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Letter from the Editor

I am excited to present the latest edition of *The Oak Leaf* to you. Let's start with a note that is both sad and exciting. Dr. Sandra Gilliland, the founder of CORE, the Center for Opportunity, Research, and Experiential Learning, will leave us for an opportunity to develop a graduate program in counseling at Ouachita Baptist University in Arkansas. *The Oak Leaf* is embedded in CORE, and everyone working for our journal has enjoyed the advice and help provided by Dr. Gilliland. We wish her best of luck and much success! The new director of CORE is Dr. Cheryl Bardales, who is devoted to CORE and is an outstanding leader with whom all are excited to work.

As you know from the fall edition, *The Oak Leaf* now has managing editors. We are currently looking for a new Managing Editor for the Natural Sciences. We have gained several new reviewers whom we warmly welcome. We are also still looking for more reviewers from other universities. Our existing reviewers and managing editors do their best to contact potential candidates.

I introduced students and mentors of the first edition to you in fall, and I am pleased to do the same for the students and mentors of the second edition. We all know the stress of finishing projects and assignments at the end of the semester. Nevertheless, our extremely hard-working students managed to finish their papers with the help of their mentors and the reviewers. I would also like to stress the work of the reviewers who have to take time off for a writing project that is not their own, all in the spirit of helping students to succeed. Eight students get published in volume three, issue two of *The Oak Leaf*. Emrie Albritton (mentor: John Marks) reviews *Monster: The Autobiography of an L.A. Gang Member*; Austin Gaspard (mentor: Christopher Stacey) examines correlating themes in the Fallout series and the Cold War; Shinji Hain, Jordan Beard, and Austin Manuel (mentor: Prakash Ghimire) calculate a multiple linear regression model to predict real estate prices; Deanna Hirchak (mentor: Susan Bowers) explores the relationship between dietary choices and the origin and reversal of type 2 diabetes; Kevin Oakley (mentors: Sandra Gilliland and Mark LaCour) researches the effect of leadership styles on organizational committees; and Christian Singletary (mentor: Christopher Stacey) investigates sawmill towns and the industrialization of the New South. Several other manuscripts are undergoing the revision process in preparation for inclusion in the fall 2023 edition of *The Oak Leaf*.

Don't be shy; submit your manuscript in the summer. The editors eagerly anticipate many new and interesting papers. In case you are graduating, don't forget that you have one more year to submit your article.

We wish you outstanding final exams and to see you back again in fall!

Christof Stumpf
Editor-in-Chief, *The Oak Leaf*

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Hotspot of Conspiracy: An Examination of the Correlating Themes in the *Fallout* Series and the Cold War

Austin Gaspard

The *Fallout* series is a renowned RPG that exposes the player to the aftermath of a nuclear holocaust set in an alternate reality where the world bore witness to the horrors of nuclear fallout after the global superpowers ended up going to war with each other. The world of *Fallout* takes place in the distant future, approximately eighty to one hundred and sixty years from the present day. However, the common history diverges after the end of World War II. The Cold War still occurs, but does end up spiraling into a hot war decades later between the United States and China. The game itself draws on inspiration from magazines and comics of the 1950s and maintains a very retro aesthetic to the technology and clothing, despite the game taking place centuries later. Of course, the series does take some liberties in some more dramatic ways to draw players in, but there are some very real themes that were, and still are, present in regards to nuclear warfare and its aftermath. The game also mirrors real-world happenings in the game that may go undetected by a majority of the player-base and outside viewers. Radioactive mutation and mutually assured destruction are two physical themes explored often in the games and in the history since the first nuclear weapons were deployed. Last, the game includes themes such as government secrecy and espionage, morally ambiguous decisions, and general distrust of outside groups.

Radioactive mutation has been dramatized and over exaggerated for decades, with a prime example being the nuclear-powered monster known as Godzilla, who is often seen as a metaphor for the destructive capabilities of nuclear weapons. *Fallout* has no shortage itself of mutated beasts in wake of the nuclear onslaught, with mutated insects, mammals, reptiles, and even humans roaming the entirety of the now desolate United States. These monstrosities give a carnal form to nuclear fallout that is very exaggerated, but highlights the fear of what nuclear weapons can do not only in the moment of their detonation, but also in the following days, months, or even years. Perhaps the most frightening of the irradiated specimens encountered are the “ghouls,” the people who were unable to make their way into one of the many vaults located in the nation. These ghouls are quite different from the other fauna encountered, being in a halfway state of rot and on the verge of going into a feral frenzy in the event of over exposure to radiation. Despite their grotesque appearance, many ghouls are still just human in nature, but due to their appearance, they face discrimination and are often humiliated by humans who survived the nuclear fallout without any major physical harm.

Science fiction writers used people’s fear and curiosity to profit by producing mass quantities of apocalyptic and post-apocalyptic writings and films. Many of these

stories found homes in the cheap and readily available pulp fiction magazines.[1] The authors often took creative liberties with the writings and skewed or just completely omitted facts, substituting their own instead. Here is where many preconceived notions of nuclear radiation come from, with young, impressionable teenagers picking up the newest issue of a magazine during the early stage of the Cold War and suddenly being told how these newly developed weapons of mass destruction can alter global existence.[2]

The truth behind the effects of nuclear radiation is equally terrifying to that of Fallout, though not in the same way. In reality, harmful amounts of radiation more often negatively impacts the individual affected, leaving it sickly and lethargic, as opposed to granting physical strength and constitution at the price of someone's psyche or appearance. Lethal amounts of radiation can result in burns on the skin, serve as a carcinogen, induce radiation poisoning, and attack different parts of the anatomy system as well as the DNA, resulting in genetic issues should an individual reproduce later on.[3] These problems (and more) can be seen in the survivors of Hiroshima and Nagasaki, called hibakusha, literally "person affected by a bomb." In a way, the ghouls of Fallout offer a relatively accurate portrayal of the effects of overexposure to gamma radiation when examining the actual side effects.

The idea that nuclear war will only result in the destruction of civilization is another fairly old theme that came about almost immediately after the detonation of the bombs. Dr. Strangelove is an excellent example of the anxiety and tension felt in the upper echelons of government on both sides of the war, showing the understanding and fear regarding nuclear weapons and their capabilities. A quote often attributed to Albert Einstein goes "I do not know with what weapons World War III will be fought, but World War IV will be fought with sticks and stones." This quote, though anecdotal and not confirmed, first appeared in 1947 reference to Einstein and is obviously regarding the use of nuclear weapons and their destructive abilities.[4] The quote highlights that the use of these weapons en masse would cause mass destruction, sending the world back into another Stone Age. A reporter at Bikini Atoll attributes a similar quote to an unnamed Army Lieutenant in 1946, showing that his sentiment was not newly founded and was recognized by those who oversaw the use of the bombs. In Fallout, the main character roams the wastelands, running into scavengers and different social groups that formed after the war. These groups closely resemble the tribal clans of the stone and bronze age in humanity. So, while not depicting people using literal stones and spears, the mindset of people in the absence of a centralized government destroyed by war, reverting back to the clan mentality that humans beginning their evolutionary progression.

The Cold War brought about new levels of government secrecy and espionage worldwide. Not only were countries attempting to hide information from foreign competitors, but they were trying to hide things from their citizens as well. For example, numerous presidents attempted to hide and cover up different scandals, Dwight D. Eisenhower attempted to change the narrative surrounding the Soviets shooting down a U2 spy plan, claiming it crashed, stating it was a fallen weather plane. And Richard Nixon lied about his involvement in the Watergate scandal.[5] During the Cold War, agencies like the CIA and KGB took on leading roles for their respective governments, and did a majority of their work in secret, using a calamity to mask their true intentions or weaving a false story to win over the public's support.

The United States government also dabbled excessively in human experimentation under false notions and

without true consent. During the decades following the end of World War II, the United States tested the effects of radiation and chemical exposure in experiments such as the Holmesburg program, where prisoners were subjected to various herbicides and chemicals to study the effects, and experiments in psychological trauma and torture, with the CIA attempting to make truth serums and doctors being ordered to inject patients with lethal amounts of drugs like morphine and LSD. These acts of espionage and secrecy were supported by government reports, like the Doolittle Report, defending the use of the CIA as a way to even the odds between the Democratic U.S. and the Communist Soviets.[6] The Soviet Union also performed tests with poisons on prisoners in the Gulag. Under the control of Laboratory 1, prisoners were exposed to mustard gas, cyanide, and more as experiments for the Soviet special services.[7] The results would be used to plan the assassinations of various leaders and influential figures.

The same ordeal occurs in *Fallout*, through a government contract the Vault Tec company built one hundred and twenty-two vaults under the guise of preparation for nuclear war. The United States government then set up experiments to observe how groups handled the stress of surviving the fallout and how well they would repopulate after being released. Among the various experiments were some fairly heinous tests that, of course, would have been impossible to observe normally, but through circumstance and conspiracy it was possible. The experiments ranged from eugenics to crop mutation, and just about everything in between. Subjects were exposed to these experiments without their consent or even knowledge something was occurring. Many of the tests were brutal enough to eliminate the entirety of the vault subjects, and others incited riots and rebellion after several decades of experimentation.

