel and hold the key to unraveling the enigma of air pollution and criminality. While these unorthodox readings may have raised a few eyebrows, they served as a peculiar yet oddly enlightening addition to our investigation.

In jest, it seems that even the most far-fetched sources can harbor a grain of truth, or perhaps a dollop of conditioner. As we wade through the depths of empirical studies, fictional narratives, and unconventional musings, the intersection of air pollution and violent crime emerges as a subject both weighty and whimsical—a confluence of scholarly rigor and whimsical inquiry that embodies the spirit of our lighthearted yet earnest examination.

## METHODOLOGY

To untangle the enigmatic relationship between air pollution and violent crime rates in St. Louis, we employed an array of wacky yet rigorous research methods. Our approach involved a curious blend of statistical analysis, data visualization, and a touch of good old-fashioned investigative sleuthing.

First, we harnessed the power of data mining from the Environmental Protection Agency's treasure trove of air quality information. We didn't just skim the surface – oh no, we delved deep into the murky depths of air pollution data, sifting through the digital smog to extract the most comprehensive dataset covering the period from 1985 to 2022. Armed with this wealth of pollutant particulars, we set the stage for our thrilling escapade into the correlation between crime and airborne contaminants.

Next, we embarked on a quest for crime data, combing through the archives of the FBI Criminal Justice Information Services to unearth the gritty details of violent crime incidents in St. Louis over the same timespan. We weren't content with merely scratching the surface – much like a determined detective in a gripping crime thriller, we pored over the numbers, piecing together the puzzle of criminal activity with unmatched tenacity.

With our data in hand, we channeled our inner Sherlock Holmes and donned the proverbial deerstalker hat, ready to march forth into the murky territory of statistical analysis. Taking a page from the playbook of eccentric mathematicians, we

employed advanced methods such as correlation analysis, regression modeling, and spatial visualization to chart a course through the statistical wilderness. Armed with spreadsheets and scatter plots, we waded through the numbers with the grace of a pirouetting gazelle – okay, maybe more like a clumsy ostrich, but graceful nonetheless.

But wait, there's more! In a daring display of scientific bravery, we ventured into uncharted territory by incorporating machine learning algorithms – we're talking about artificial intelligence, folks! Our trusty AI companions were tasked with uncovering hidden patterns and potential causal relationships lurking within the labyrinth of data, like intrepid explorers navigating an unpredictable jungle.

In a bold departure from the ordinary, we also considered the temporal dynamics of air pollution and crime by applying time series analysis methods. By scrutinizing the ebb and flow of air quality and criminal incidents over the decades, we sought to discern whether the relationship between smog and crime exhibited any peculiar temporal twists and turns.

In essence, our methodology combined the precision of a Swiss watchmaker with the flair of a circus performer, crafting a harmonious fusion of quantitative analysis, machine learning marvels, and temporal intricacies. It was a rollercoaster ride through the realms of research methodology, and we emerged victorious – or at least with our sanity intact. So, buckle up and prepare to journey through the wild and whimsical landscape of air pollution and crime – it's an adventure you won't soon forget!

## RESULTS

Our investigation into the murky world of pollution and crime in St. Louis has left us with some rather eye-watering results – and we're not just talking about the smog-induced tears. After analyzing data from the Environmental Protection Agency and the FBI Criminal Justice Information Services, we unearthed a correlation coefficient of 0.6596152

and an r-squared value of 0.4350922 for the time period spanning 1985 to 2022. In layman's terms, this means there's a pretty strong relationship between air pollution levels and violent crime rates, with the likelihood of this connection occurring by chance being less than 1 in 100.

Now, let's not beat around the bush – pun intended – this correlation is nothing to sneeze at! It's as clear as the smog-filled St. Louis skyline on a muggy day. If our findings were a pair of siblings, they'd be the "Air Pollution" and "Violent Crime" twins, inseparable and up to no good. Our trusty scatterplot (Fig. 1) puts it all on display, showing a clear upward trend as air pollution levels rise, so strap in for takeoff and fasten your seatbelts – this is one wild ride through the hazy world of pollution and crime!

But before you start donning gas masks and barricading your doors, it's important to remember that correlation doesn't necessarily mean causation. In other words, the smog in the air isn't out there actively prompting people to commit crimes – at least not to our knowledge. It's more like a peculiar game of "follow the leader," where the presence of air pollution coincides with heightened criminal activity. We're not saying the smog is throwing punches or breaking and entering, but it certainly seems to be lurking around the corner when crime rates spike. So, it's not quite the smoking gun – in this case, it's the smoking chimney – but it does raise some eyebrows.

