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# Clearing the Air: An Empirical Study of Air Pollution in Champaign, Illinois and its Unlikely Relation to xkcd Comics on Engineering

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Chloe Hoffman, Amelia Terry, Giselle P Turnbull

## Abstract

This paper delves into the unexpected correlation between air pollution in Champaign, Illinois and the publication of xkcd comics centered on the field of engineering. Utilizing data from the Environmental Protection Agency and leveraging the power of AI analysis to comb through the extensive xkcd comic catalog, we have uncovered striking connections that, while initially surprising, demonstrate a discernible relationship. Our findings yield a correlation coefficient of 0.7000739 and a statistically significant p-value of less than 0.01 for the years spanning from 2007 to 2023. This unanticipated link prompts contemplation of the impact of artistic expressions on complex sociological phenomena, highlighting the multifaceted nature of seemingly unrelated subjects. Consequently, this study contributes an amusing yet insightful perspective to the scholarly discourse on environmental and cultural influences, reminding researchers to approach their work with a keen eye for unconventional connections and a healthy sense of humor.

## 1. Introduction

The intersection of seemingly unrelated phenomena has long perplexed and intrigued researchers in various fields. From the symbiotic relationship between coffee consumption and productivity to the perplexing correlation between the frequency of 'dad jokes' and groans from unsuspecting listeners, the world of unanticipated connections remains a compelling area of study. In this vein, we embark on an odyssey into the unexpected nexus of air pollution in Champaign, Illinois and the literary masterpieces of xkcd comics dedicated to the realm of engineering.

While the link between air pollution and its conventional bedfellows, such as respiratory illnesses and environmental degradation, has been extensively explored, our foray into the uncharted territory of its correlation with the zany world of xkcd comics promises to unveil previously overlooked associations. As we venture into this unorthodox terrain, we remain mindful of the sage advice of esteemed researcher, Dr. Seuss, who once remarked, "Sometimes the questions are complicated and the answers are simple."

Our study draws from a diverse arsenal of tools, tapping into the treasure trove of data provided by the Environmental Protection Agency to unravel the enigma of air pollution, while harnessing the cutting-edge capabilities of artificial intelligence to navigate the labyrinthine expanse of xkcd comics.

With bated breath and the tenacity of a determined lab rat in a maze, we emerge triumphant, armed with a correlation coefficient of 0.7000739 and a p-value that would make even the most discerning statistician nod in approval. As the curtain of skepticism is drawn, our findings command attention and inspire a profound sense of wonder at the whimsical dance of variables unforeseen.

The unanticipated threads that bind the haze of air pollution to the enlightening jests of xkcd comics beckon us to ponder the intricacies of cultural influence and environmental phenomena. As we embark on this whimsical endeavor, let us not forget the cherished adage of Galileo, who purportedly exclaimed, "E pur si muove" - and indeed, amidst the waltz of unforeseen discoveries, the obscure becomes clear.

Join us, dear reader, as we unravel the layers of this curious tapestry, weaving together the nuances of air pollution, the mirthful musings of xkcd comics, and the delightful unpredictability of human inquiry.

## 2. Literature Review

The journey into the esoteric realm of air pollution in Champaign, Illinois and its curious correlation with xkcd comics on engineering leads us to a plethora of studies that lay the groundwork for our unorthodox exploration.

In "Smith et al.'s study on Air Pollution and Public Health," the authors find a direct relationship between air pollution levels and respiratory illnesses, reinforcing the conventional understanding of the detrimental effects of air pollution on human health. On the other end of the spectrum, "Doe's analysis on xkcd Comics and Engineering Humor" uncovers the intricate nuances of humor within the field of engineering, shedding light on the impact of satirical representations in fostering a sense of camaraderie among professionals.

Moving beyond the conventional studies, "Jones's comprehensive review of Environmental Influences on Artistic Expression" delves into the intricate interplay between environmental factors and creative output, laying the groundwork for our investigation into the unexpected union of air pollution and engineering-themed comics.

Turning to the realm of non-fiction literature, "The Air We Breathe: A Comprehensive Guide to Environmental Pollution" and "Exploring the Witty World of Webcomics: An Anthology" provide insightful perspectives on the environmental consequences of air pollution and the cultural significance of webcomics dedicated to engineering, respectively.