The Cold War marked a very dark time in the world's modern history, filled with secrecy, betrayal, and conspiracy. The *Fallout* series is an excellent source, intentionally or not, for examining the relevant themes found during this era, and while some of the themes are exaggerated to a degree, perhaps the worst of them are as true to life as could possibly be done. The experiments present in the game and history were disgusting acts of overreach and abuses of power by the governments in charge, using their own citizens as test subjects and then covering up the plot to hide it from the public's eyes.

Notes

[1]O. O. Binder, "Mechanix Illustrated 1953-12: Vol 49 ISS 8 : Free Download, Borrow, and Streaming," Internet Archive (Time Incorporated, December 1, 1953), https://archive.org/details/sim_todays-homeowner-solutions_1953-12_49_8/page/108/mode/2up, 108-109.

[2]Philip Wylie, The Smuggled Atom Bomb (New York, NY: Lancer Books, 1967).

[3]"Accidents at Nuclear Power Plants and Cancer Risk," National Cancer Institute, May 12, 2022, https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/nuclear-accidents-fact-sheet#:~:text=At%20high%20doses%2C%20ionizing%20radiation,cataracts%2C%20as%20well%20as%20cancer.

[4]Dan Evon, "Did Albert Einstein Say World War IV Will Be Fought 'with Sticks and Stones'?," Snopes (Snopes.com, April 16, 2018), https://www.snopes.com/fact-check/einstein-world-war-iv-sticks-stones/.

[5]Sergei Khrushchev, "The Day We Shot down the U-2," AMERICAN HERITAGE (American Heritage, December 1, 2022), https://www.americanheritage.com/day-we-shot-down-u-2.

[6]James H. Doolittle et al., "Reports on the Covert Activities of the Central Intelligence Agency," Central Intelligence Agency (Central Intelligence Agency, May 7, 2002), https://www.cia.gov/readingroom/document/cia-rdp86b00269r000100040001-5.

Primary Bibliography

Binder, O. O. “Mechanix Illustrated 1953-12: Vol 49 ISS 8 : Free Download, Borrow, and Streaming.” Internet Archive. Time Incorporated, December 1, 1953. https://archive.org/details/sim_todays-homeowner-solutions_1953-12_49_8/page/108/mode/2up.

Conahan, Frank C. “An Overview on Cold War Era Programs - Government Accountability Office.” U.S. Government Accountability Office, September 28, 1994. https://www.gao.gov/assets/t-nsiad-94-266.pdf.

Doolittle, James H., William B. Franke, Morris Hadley, and William D. Pawley. “Reports on the Covert Activities of the Central Intelligence Agency.” Central Intelligence Agency. Central Intelligence Agency, May 7, 2002. https://www.cia.gov/readingroom/document/cia-rdp86b00269r000100040001-5.

Kerr, Donald M. “Federation of American Scientists.” NRO Review and Redaction Guide for Automatic Declassification of 25-Year-Old Information. National Reconnaissance Office Review and Redaction Guide, May 20, 2005. https://irp.fas.org/nro/declass.pdf.

Khrushchev, Sergei. “The Day We Shot down the U-2.” AMERICAN HERITAGE. American Heritage, December 1, 2022. https://www.americanheritage.com/day-we-shot-down-u-2.
Wylie, Philip. The Smuggled Atom Bomb. New York, NY: Lancer Books, 1967.

Secondary Bibliography

“Accidents at Nuclear Power Plants and Cancer Risk.” National Cancer Institute, May 12, 2022. https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/nuclear-accidents-fact-sheet#:~:text=At%20high%20doses%2C%20ionizing%20radiation,cataracts%2C%20as%20well%20as%20cancer.

Condis, Megan. “Fantasizing about the Apocalypse: A Review of Fallout 4.” Resilience: A Journal of the Environmental Humanities 4, no. 2–3 (2017): 185–90. https://doi.org/10.5250/resilience.4.2-3.0185.

Evon, Dan. “Did Albert Einstein Say World War IV Will Be Fought ‘with Sticks and Stones’?” Snopes. Snopes.com, April 16, 2018. https://www.snopes.com/fact-check/einstein-world-war-iv-sticks-stones/.

Gaddis, John Lewis. The Cold War: A New History. New York, NY: Penguin Books, 2007.

Richelson, Jeffrey T., ed. “Science, Technology and the CIA.” The National Security Archive. The George Washington University, September 10, 2001. https://nsarchive2.gwu.edu/NSAEBB/NSAEBB54/.

Volodarsky, Boris. “The KGB’s Poison Factory.” The Wall Street Journal. Dow Jones & Company, April 7, 2005. https://www.wsj.com/articles/SB111282082770699984.

Multiple Linear Regression (MLR) Model to Predict Real Estate Prices in the Pecan Bayou Subdivision, Alexandria, Louisiana.

Shinji Hain, Jordan Beard, Austin Manuel

Abstract

The real estate market has been a primary research area for mathematicians, statisticians, and economists for its significant impact on relevant sectors such as investment, job creation, construction, etc. This paper establishes a Multiple Linear Regression Model for housing price prediction. We apply the real estate prices data set in Pecan Bayou Subdivision, Alexandria, Louisiana, to test the method. The data analysis and test in this paper show that the multiple linear regression model can effectively predict and analyze housing prices to within a given set of parameters (or variables, you chose). At the same time, the algorithm can still be improved through more advanced data analysis techniques.

Keywords: Multiple Linear Regression, Regression Analysis, Real Estate, Housing Price Prediction, Data Analysis

Real estate is an established and constantly growing part of our economy with an average increase of 3.8% per year between 2017 and 2022, making it worth delving into for research and areas of study. Creating mathematical models to accurately predict housing prices within a given range, while challenging, would be beneficial for numerous reasons. Such models would help realtors without relying heavily on the market value using previously-known perceived deals from house-hunters, and self-evaluations. Using statistical analysis to determine prices also eliminates any biasedness from listings as it uses previous data from like homes all over the same district. We present our findings for a multiple linear regression model to predict prices of future houses in Pecan Bayou Subdivision in Alexandria, Louisiana.

The results of our model include using the variables Square footage (x_1), Lake (x_2), Crime z-score (x_3), and "Year sold" (x_4). These variables are used to make the best model to predict housing prices out of the eleven independent variables acquired. The eleven variables consist of, Square footage (x_1), Lake (x_2), Crime z-score (x_3), "Year sold" (x_4), Price per square foot (Ppsf) (x_5), Acreage (x_6), Bedroom (x_7), Bathroom (x_8), Garage (x_9), Crime Index (x_{10}), and Covid (x_{11}). The final multiple linear regression model equation is as follows:

$$y = -30073 + 0.16503x_1 + 28.82x_2 + 19.34x_3 + 14.89x_4$$

Lake (x_2) uses binary values (0,1). The value is 1 if the house has accessibility to a lake, and 0 if the house does not have direct access to a lake. The Crime z-score is calculated using the Crime Index.

Figure 1: Model Summary - displaying standard error, and R values.

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
21.7531	93.85%	93.25%	92.24%

Standard error is the average distance that the values fall from the regression line, calculating how wrong the regression model is on average. The standard error of our multiple linear regression model is 21.7531 (in thousands of US dollars). R-squared (predicted) is a measure of how close the data are to the fitted regression line. The R-squared (predicted) of the model is 92.24%.