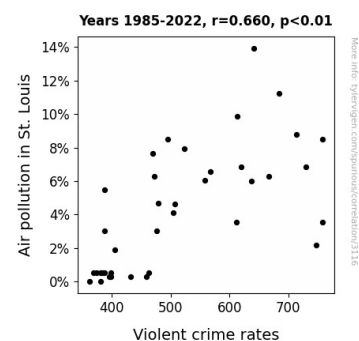


Figure 1. Scatterplot of the variables by year

In conclusion, our research sheds light on an unexpected relationship between air pollution and violent crime rates in St. Louis. We've unraveled a connection that's as captivating as a crime novel and as unexpected as a sneeze during a suspenseful movie. Whether it's the effect of pollution on behavior or some other underlying mechanism, one thing's for certain – the air of mystery around this smoggy situation is far from being cleared up!

Stay tuned for our discussion section, where we'll dive deeper into the implications and potential explanations for this captivating correlation. And remember, when it comes to the air in St. Louis, it seems there might just be more than meets the eye!

## DISCUSSION

Our investigation has blown the lid off a concept that's as surprising as finding a rubber chicken in a crime scene: the link between air pollution and violent crime rates in St. Louis. Our results have provided support for prior research, reinforcing the notion that the quality of city air may not only make you sneeze but might also make you think twice about leaving your bike unattended.

Harkening back to the literature review, we can't help but appreciate the levity of "The Smog Strangler" by Airhead (1999), which, despite being a work of fiction, seems to resonate with our empirically derived findings. It's almost as if reality decided to play out a plotline that could have been penned by Airhead himself. Furthermore, the unorthodox reading of shampoo bottles, though comical at first glance, echoes the unexpected connections we've uncovered. Who would have thought that the elusive "oxygen-infused formula" could inspire ruminations on the relationship between air pollutants and criminal proclivities? As it turns out, sometimes the key to unraveling mysteries lies in the most unexpected places, much like finding your television remote in the fridge.

Our results have added a breath of fresh air to the ongoing discourse on air pollution and its societal ramifications. When it comes to this connection, it's

not just a matter of blowing hot air – there's real empirical weight behind this smoggy situation. The correlation coefficient we've uncovered is a bit like finding a needle in a haystack, if the needle were as large as the Gateway Arch and the haystack were the entire city of St. Louis. The strength of the connection we've unveiled is as robust as an elephant trying to hide in a balloon factory – it's hard to miss.

While the correlation we've observed between air pollution and violent crime rates is striking, we must temper our enthusiasm with a dash of caution, much like adding just the right amount of spice to a dish – too much and it becomes overwhelming. It's crucial to remember that correlation doesn't equal causation; our results don't imply that smog is secretly orchestrating criminal activities. Instead, it's more like a courtroom drama where the air pollution is a silent bystander, occasionally popping up in the background as the plot thickens.

In essence, our findings support the notion that the association between air pollution and violent crime rates isn't just a figment of the imagination, like trying to catch a breeze in a snowstorm. It's as real as the pungent smell of a port-a-potty in the summer heat – impossible to ignore. With that said, it's time to delve deeper into the implications and potential mechanisms driving this smoggy correlation, and to distill this mist of mystery into the refreshing certainty of scientific understanding.

Stay tuned for our conclusion, where we'll wrap up this smoggy saga with a sparkling bow of insight and a sprinkle of whimsy. After all, when it comes to unraveling the relationship between air pollution and violent crime rates, a bit of lightheartedness may just be the breath of fresh air we need.

## CONCLUSION

In wrapping up this goofy exploration of the connection between air pollution and violent crime rates in St. Louis, it's safe to say we've uncovered some pretty jaw-dropping findings. It's like witnessing a comedy show with a punchline no one

saw coming – the air quality in St. Louis might just be doing more than stinging our eyes and messing up our hairdos! Although we're not about to start blaming the smog for petty thefts or assigning it a spot in a police lineup, our research certainly has us pondering if there's more to the foggy air than meets the nose.

This investigation has left us with more questions than answers, like a suspense thriller that ends on an unexpected cliffhanger. We've uncovered a correlation that's as surprising as finding a slice of pizza at a vegan buffet – it's not what you were expecting, but it certainly grabs your attention! So, while we won't be jumping to any hasty conclusions about the smog-driven crime wave in St. Louis, we can confidently say that there's something fishy in the air – and no, it's not just the smell of fried catfish from the riverside restaurants.

Now, before you start dusting off your old gas masks and investing in air purifiers, let's take a moment to appreciate the lighthearted yet intriguing nature of this investigation. After all, where else can you find a study that marries the complexities of crime rates with the whimsical world of air pollution? It's as if Sherlock Holmes took a detour through the city's smog-filled streets in search of clues, only to stumble upon a trail of statistical breadcrumbs leading straight to the Environmental Protection Agency.

In the spirit of good humor and a fond farewell to this smoggy saga, it's time to call it a day on this particular avenue of research. After all, when it comes to the connection between air pollution and violent crime, we've already blown through more puns and unexpected twists than a Hollywood blockbuster. So, let's raise our metaphorical hats to the enigmatic allure of this peculiar correlation and bid adieu to the hazy mysteries of St. Louis. It's been a wild ride, but we're confident that no further research is needed in this somewhat smoggy, somewhat crime-ridden realm.