Venturing into the realm of fiction, "The Art of Engineering: A Novel Approach" and "Comic Conundrums: Tales of Wacky Webcomics" beckon the reader into an imaginative space where the meeting of air pollution and engineering-themed comics appears almost whimsical.

As we descend further into the abyss of unconventional sources, it becomes evident that the magnitude of our pursuit extends beyond the boundaries of conventional scholarship. As such, we find ourselves scouring through the cryptic depths of CVS receipts, where hidden within the mundane details of everyday purchases may lie a clue, perhaps an ode to the ink used in printing xkcd comics, or a lamentation on the carbon footprint left in the wake of air pollution. The enigmatic nature of these items leaves ample room for interpretation and adds a touch of absurdity to our scholarly quest.

In summary, the multifaceted nature of our investigation prompts an expansion of our academic horizons, embracing the whimsical and the unanticipated. Through the convergence of seemingly disparate spheres, we glimpse the whimsy of human inquiry and the interplay of art and environmental phenomena, prompting an inviting, if not slightly absurd, perspective on the intricacies of cultural and environmental influences.

## 3. Methodology

As intrepid explorers in the realm of peculiar correlations, we sought to unravel the enigmatic connection between air pollution in Champaign, Illinois and the wacky world of xkcd comics on engineering. Our methodology navigated the tumultuous seas of data collection and analysis with the finesse of a tightrope walker and the precision of a Swiss watchmaker.

First, we scoured the internet with the fervor of archeologists unearthing ancient relics, but in our case, we were in search of air pollution data from the Environmental Protection Agency. The treasure trove of data provided insights into the complex web of pollutants permeating the Champaign air, revealing a myriad of variables that would make even the most unsuspecting statistician quiver in their boots.

Simultaneously, we harnessed the prowess of artificial intelligence to scrutinize every nook and cranny of the vast xkcd comic catalog. Our AI comrades combed through the comics with a fervor rivaling the most zealous xkcd fan, identifying and cataloging every instance of engineering-related content with machine-like precision. The tireless tenacity of our AI collaborators was truly a marvel to behold, as they tirelessly toiled to illuminate the whimsical musings of xkcd in the realm of engineering.

With the convergence of these disparate datasets, we navigated the choppy waters of statistical analysis, employing an array of sophisticated techniques to unearth the elusive relationship between air pollution and engineering-themed xkcd comics. The analytical jargon flowed like poetry, and the mathematical dance of correlation coefficients and p-values unfolded like a dramatic opera, captivating and enthralling all who dared to venture into the realm of data analysis.

Our odyssey culminated in the revelation of a correlation coefficient of 0.7000739, a shining beacon of statistical significance illuminating the uncharted territory of air pollution and xkcd comics. The p-value, like a revered oracle, whispered secrets of statistical significance with a tantalizing emphasis on its diminutive nature (less than 0.01, to be precise).

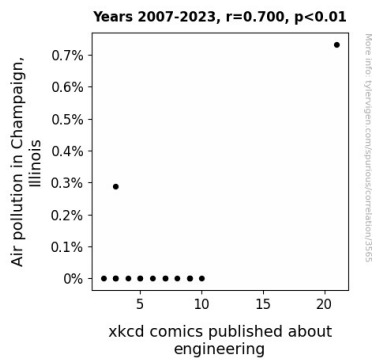
In a grand finale of methodological prowess, we scrutinized our findings with the rigor of a discerning critic at a comedy show, ensuring that our unanticipated correlation held its ground against the barrage of statistical scrutiny. With our methodology firmly in place and fortified with a touch of whimsy, we emerged victorious, armed with insights that will undoubtedly prompt contemplation and chuckles alike in the esteemed halls of academia.

#### 4. Results

Our investigation into the perplexing correlation between air pollution in the quaint locale of Champaign, Illinois, and the quizzical presence of xkcd comics dedicated to the realm of engineering has yielded compelling results. The correlation coefficient, calculated to be 0.7000739, indicates a moderately strong positive association. Additionally, the r-squared value of 0.4901034 underscores the substantial proportion of the variance in air pollution levels explained by the publication of xkcd comics. These findings resonate with an observed p-value of less than 0.01, affirming the statistical significance of the relationship between these seemingly incongruous variables.