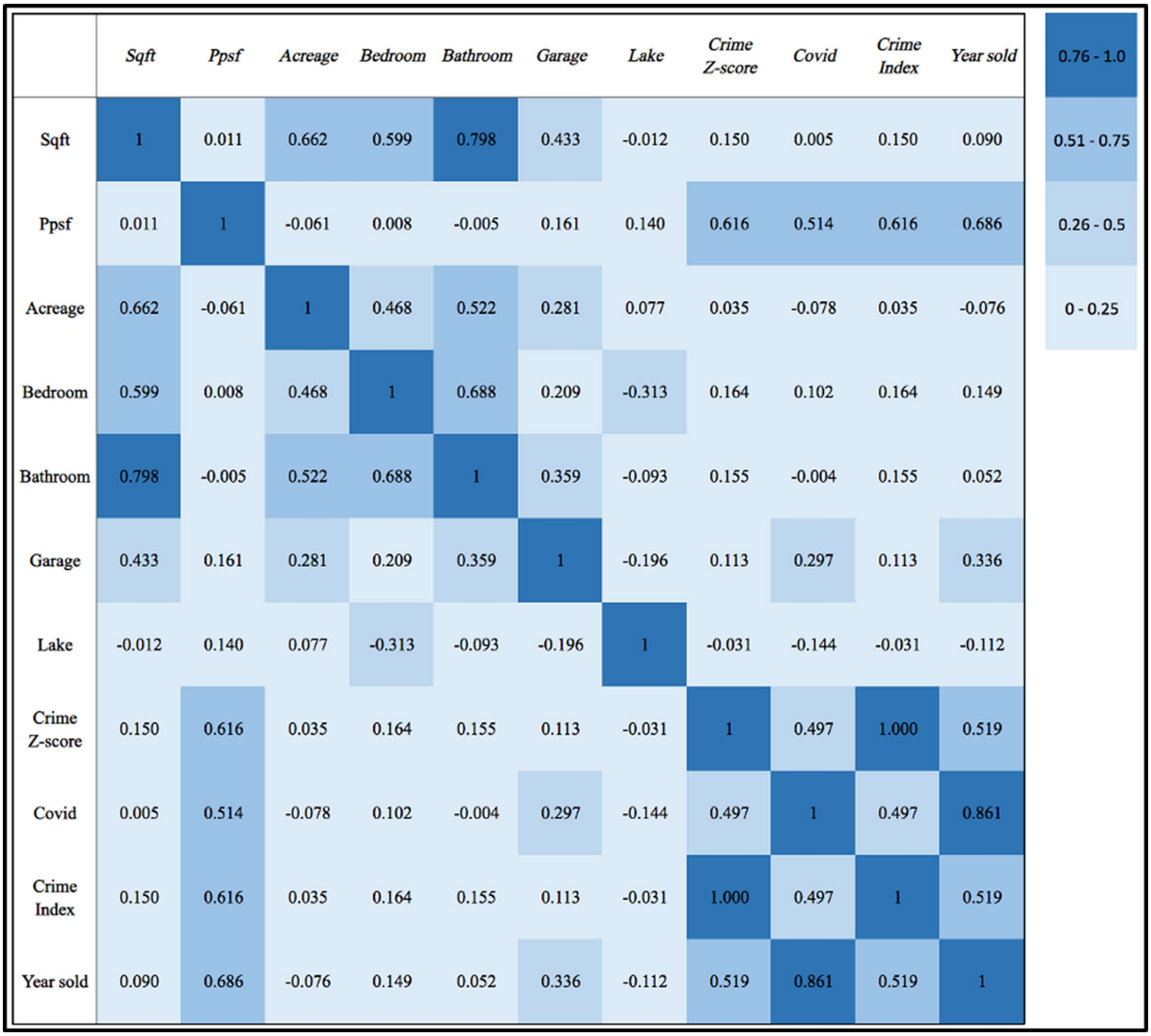
The process of collecting data on the houses that occupy the Pecan Bayou Subdivision includes using Zillow, Realtor, and in-person observations to verify house addresses, lake accessibility, and construction status. The Covid (x_{11}) variable also uses binary values (0,1). The value is 0 if the "Year sold" is before 2020, and 1 if the "Year sold" is during or after 2020. After collecting all available data on 131 houses, 45 houses had viable data (viable data consists of no missing information on any variable). (Appendix 1 - Data Pertaining to Pecan Bayou Subdivision)

A scatter plot was used to identify the relationship between the independent variables (x_n) and the dependent variable (y). The simple linear regression between square foot (x_1) and price (y) has an R-squared of 0.8084. Square footage was included in the model for its strong positive relationship to price. Lake (x_2) to price (y) has an R-squared of 0.0053. Crime z-score (x_3) to price (y) has an R-squared of 0.1577. "Year sold" (x_4) to price (y) has an R-squared of 0.16. (Appendix 2 - Scatter Plots) Variables x_2, x_3, and x_4 all have relatively no relationship to y ; however, when utilized in the multiple regression model with x_1, all variables are statistically significant and only add value to the model. When deciding which independent variables add value to the model, each variable must be statistically significant, and independent variables cannot be multicollinear. Multicollinearity refers to when two or more independent variables account for the same or similar variance of change in the dependent variable. When variables are multicollinear, the variables are not unique to each other. To maintain the integrity of the model, one must remove the lesser variables to ensure statistical significance ultimately only keeping the single most valuable variable. Constructing a correlation heat map calculates the correlation between the independent variables to aid in identifying multicollinearity. The correlation value between pairs of variables ranges between –1 and 1. Perfect direct relationships correspond to positive values, perfect inverse relationships correspond to negative values, and a value of 0 indicates no relationship. The correlation heat map of independent variables from this model has been included in Figure 2.

Interpreting the heat map, the darker colors translate to a stronger correlation. Variables with a correlation greater than 0.65 indicate multicollinearity, and the subsidiary variable was removed to avoid such multicollinearity. As previously addressed, the Crime z-score (x_3) is calculated using the Crime Index (x_{10}) values, as well as Covid (x_{11}) values determined by Year Sold (x_4). Due to their fundamental relationship, those pairs of variables incur high multicollinearity. After reviewing the strength of the relationships between the independent variables (x_n) where n=1,2,3,...,11, versus the dependent variable (y), and identifying multicollinear relationships. The subsidiary variables, Acreage (x_6), Bathroom (x_8), Price per square foot (Ppsf) (x_5), Crime Index (x_{10}), and Covid (x_{11}) are deemed invaluable for the model. Although Bedroom (x_7) and Garage (x_9) are not multicollinear with our selected independent variables, these variables are not statistically significant with high p-values. Such variables are considered overfitting variables and their inclusion would lessen the integrity of the model.

After understanding the relationships between all independent variables as well as the relationship between each x_n (where n=1,2,3,…,11) versus y, Minitab's forward selection of terms was used to select independent variables maintaining the model's statistical significance. A breakdown of the steps included in creating our model on Minitab is displayed in Figure 3.

Figure 2: Correlation Heat Map – displays the relationship between two independent variables.



	Sqft	*Ppsf*	*Acreage*	*Bedroom*	*Bathroom*	*Garage*	*Lake*	*Crime Z-score*	*Covid*	*Crime Index*	*Year sold*
Sqft	1	0.011	0.662	0.599	0.798	0.433	-0.012	0.150	0.005	0.150	0.090
Ppsf	0.011	1	-0.061	0.008	-0.005	0.161	0.140	0.616	0.514	0.616	0.686
Acreage	0.662	-0.061	1	0.468	0.522	0.281	0.077	0.035	-0.078	0.035	-0.076
Bedroom	0.599	0.008	0.468	1	0.688	0.209	-0.313	0.164	0.102	0.164	0.149
Bathroom	0.798	-0.005	0.522	0.688	1	0.359	-0.093	0.155	-0.004	0.155	0.052
Garage	0.433	0.161	0.281	0.209	0.359	1	-0.196	0.113	0.297	0.113	0.336
Lake	-0.012	0.140	0.077	-0.313	-0.093	-0.196	1	-0.031	-0.144	-0.031	-0.112
Crime Z-score	0.150	0.616	0.035	0.164	0.155	0.113	-0.031	1	0.497	1.000	0.519
Covid	0.005	0.514	-0.078	0.102	-0.004	0.297	-0.144	0.497	1	0.497	0.861
Crime Index	0.150	0.616	0.035	0.164	0.155	0.113	-0.031	1.000	0.497	1	0.519
Year sold	0.090	0.686	-0.076	0.149	0.052	0.336	-0.112	0.519	0.861	0.519	1

0.76 - 1.0
0.51 - 0.75
0.26 - 0.5
0 - 0.25

Forward Selection of Terms

Candidate terms: Sqft, Lake, Crime, Year sold

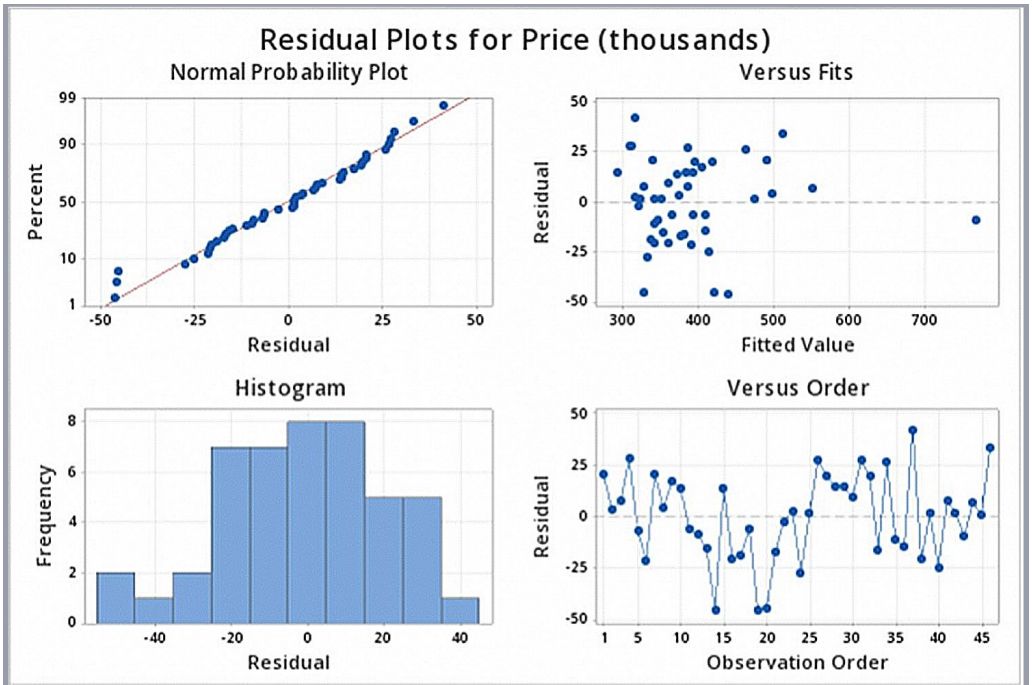
	-----Step 1----		-----Step 2-----		-----Step 3-----		-----Step 4-----	
	Coef	P	Coef	P	Coef	P	Coef	P
Constant	-13.3		-36387		-37924		-30073	
Sqft	0.1733	0.000	0.16770	0.000	0.16775	0.000	0.16503	0.000
Year sold			18.02	0.000	18.77	0.000	14.89	0.000
Lake					29.7	0.007	28.82	0.005
Crime							19.34	0.005
S		37.0499		25.5580		23.6709		21.7531
R-sq		80.84%		91.09%		92.54%		93.85%
R-sq(adj)		80.41%		90.68%		92.00%		93.25%
Mallows' Cp		85.64		19.36		11.73		5.00
AICc		467.40		434.58		428.97		422.74
BIC		472.31		440.92		436.61		431.56

α to enter = 0.25

Figure 3: Minitab - forward selection of steps of terms step breakdown.

Shown above in Figure 3, Square footage (Sqft) (x_1) is the best fitting variable and adds 80.84% to R-squared. The next best variable is "Year sold" (x_4) adding an additional 10.25% to R-squared. Despite Lake (x_2) and Crime z-score (x_3) only improving the R-squared by less than 2%, x_2 and x_3 still account for a unique portion of variance in price not accounted for by other independent variables. As the quality of the model increases the standard error in thousands of dollars decreases from 37.05 to 21.75 (in thousands of US dollars). A Coefficient table (Appendix 3) and Analysis of Variance (ANOVA) table (Appendix 4) are also considered to confirm that no overfitting occurs. When the Variance Inflation Factor (VIF) is less than 10 one can conclude all the variables are statistically significant and not multicollinear. All the variables included are in fact statistically significant and have a VIF score less than 1.4, confirming that there is no multicollinearity in the model.

After running the model with 92.24% R-predicted, there are four properties that are considered unusual. Three of the properties have large residuals where the difference in predicted price versus the actual price is approximately 45,000 dollars. The fourth unusual observation does not have a large residual; however, the property's actual price is an outlier compared to the rest of the observations. These unusual observations are shown in the set of graphs displayed in Figure 4 alongside the table for Fits and Diagnostics for Unusual Observations.



Fits and Diagnostics for Unusual Observations

Obs	Price (thousands)	Fit	Resid	Std Resid	
14	284.5	329.9	-45.4	-2.39	R
19	395.5	441.3	-45.8	-2.16	R
20	376.8	421.7	-44.9	-2.15	R
43	759.0	768.4	-9.4	-0.65	X

R Large residual
X Unusual X

Figure 4: Residual Plots - displays fits and diagnostics for all and unusual observations.

Another multiple regression model with a higher R-squared value was created using Price per square foot (x_5) as a predictor variable. Despite having a statistically significant model with no multicollinearity, the model was conceptually limited. The purpose of the model is to predict the house's price; however, x_5 is calculated by dividing the price (y) by the square footage (x_1). Hence, x_5 cannot be used as a predictor variable due to its limitation.

On the small-scale achieved, the model is interesting and statistically significant for predictions of housing prices with relatively easy-to-find data that is available for most. Translation of this experiment to a larger scale could very well be useful. For example, making a model for an entire city or sections of cities could be beneficial and help numerous people. Investors in larger sections of real estate or entire subdivisions could also use such a model for determining property investment budgets and competitive pricing for comparable properties. A larger scale model would also allow for more detailed independent variables such as local pollution levels, poverty rates, local school districts, and other factors that do not translate well to one subdivision. Adding some of these variables would result in a better model with more accurate predictions and overall adequacy.

Multiple linear regression models can be used in numerous ways in related areas. A realtor can use multiple linear regression models to determine the best time to sell a house based on different independent variables. A stockbroker (or financial advisor) can determine when to sell stock in the stock market using previously known public data. This would be more difficult due to the volatility of the stock market, and there are other techniques like stochastic testing that would pose more useful however, it can be feasible. Multiple linear regression models can help in making business decisions. Originally a decision may be perceived as beneficial but, after looking at multiple factors, the decision may actually negatively affect the business. For example, as a business owner you consider staying open later as beneficial but ultimately lose profit when considering all the factors such as utilities, wages for employees, etc. These models can aid in amplifying efficiency within a company and in many other applications outside of real estate and the use for Pecan Bayou Subdivision.

Acknowledgements

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References

Larson, R. (2022). *Elementary Statistics* (8th ed.). Pearson.

Qingqi Zhang, "Housing Price Prediction Based on Multiple Linear Regression", *Scientific Programming*, vol. 2021. https://doi.org/10.1155/2021/7678931/.

Realtor. (2022). *Realtor.com®: Homes for sale, apartments & Houses for Rent*. realtor.com. Retrieved May 10, 2022, from https://www.realtor.com/.

Wikimedia Foundation. (2023, March 25). *Linear regression*. Wikipedia. Retrieved March 28, 2023, from https://en.wikipedia.org/wiki/Linear_regression/.

Zillow. (2022). *Real estate, apartments, Mortgages & Home values*. Zillow. Retrieved May 13, 2022, from https://www.zillow.com/.

Appendix

Appendix 1: Complete MLR Data for Pecan Bayou Sub-Division. - Data Pertaining to Pecan Bayou Subdivision

Appendix 2: Scatter Plots Between Independent Variables (used in the model) to the Dependent Variable. - Scatter Plots

Appendix 3: Coefficients Table

Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	-30073	5165	-5.82	0.000	
Sqft	0.16503	0.00755	21.85	0.000	1.02
Lake	28.82	9.59	3.01	0.005	1.01
Crime	19.34	6.54	2.96	0.005	1.39
Year sold	14.89	2.56	5.82	0.000	1.39

Appendix 4: Analysis of Variance (ANOVA) Table.

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	4	295868	73967	156.31	0.000
Sqft	1	225860	225860	477.31	0.000
Lake	1	4276	4276	9.04	0.005
Crime	1	4132	4132	8.73	0.005
Year sold	1	16027	16027	33.87	0.000
Error	41	19401	473		
Total	45	315270			

The Origin and Reversal of Type 2 Diabetes: Exploring the Effect of Dietary Choices on the Human Body

Deanna Hirchak

Abstract

Diabetes is a chronic health condition that negatively affects how the body converts food into energy. The result is an unusually high amount of sugar in the bloodstream, which causes impaired kidney function and other conditions. Type II Diabetes Mellitus (T2DM) has no known cause. Over the years, physicians have suggested that there may be a genetic factor that usually requires a second factor, such as obesity, to trigger the development of T2DM. The discovery of insulin and the advancement of developing synthetic insulin introduced the hope of a cure. However, it is still considered a "band-aid solution" because it fails to fix the underlying cause. Physicians began rethinking dietary changes that could combat the disease, but trending, low-carb diets, such as paleo and keto, produced more harmful long-term effects than expected. A "new" wildly effective dietary approach called the Whole Food Plant Based diet (WFPB) has recently been adopted by people with both Type 1 and Type 2 diabetes, and the results are astounding. By limiting all foods that cause insulin resistance, this diet can completely reverse type 2 diabetes and ease symptoms of type 1 diabetes with few side effects. Therefore, the closer a person can get to a WFPB diet, the lower the risk of T2DM and other comorbid diseases.

Keywords: diabetes, diet, insulin, disease, symptoms

Diabetes is the seventh leading cause of death in the United States, attributing to approximately 80,000 deaths per year, according to The American Diabetes Association (2022). Although researchers have been searching for a cure since before the discovery of the function of the pancreas in 1889, the prevalence of this disease continues to increase (McCoy 2009). Advances in modern medicine and current dietary trends have yielded only temporary or "band-aid" solutions. However, a method to decrease insulin resistance dramatically has been documented as far back as the 1930s (Greger 2018). A whole food, plant-based diet should be the primary method for preventing, managing, and reversing Type 2 diabetes. The closer a person can get to a whole-food, plant-based diet (WFPB), the lower their risk of Type 2 Diabetes Mellitus (T2DM) and other comorbid diseases (Greger 2018).