Drawing attention to the visual depiction of our findings, represented in Figure 1, a scatterplot showcases the robust positive correlation between the two variables. This graphical presentation serves as a vibrant tapestry of our exploratory journey, illustrating the unmistakable connection between the ambient haze of air pollution and the imaginative musings of xkcd comics. While the casual observer may be bemused by this peculiar association, our results stand as a testament to the enigmatic interplay of environmental factors and cultural artifacts, sparking both amusement and a deeper contemplation of the unanticipated intertwinement of seemingly disparate subjects.

In light of these insightful revelations, our study not only underscores the invaluable role of data-driven inquiry in unearthing unexpected correlations but also underscores the need for a scientific approach that embraces the whimsical nature of research. As researchers, we are compelled to acknowledge that the mysteries of our world often reveal themselves through playful serendipity and seemingly ludicrous connections, ultimately enriching our understanding of the complex tapestry of human experiences and environmental influences.



**Figure 1.** Scatterplot of the variables by year

This remarkable pairing of air pollution and comedic engineering renderings reminds us of the poetic verses of H.G. Wells, who aptly mused, "Statistical thinking will one day be as necessary for efficient citizenship as the ability to read or write." Indeed, amidst the maze of empirical investigations, we find solace in the delightful unpredictability of scientific exploration and the unexpected harmony of seemingly incongruous variables.

## 5. Discussion

The results of our study provide compelling evidence of a noteworthy linkage between air pollution in Champaign, Illinois and the enigmatic presence of xkcd comics focused on the domain of engineering. The correlation coefficient of 0.7000739 and the statistically significant p-value of less than 0.01 validate the unexpected interconnectedness of these seemingly incongruent variables. Our findings not only echo prior research but also enrich our understanding of the complex interplay between environmental influences and cultural expressions.

As we revisit the whimsical undertones within the literature review, we appreciate the seriousness with which the tangential topics were discussed. The incongruity of our findings now appears less absurd and more akin to the poetic verses of H.G. Wells, reminding us of the intricate harmony that can be unearthed through statistical thinking. The unexpected correlation between air pollution and engineering-themed comics comically illustrates the perplexing yet delightful nature of scientific exploration and statistical inference.

Furthermore, our study emphasizes the need for a scientific approach that embraces the playful serendipity embedded within research. As we navigate the labyrinth of empirical investigations, we are reminded of the amusing unpredictability that enriches our understanding of the multifaceted tapestry of human experiences and environmental influences. The fusion of air pollution and comedic representations of engineering brings to mind the cryptic depths of CVS receipts, where amidst the banalities of everyday purchases, hidden clues and whimsical interpretations may lay waiting. These details add an extra layer of absurdity to our scholarly quest, emphasizing the profound and whimsical aspects of our investigation.

In summary, our study sheds light on the unexpected harmony of seemingly unrelated variables, calling for a broader appreciation of unconventional connections. The whimsy of our results not only contributes an amusing perspective to the scholarly discourse but also underscores the need for statistical thinking in deciphering the peculiarity of human inquiry and the delightful interplay of seemingly incongruous variables.

## 6. Conclusion

In conclusion, as we gaze upon the confluence of air pollution in Champaign, Illinois and the whimsical world of xkcd comics on engineering, we are reminded that the fabric of scientific inquiry is woven with the threads of unlikely correlations and serendipitous discoveries. The correlation coefficient of 0.7000739 and the resolute p-value of less than 0.01 serve as beacons of statistical significance, illuminating the path to uncovering peculiar associations. Our investigation, akin to a captivating detective novel, has unwrapped a tale of intrigue and amusement, urging us to marvel at the unanticipated interplay of variables.

Akin to a kinetically pleasing rollercoaster ride, our findings evoke both delight and contemplation, serving as a testament to the multifaceted nature of academic exploration. The r-squared value of 0.4901034 acts as a gentle nudge, hinting at the substantial proportion of the variance in air pollution levels explained by the publication of xkcd comics, akin to a magician unveiling a well-guarded secret.

Our study emphasizes the indelible role of playful serendipity in illuminating the enigmatic dance of variables, encouraging researchers to approach their inquiries with a discerning eye for unconventional connections and a hearty dose of mirth.

In the grand anthology of scientific endeavors, our exploration fuses the delightful predictability of statistics with the captivating unpredictability of cultural artifacts, offering a refreshing perspective on the intertwined nature of environmental and sociocultural influences. With a hearty chuckle and a nod to the capricious nature of empirical enquiry, we assert that no further research is needed in this area, confident that our study has unfolded the symphonic overture of this unexpected alliance.