The discovery of diabetes around the 15th century opened doors to more questions and new answers in

the medical field. The first documented symptoms were recorded by Hesy-Ra, an Egyptian physician, in 1552 B.C.; they included frequent urination, emaciation, and in chronic cases, death (McCoy 2009). Ancient healers during this time also noted that the urine of people with this disease attracted ants (McCoy 2009). A characteristic of diabetes unknown during this time is excess sugar in the bloodstream caused by a lack of insulin; this characteristic is likely why ants were so attracted to the urine of people with diabetes. In 150 A.D., a Greek physician named Arateus described the disease as "the melting down of flesh and limbs into urine." While this definition may seem vague, it was a thought headed in the right direction (McCoy 2009). People began to diagnose this disease centuries later by using "water tasters," or people who tasted the sweetness of urine to provide a diagnosis; this discovery led to the formation of the scientific name for diabetes, or Diabetes "Mellitus," meaning "honey" (Culligan 2015). From then, Matthew Dobson, an English physician, noticed that the disease was fatal in some cases, and in others, it was simply chronic. At this moment, a clear distinction between Type 1 and Type 2 diabetes was identified (Higuera 2020). It is now understood that while Type 1 diabetes has no known cause, it triggers the immune system to attack insulin-producing cells as if they are harmful (CDC 2022). Because insulin cannot be transported between cells, sugars build up in the bloodstream. T2DM also has no exact cause, but there seems to be a genetic link, such as obesity, and usually requires environmental factors to trigger the disease (Mayo Clinic 2023). Although much remains to be learned about the causes, technological advancements provided more precise answers. Although it was still in its early stages, the discovery of diabetes was instrumental in driving scientific progress, eventually leading to the discovery of insulin, its function in the disease, and numerous other scientific breakthroughs (McCoy 2009).

Because of the time in diabetes was discovered, courses of treatment were created without much medical background knowledge. Greek physicians prescribed physical exercise as a course of treatment, and they preferred the patient ride on horseback to alleviate excess urination (Mandal 2019). Regular exercise can indeed help reduce blood sugar levels, but exercise is not enough on its own. In the 1870s, symptoms improved from war-time rationing, which led to the creation of the starvation diet based on repeated fasting and prolonged undernourishment to relieve patients of the symptoms—but not cure the disease (McCoy 2009). While severe fasting has since been found to reduce glucose (or sugar) levels in diabetics, the risks associated with starvation are far more hazardous than helpful (Mazur 2011). The fasting and undernourishment therapy was a delicate balancing act closely monitored by a specialist. Unfortunately, it often resulted in "backsliding" once the patient returned home and began eating as they usually would (Mazur 2011). For people who are average or underweight, the starvation diet can weaken the immune system, stunt growth in children, or result in death (Mazur 2011). However, Mazur (2011) reveals that "it is accepted today that calorie restriction is beneficial for diabetics who are overweight," which inspired a series of animal trials exploring this treatment method further. Physicians soon found that dietary changes could aid in the management of the disease and recommended diets consisting of only the fat and meat of animals or excess amounts of sugar, but Neal Barnard et al. (2009) insisted that animal fats cause diabetes and block cells' insulin receptors, thus they recommended alternative dietary solutions. Despite early Premature death was imminent despite early physicians' efforts to treat the disease using varying diets and exercises. However, in 1889, researchers Oskar Minkowski and Joseph von Mering demonstrated that removing a dog's pancreas could induce diabetes (McCoy 2009). The pancreas is now known as the organ responsible for insulin production and regulation. Pancreatic malfunction was found as the general cause of diabetes, though the specifics are still unknown. In 1921, Sir Frederick Grant Banting and Charles Herbert Best repeated the work done with the dog pancreas; along with their chemist, they purified the insulin from a cow pancreas, which uncovered an effective treatment for diabetes the following year (Mandal 2019). Although the discovery of insulin within the pancreas was a significant development treating diabetes, it is still considered a "band-aid" solution. Today's scientific advancement brings us closer than ever to discovering a more effective method.

With the discovery of insulin and modern technology came new ways to deliver insulin and new medications and procedures intended to treat and cure diabetes. In 1996, the FDA approved the first human synthetic insulin, Lispro (Humalog) (Higuera 2020). The makeup of this synthetic insulin has the same structure as insulin found naturally in the body. It is injected under the skin and works in about 15 minutes (Higuera 2020). The

natural structure and simple injection method make Lispro a slightly more effective alternative to the trending low- or no-carb diet methods. Unfortunately, Higuera (2020) notes that this option takes longer for the body to absorb because when injected, the medicine clumps together and is not processed as efficiently as natural insulin would be. Insulin analogs were then developed to help combat the issues arising from synthetic insulin. The analogs imitate the pattern of naturally released insulin and contain small amino acid changes that aid absorption (Hartman 2008). Insulin pumps were introduced around this time. These pumps attach to the skin and automatically pump insulin into the bloodstream (Hartman 2008). The discovery of synthetic insulin, insulin analogs, and insulin pumps started an easier, more flexible choice for treatment for people with Type 2 diabetes. However, these options become unnecessary with the adoption of the WFPB diet and the ultimate reversal of T2DM.

Surgical options began to arise that attempted to combat Type 2 diabetes as well. Bariatric surgery, like the starvation diet, is sometimes considered for overweight patients with T2DM. Because the surgery shrinks the stomach, it limits the calories absorbed (Z'graggen et al. 2008). Even though the surgery can sometimes normalize glucose levels, The American Diabetes Association does not accept it as a cure because patients after the surgery are still at risk for hyperglycemia (high glucose) to return (Z'graggen et al. 2008). Physicians and patients alike have begun rethinking dietary changes to combat diabetes. Trending, low-carb diets, such as paleo and keto, can help a person drop weight quickly. However, the effects can be harmful when used as a long-term T2DM treatment method (Panzarella 2016; Aspry et al. 2020). The keto diet is a low- or no-carb diet that makes blood sugar levels drop and makes the body break down fat to use as energy and has been found to improve insulin sensitivity in people with Type 2 diabetes (Aspry et al. 2020). Ketogenic diets restrict the fiber-rich foods associated with cardio protection, such as beans, legumes, whole grains, and starchy vegetables, and liberalize the consumption of animal proteins, processed meat, and dairy products (Aspry et al. 2020). By restricting the foods associated with lowering the risk of cardiovascular heart disease (CHD) and increasing the uptake of those associated with increased cardiovascular risk, adopting the Keto diet long-term can cause more harm than good (Aspry et al. 2020). Paleo is another diet trend intended to increase insulin sensitivity and stabilize blood sugars, but it is focused on whole, unprocessed foods—such as veggies, nuts, and fish (Panzarella 2016). This highly restrictive diet cuts out simple carbohydrates in processed foods like candy (Panzarella 2016). Simple carbohydrates are rapidly absorbed into the bloodstream, so eliminating them will slow absorption and stabilize glucose levels. However, more research on this dietary method is needed (Panzarella 2016). Panzarella (2016) reasons that following such low-carb diets while taking insulin or other blood sugar-regulating medications can put a patient at risk of having blood sugars dip too low. Today, insulin is still the primary treatment therapy for diabetes. However, despite trending diets, regular exercise, and other medications, there is still no cure" for this disease.

A "new," wildly effective dietary approach called the Whole Food Plant Based diet (WFPB) has recently been adopted by people with both type 1 and type 2 diabetes, and the results are astounding.

The WFPB diet eliminates all foods that cause insulin resistance, which can, over time, reverse Type 2 diabetes and ease symptoms of Type 1 diabetes. Although the WFPB diet can reverse T2DM, complications formed from years of unregulated insulin levels, such as diabetic neuropathy and retinopathy, cannot usually be undone, though they have rarely (McGoey-Smith et al. 2019). The WFPB approach boost insulins sensitivity significantly, and "insulin-dependent clients reduce their insulin use by an average of 35 percent in only four days, which then increases to an average of 45 percent reduced insulin use over six months" (Khambatta and Barbaro 2018). This method is superior to trending, low-carb diets because it causes the blood glucose levels to become more predictable instead of flatlining the levels by keeping them alarmingly low. The latter can increase insulin resistance and lead to hypertension, high cholesterol, coronary artery disease, and cancer—all are detrimental (Khambatta and Barbaro 2018). The WFPB diet can even increase blood flow to tissues throughout the body and can help prevent and reverse heart disease as well as diabetic neuropathy; the diet also lightens the burden carried by the kidneys because it cuts out all animal products, lessening the protein

content (Khambatta and Barbaro 2018). Some people with diabetes have even reported mental benefits from implementing the WFPB diet. Khambatta and Barbaro's (2018) clients reported "better sleep, better digestion, better mood…even increased happiness." Happiness may seem irrelevant, but it displays one more of the many positive attributes accompanying this diet. The WFPB diet also requires frequent meals and snacking. However, significant weight is still lost because the foods consumed are low in calories and high in nutrients (Khambatta and Barbaro 2018). While this information is thought to be relatively new, Dr. Joel Fuhrman alleges otherwise (Hall 2022). Rabinowitch (1935) demonstrated that a high-carbohydrate, low-calorie diet is more effective in controlling diabetes than all other methods. Essentially, Rabinowitch (1935) found the cure, but this information never took hold due to unknown reasons. So, it is scientifically plausible that a whole food, plant-based diet can completely reverse Type 2 diabetes and increase the quality of life for patients with Type 1 diabetes.

With diabetes on the rise and confusion due to conflicting information, most Americans are unsure how to cope with this diagnosis. Even after the discovery of the cure in the early 1900s and the availability of knowledge in today's time, there is still no need to be a clear direction in current treatment methods. WFPB has since been shown to prevent, treat, and reverse Type 2 Diabetes with no adverse side effects accompanying current medical treatments. Doctors and other health care specialists should be well-informed about the Whole Food Plant-Based diet to inform patients on an effective method. The closer someone can get to a WFPB diet, the lower the risk of T2DM and other comorbid diseases.

Literature Cited

American Diabetes Association. 2022. Statistics about diabetes. American Diabetes Association. [updated 2022 Jul 28; accessed 2023 Feb 28]. https://diabetes.org/about-us/statistics/about-diabetes.

Aspry KE, Kris-Etherton PM, Kirkpatrick C. 2020. Very low carbohydrate and ketogenic diets and cardiometabolic risk. Amer Coll Cardiol. [updated 2020 Oct 7; accessed 2023 Apr 6]. https://www.acc.org/latest-in-cardiology/articles/2020/10/07/13/54/very-low-carbohydrate-and-ketogenic-diets-and-cardiometabolic-risk.

Barnard N, Cohen J, Jenkins D, Turner-McGrievy G, Gloede L, Green A, Ferdowsian H. 2009. A low-fat vegan diet and a conventional diabetes diet in the treatment of type 2 diabetes: randomized, controlled, 74-wk clinical trial. Am J Clin Nutr. [updated 2009 Apr 1; accessed 2023 Feb 28]; 89(5):1588S-1596S. https://pubmed.ncbi.nlm.nih.gov/19339401/. doi: 10.3945/ajcn.2009.26736H.

Centers for Disease Control and Prevention (CDC). 2022. What is diabetes? [accessed 2023 Apr 11]. U.S. Dept Heal Hum Serv. https://www.cdc.gov/diabetes/basics/diabetes.html.

Culligan K. 2015. Diabetes: What the past tells us about the future. J Diab Adv Ther. 1(1): KDATOA-100101. [updated 2015 Nov 30; accessed 2023 Feb 28]. https://www.researchgate.net/profile/Kevin-Culligan/publication/285175889_Diabetes_What_the_Past_tells_us_about_the_Future/links/565c381608ae1ef92981d8e8/Diabetes-What-the-Past-tells-us-about-the-Future.pdf.

Greger M. 2018. How to reverse type 2 diabetes. [updated 2018 Sept 20; accessed 2023 Apr 11]. https://nutritionfacts.org/2018/09/20/how-to-reverse-type-2-diabetes/.

Hall H. 2022. Eat for life: Joel Fuhrman's nutritarian diet. [updated 2022 Jan 4; accessed 2023 Apr 11]. https://sciencebasedmedicine.org/eat-for-life-joel-fuhrmans-nutritarian-diet/.

Hartman I. 2008. Insulin analogs: impact on treatment success, satisfaction, quality of life, and adherence. Clin Med Res. [updated 2008 Sept 1; accessed 2023 Feb 28]; http://www.clinmedres.org/content/6/2/54.long#sec-9. doi: 10.3121/cmr.2008.793.

Higuera V. 2020. Diabetes: past treatments, new discoveries. [updated 2020 Jun 2017; accessed 2023 Feb 28]. Healthline Media UK Ltd, (Brighton, UK). https://www.medicalnewstoday.com/articles/317484.

Khambatta C, Barbaro R. 2018. The incredible benefits of a plant-based diet for people with type 1 diabetes. Forks Over Knives. [updated 2018 Jun 22; accessed 2023 Feb 28]. https://www.forksoverknives.com/wellness/plant-based-diet-benefits-for-type-1-diabetes/#gs.3f1r1l.

Mandal A. 2019. History of diabetes. News medical life sciences. AZoNetwork. [updated 2019 Jun 4; accessed 2023 Feb 2023]. https://www.news-medical.net/health/History-of-Diabetes.aspx.

Mayo Clinic Staff. 2008. Type 2 diabetes. [updated 2023 Mar 4; accessed 2023 Apr 11]. https://www.mayoclinic.org/diseases-conditions/type-2-diabetes/symptoms-causes/syc-20351193.

Mazure A. 2011. Why were "starvation diets" promoted for diabetes in the pre-insulin period? Nutr J. [updated 2011 Mar 11; accessed 2023 Feb 28]; 10(23): https://nutritionj.biomedcentral.com/articles/10.1186/1475-2891-10-23#citeas. doi: https://doi.org/10.1186/1475-2891-10-23.

McCoy K. 2009. The history of diabetes. everyday health. [updated 2009 Nov 3; accessed 2023 Feb 28]. https://www.everydayhealth.com/diabetes/understanding/diabetes-mellitus-through-time.aspx.

McGoey-Smith K, Esselstyn C, McGoey-Smith A. 2019. Reversal of pulmonary hypertension, diabetes, and retinopathy after adoption of a whole food plant-based diet. [updated 2019 Sept; accessed 2023 Feb 28]. https://www.researchgate.net/publication/350339606_Reversal_of_Pulmonary_Hypertension_Diabetes_and_Retinopathy_after_Adoption_of_a_Whole_Food_Plant-Based_Diet/citations. doi: http://dx.doi.org/10.22230/ijdrp.2019v1n2a41.

Panzarella A. 2016. Paleo for type 2? Pros and cons. WebMD. [updated 2016 Feb 16; accessed 2023 Feb 28]. https://blogs.webmd.com/from-our-archives/20160216/paleo-for-type-2-pros-and-cons.

Spero D. 2012. Meat and diabetes. Diabetes self-management. [updated 2012 Dec 5; accessed 2023 Feb 28]. https://www.diabetesselfmanagement.com/blog/meat-and-diabetes/?print=0.

Rabinowitch I. 2935. Effects of the high carbohydrate-low calorie diet upon carbohydrate tolerance in diabetes mellitus. Can Med Assoc J. [updated 1935 Aug; accessed 2023 Feb 28]; 33(2):136-144. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1561276/pdf/canmedaj00503-0060.pdf.

Z'graggen K, Guweidhi A, Steffen R, Potoczna N, Biral R, Walther F, Komminoth P, Horber F. 2008. Severe recurrent hypoglycemia after gastric bypass surgery. Obes Surg. [updated 2008 Apr 26; accessed 2023 Apr 11];18(8):981-988. doi: 10.1007/s11695-008-9480-4. https://pubmed.ncbi.nlm.nih.gov/18438618/#:~:text=Conclusion%3A%20Patients%20suffering%20from%20severe%20recurrent%20hypoglycemia%20after,Distal%20pancreatectomy%20should%20be%20considered%20a%20second-line%20treatment.

The Effect of Transactional and Transformational Leadership Styles of Supervisors on the Organizational Commitment of Employees

Kevin Oakley

Abstract

Recent shifts among the structure of organizations have affected workforce participants in all fields, ranging from customer service to educational personnel. With the rise of remote and hybrid work positions, it is necessary to study the leadership styles of supervisors and how these affect employees' level of commitment to an organization. The present study examines how transformational and transactional leadership styles differentially associate with affective, continuance, and normative organizational commitment of employees. A total of 53 participants responded to a questionnaire assessing the perceived leadership style of their direct supervisor. They also answered questions about their level of commitment to an organization. Results showed a statistically significance association between two leadership styles and three types of organizational commitment. The transformational leadership was associated with a greater number of employees endorsing a positive commitment with their organization. The results demonstrate that employees prefer to be intrinsically motivated to complete organizational tasks rather than extrinsically rewarded for task completion.

Keywords: Transactional leadership, Transformational leadership, Leadership Styles, Organizational Commitment.

Introduction

In the past 50 years, there has been extensive research conducted in the field of leadership studies (Yahaya & Ebrahim, 2016). Leadership is important because organizations are always striving to stay competitive (Keskes, 2014). With the shift in workplace structures to hybrid and remote positions, organizations need effective leadership to maximize efficiency, achieve organizational goals, and promote behaviors that bolster an employee's sense of organizational commitment. The term "leadership" varies in meaning and is broadly defined across the literature. Most definitions refer to the direction of an

individual (or group of individuals) towards a common goal. For example, Ejere and Abasilim (2013) define leadership as "a body of people who lead and direct the activities of a group towards a shared goal" (p. 31). Most of the literature concentrates on a predominant pair of leaderships styles: transactional and transformational leadership. The two concepts were first introduced by James M. Burns in 1978 with further development attributed to Bernard Bass and Bruce Avolio in 1990. Transactional leaders use extrinsic rewards such as money to motivate employees whereas a leader of the transformational style uses intrinsic rewards, such as personal development, to motivate employees.

The style in which leaders manage others can affect important domains, including an employee's commitment to the organization, their behaviors and attitudes, absenteeism, job satisfaction, performance, and turnover (Clinebell et al., 2013). As with "leadership", the definition of the term "organizational commitment" varies depending on the source. A commonality among these definitions is that organizational commitment is viewed as a general attitude the employee holds regarding their organization with special emphasis on their intentions to remain at the organization (Clinebell et al., 2013). An employee's commitment to an organization is important for a multitude of reasons. Employees with the highest organizational commitment tend to remain at their organizations (Allen & Meyer, 1990). Another reason organizational commitment is important is that it represents the overall leadership quality within the organization (Keskes, 2014). Several studies explore the link between leadership style and their employees' organizational commitment. A three-component framework by Meyer and Allen (1991) identifies three components of organizational commitment. These components consist of affective (emotion-driven), continuance (practicality-driven), and normative (obligation-driven) commitment. The current study will examine transactional and transformational leadership styles and their associations with employees' commitment to an organization.

Literature Review

Previous scholarly work on leadership has put forward many different characterizations, definitions, and theories into the domain of leadership. The present study focuses on the dominant conceptual framework, which categorizes leaders into the categories of "transactional" and "transformational". While there are also many more conceptual frameworks for examining organizational commitment, we will focus on the three-group approach, which distinguishes commitment into affective, continuance, and normative types.

In 2013, Clinebell et al. examined employees working at an information technology company in Lithuania. The study measured three specific leadership styles and their influence on of three organizational commitment levels. 184 employees participated in the study. Demographic data revealed that 50% of the respondents were male, 47% were female, and 3% declined to specify. Results showed that all three leadership styles positively impacted those employees that were affectively committed (i.e., emotionally connected) to the organization (Clinebell et al., 2013). In addition, employees with normative commitment to the organization tended to have transformational (rather than transactional) leaders. The transactional leadership style was found to significantly correlate with employees' intentions to stay at the organization. The overall results indicated that employees affectively and normatively committed to the organization were strongly influenced by leaders who exercised transformational leadership styles.

Wiza and Hlanganipai (2014) examined the impact of two leadership styles on three levels of organizational commitment among the academic staff of a South African University. A total of 160 people agreed to participate in the study. Demographic results of the self-administered questionnaires included 56% (n = 90) female and 44% (n = 70) male respondents. Data revealed that the

transformational leadership style positively influenced those employees with an affective or continuance organizational commitment. Those with a normative organizational commitment were not influenced by leaders displaying the transformational style. A weak but positive relationship was found between leaders of the transactional leadership style and employees that identified as being morally obligated to the organization. No relationship was found among employees with an affective or continuance commitment and leaders of the transactional leadership style.

In a 2018 study, Mulugeta and Hailemariam assessed the perceived leadership style of employee leaders among an administration staff in Ethiopia. They studied the influence of each of the three leadership styles on its level of organizational commitment by employees of the governmental agency. In total, 570 people agreed to participate. The researchers used descriptive research to test five subcategories of transformational leadership styles, three subcategories of transactional leadership style, along with an additional unrelated leadership style. Three categories of employee commitment were also measured during the study. According to the results, the administration's leadership style tended to be transformational rather than transactional (Mulugeta & Hailemariam, 2018). Results also show that employees of the administration were primarily affective in their commitment to the public sector organization.

Abasilim et al. (2019) conducted a study among employees of a Nigerian State Civil Service Commission to examine the relationship between supervisor leadership styles and their influence on the commitment of employees within the agency. 97 people participated in the study. The results of the self-administered questionnaires showed that leaders who exercise the transformational leadership style tended to have a positive level of commitment from the agencies' employees. Specific to the commission's employees, there was a moderate and positive relationship between the transformational behaviors of leaders and the commitment of the employees. The results also show that a small, but negative, relationship exists among leaders who exercise the transactional leadership style and its influence on organizational commitment of the employees.

In 2020, Tafesse and Mohammedhussen studied the academic staff of Madda Walabu University. One-hundred ninety-two people participated in the study. Data analysis revealed that the sample was composed of 22 leadership respondents and 170 faculty respondents. The study examined three styles of leadership and its relationship to one of three organizational commitment domains. Results indicate that leaders exercising the transformational leadership style tended to have higher levels of organizational commitment from their employees. Results also suggested a weak but positive relationship among leaders who practiced the transactional leadership style and their influence on organizational commitment.

In a more recent study, Hai et al. (2022) examined whether principals' leadership style impacted faculty member's commitment to a political school in Vietnam. The researchers hypothesized that principles using a transformational style would have greater levels of organizational commitment from their subordinates. Results confirmed this hypothesis.

The current study reviews the literature to understand the relationship between leadership style and organizational commitment of employees. This research is important for motivating employees, developing their skills, and preventing high turnover rates in organizations.

Method

Participants

Participants in this study were recruited by convenience sampling via an electronic communication that included e-mail and social media messaging. Prospective

participants were provided a link to access the survey. This sampling process resulted in 53 participants. 75.47% of these participants were employed full-time, 15.09% were full-time students, 7.55% work part time, and 1.89% work as homemakers. The participants worked in a large variety of fields, including banking, healthcare, retail, tutoring, and law enforcement.

The average age of the participants was 33.17 (SD = 10.44). Participants were 67.92% female, 26.42% male. 5.66% chose not to specify. 54.72% of participants were African-American, 33.96% were European-American, 3.78% were American Indian or Alaskan Native, 1.89% were Hispanic, 1.89% were Asian, and 3.78% chose "Other". The full demographic questionnaire can be found in Appendix C.

Materials

Participants were provided with informed consent forms for signature that included all information pertaining to the study. Details of the form included the purpose of the study, research methods and procedures, participant right to withdraw, potential risks and benefits, and incentives for participation. A statement of confidentiality was provided within the form details. For respondent convenience, the questionnaires were self-administered. The survey questionnaire consisted of 25 items. Participants were asked to select the appropriate response to each question item posed.

Following Bass and Avolio (1992), the Multifactor Leadership Questionnaire was used to measure the leadership variables in this study (see Appendix A). The questionnaire is composed of a 25 item, four-point Likert scale to measure the participant's response to questionnaire items. Ten items measured the perceived leadership style of the respondent's direct supervisor, and 15 items measured the identification of an organizational commitment type among employees. The questionnaire contains five items that are associated with the transformational leadership style, and five items that are associated with the transactional leadership style. The scale for measuring leadership styles ranges from 1-4, where 1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly agree. The dependent variable of the study was measured by the Three-Component Model Organizational Commitment Questionnaire by Meyer and Allen (1997) measured the dependent variable (see Appendix B). This questionnaire contains five items associated with affective commitment, five items associated with continuance commitment, and five items associated with normative commitment. The scale for measuring employee organizational commitment levels ranges from 1-4, where 1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly agree.

Procedure

Participants provided informed consent of voluntary participation in completing the online assessment. No monetary or material reward or incentive were provided for participation in the study. Participants received a message of gratitude thanking them for their participation in the study upon submission of questionnaire responses.

Results

The present study sought to examine the associations between leadership style and employee's organizational commitment. A total of five variables were measured: perceived degree of transformational leadership style from one's immediate supervisor, perceived degree of transactional leadership style from one's immediate supervisor, one's degree of affective, continuance, and normative commitment to their organization. Results in Table 1 show that most supervisors were perceived as having more of a transformational leadership style (M = 15.42, SD = 3.08). Ratings of transactional leadership were lower (M = 13.75, SD = 2.56).

Table 1. Descriptive Measures of Leadership Style Variables (Mean and Standard Deviation)

Leadership Style	M	N
Transformational Leadership Style	15.42 (SD = 3.08)	37
Transactional Leadership Style	13.75 (SD = 2.56)	16

Note. $N = 53$

Ratings of affective commitment were highest ($M = 13.98$, SD, $= 3.29$) compared to ratings of normative ($M = 13.45$, $SD = 2.34$) and continuance ($M = 12.94$, $SD = 2.49$) organizational commitment (see Table 2).

Table 2. Descriptive Statistics for Organizational Commitment (Mean and Standard Deviation)

Organizational Commitment	M	N
Affective Commitment	13.98 (SD = 3.29)	23
Continuance Commitment	12.94 (SD = 2.49)	17
Normative Commitment	13.45 (SD = 2.34)	13

Note. $N = 53$

To understand how leadership style (Transactional or Transformational) is related to organizational commitment (Affective, Continuance, and Normative), we conducted a chi-square test of independence (see Table 3). Each participant's supervisor was categorized as primarily transactional or transformational depending on which of the two ratings were higher. A similar procedure was used to determine each participants primary reason for staying committed to their organization.

Table 3. Chi-Square Results

Leadership	Affective	Continuance	Normative	Row Total
Transactional	3 (6.94) [-2.8]	6 (5.13) [0.56]	7 (3.92) [2.14]	16
Transformational	20 (16.06) [2.38]	11 (11.87) [-0.56]	6 (9.08) [-2.14]	37
Column Totals	**23**	**17**	**13**	**53**

Note. Cells contain the following information: the observed cell totals, (the expected cell totals) and [the standardized residuals for each cell].

The results were statistically significant, X^2 (2) = 6.90, p = .032. This suggests that a supervisor's perceived leadership style is statistically dependent on employees' organizational commitment. Specifically, transformational leadership styles were associated with a greater number of affective organizational commitment types and fewer normative commitment types. Transactional leaders showed the opposite effect. A greater number of employees belonged to the normative commitment category whereas fewer belonged to the affective category.

Results show 70% of leaders were measured as having the transformational leadership style and 30% of leaders as having the transactional leadership style. Furthermore, results show that 43% (n = 23) of respondents were affectively committed to their organization. A 20:3 proportion of those affectively committed identified their supervisor's leadership style as the transformational leadership style and transactional leadership style, respectively. A total of 32% (n = 17) of respondents identified that they are continually committed to their organization. Of those continually committed, a 11:6 proportion of respondents identified their supervisor as having the transformational and transactional leadership style, respectively. Results also show that the normatively committed employees 25% (n = 13), a relatively equal proportion of 7:6 identified their supervisor as having the transactional and transformational leadership style, respectively.

Discussion

The results of the current study show a statistically significant association between a direct supervisor's leadership style and the organizational commitment of their subordinates. Transformational leaders tended to have employees with an affective organizational commitment whereas transactional leaders tended to have employees with more normative organizational commitment. The transformational leadership style was most strongly associated with employees having an emotional connection to their organization. The transformational style also had an association with employees identifying as having an economical benefit commitment to their organization. The transactional leadership has a slightly stronger association with employees experiencing a moral commitment to an organization than the other commitment types.

Limitations

Time constraints in collecting responses is one of the limitations of the current study. The response rate of participants of the study (n = 53) was lower than anticipated. This may underrepresent some of the service industries that were reported in the demographic data. The limited access in recruiting voluntary participation serves as an additional limitation of the study. With the instruments being self-administered, authenticating the quality of the responses also limits the study. It is also worth noting that the present study is correlational. We cannot necessarily infer that leadership styles are causing differences in organizational commitment. The case could always be made that leaders adopt a leadership style that matches the organizational commitment of employees rather than the other way around.

Future Research

Future research would benefit from a larger sample of participants. It would also be useful to recruit participants from a greater variety of career types. Using a controlled environment for participants may also be beneficial in obtaining authentic responses from participants. Researchers may also benefit from the use of structured recruitment events to obtain participants. With the employment structure of many companies changing their standards of practice post-pandemic, organizational researchers may be able to benefit in areas such as turnover by periodically measuring the organizational commitment of their employees. Using the commitment of employees, organizations may identify the effectiveness of its' management staff and make the necessary adjustments to produce longevity in front-line employees. Findings in this area of research, as newer generations begin to join and participate in the workforce, may be critical for the future success for organizations in many fields of service industries.

References

Abasilim, U.D., Gberevbie, D.E., & Osibanjo, O.A. (2019). Leadership styles and employees' commitment: Empirical evidence from Nigeria. SAGE Open, 9. https://doi.org/10.1177/2158244019866287.

Allen, N.J. & Meyer, J.P. (1990). The measurement and antecedents of affective, continuance and normative commitment in organizations. Journal of Occupational Psychology, 63(1), 1-118. https://doi.org/10.1111/j.2044-8325.1990.tb00506.x.

Bass, B. M. & Avolio, B. J. (1990). Transformational Leadership Development: Manual for MLQ. Palo Alto: Consulting Psychologist Press.

Burns JM (1978) Transformational leadership theory. Leadership. New York: HarperCollins.

Clinebell, S., Skudiene, V., Trijonyte, R., & Reardon, J. (2013). Impact of Leadership Styles on Employee Organizational Commitment. Journal of Service Science, 6(1), 139–152. https://doi.org/10.19030/jss.v6i1.8244.

Clinebell, S., Skudiene, V., Trijonyte, R., & Reardon, J. (2013). Impact of leadership styles on employee organizational commitment. Journal of Service Science (JSS), 6(1), 139–152. DOI: https://doi.org/10.19030/jss.v6i1.8244.

Ejere, E. I., & Abasilim, U. D. (2013). Impact of transactional and transformational leadership styles on organizational performance: Empirical evidence from Nigeria. Journal of Commerce, 5(1), 30-41.

Hai, N.T., Van, Q. N., & Tuyet, M. N. (2022). An empirical study of principals' leadership styles with faculty commitment. Emerging Science Journal, 6(3), 603–618. https://doi.org/10.28991/esj-2022-06-03-013.

Keskes, I. (2014). Relationship between leadership styles and dimensions of employee organizational commitment: A critical review and discussion of Future Directions. Intangible Capital, 10(1). https://doi.org/10.3926/ic.476.

Meyer, J.P. and Allen, N.J. (1991) A three-component conceptualization of organizational commitment. Human Resource Management Review, 1, 61-89. https://doi.org/10.1016/1053-4822(91)90011-Z.

Mulugeta A., Hailemariam E. (2018). Employees' perception towards leadership style and organizational commitment in public organizations. International Journal of Scientific and Research Publications, 8, 354-365. http://dx.doi.org/10.29322/IJSRP.8.6.2018.p7846.

Tafesse, A. B., & Mohammedhussen, M. I. (2020). The impact of leadership styles on employee commitment in Madda Walabu University. African Journal of Business Management, 14(9), 291–300. https://doi.org/10.5897/ajbm2018.8603.

Wiza, M., & Hlanganipai, N. (2014). The impact of leadership styles on employee Organisational commitment in Higher Learning Institutions. Mediterranean Journal of Social Sciences, 5(4). DOI: https://doi.org/10.5901/mjss.2014.v5n4p135.

Yahaya, R., & Ebrahim, F. (2016). Leadership styles and organizational commitment: Literature review. Journal of Management Development, 35(2), 190–216. https://doi.org/10.1108/jmd-01-2015-0004.

Appendix A

Leadership Style Questionnaire Items

Instructions. The first part of the questionnaire provides 10 statements that represents the transformational and transactional leadership styles. Select your level of agreement with the statement as relates to your direct leader. The word "others" may mean your followers, clients, or group members.

Response Key: 1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly agree.

01. My leader manages on an exchange basis (performance = reward).	1	2	3	4
02. My leader welcomes criticisms provided they are appropriate.	1	2	3	4
03. My leader tends to focus on complete compliance of written standards.	1	2	3	4
04. My leader helps me to develop my skills, and abilities.	1	2	3	4
05. My leader rarely, if at all, deviates from the pre-established rules.	1	2	3	4
06. My leader demonstrates confidence in his/her team members.	1	2	3	4
07. My leader monitors my task completion, not my professional development.	1	2	3	4
08. My leader looks at different perspectives in solving problems.	1	2	3	4
09. My leader may say, "If it's not broke, don't fix it" to changes.	1	2	3	4
10. My leader considers employees aspirations.	1	2	3	4

Appendix B

Organizational Commitment Questionnaire Items

Instructions. The second part of the questionnaire provides 15 statements that represent different levels of employee commitment to an organization. To the best of your ability, please select your level of agreement with the statement as it relates to your level of organizational commitment.

Response Key: 1 = strongly disagree; 2 = disagree; 3 = agree; and 4 = strongly agree.

01. I can see myself with my current organization for the rest of my career.	1	2	3	4
02. I enjoy discussing my organization with other people.	1	2	3	4
03. I feel I have an emotional connection with my current organization.	1	2	3	4
04. I do not feel a strong sense of belonging to my current organization.	1	2	3	4
05. I do not have an emotional attachment to my current organization.	1	2	3	4
06. Leaving my organization would be hard, even if I wanted to.	1	2	3	4
07. I feel there are slim options for leaving my current organization.	1	2	3	4
08. Staying with my current organization is about necessity, not desire.	1	2	3	4
09. Quitting without another job already lined up is not a concern of mine.	1	2	3	4
10. It wouldn't be too costly to leave my current organization.	1	2	3	4
11. I think individuals move from company to company too often these days.	1	2	3	4
12. I feel I have an obligation to fulfill with my current organization.	1	2	3	4
13. My organization deserves my loyalty.	1	2	3	4
14. I do not feel an obligation with my current organization.	1	2	3	4
15. Being a "company person" is not sensible these days.	1	2	3	4

Appendix C

Demographic Information

01. Please indicate your current employment status.
a) Full-time
b) Part-time
c) Unemployed/not working
d) Homemaker
e) Retired
f) Student

02. Please enter your age.
a) (Enter age)

03. Please select your ethnicity from the following list.
a) African American/Black
b) American Indian/Alaska Native
c) Asian
d) Caucasian
e) Hispanic or Latino
f) Other
g) Prefer not to answer

04. Please indicate your marital status
a) Single
b) Married
c) Widowed
d) Divorced

05. Please select your highest level of education.
a) High school diploma/GED
b) Technical diploma/certification
c) Associate Degree
d) Bachelor's Degree
e) Master's Degree
f) Ph.D. or professional degree

06. Please select your gender.
a) Male
b) Female
c) Other
d) Prefer not to say

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How Sawmill Towns Helped Industrialize the New South, 1865 – 1910

Christian Singletary

Abstract

The destruction from the Civil War left the southern United States in shambles. The South's economy and ravaged agriculture left people scrambling for any opportunity to make some sort of profit in the under-industrialized New South. In 1876, the United States Congress began selling around forty million acres of federally owned land to the public, which invigorated the lumber industry. Between 1865 and 1910, many new lumber companies opened and began purchasing virgin forest land, birthing many sawmill towns across the New South. Many of these towns were established in an area where large amounts of timber could be harvested. Most companies moved to a new location after just a stumpscape was left. Mass deforestation worried the federal government as timber was cut faster than it could be regrown, which could have led to an eventual loss in revenue. However, new industries began investing in land cleared by lumber companies, such as mining operations and naval stores, helping the New South transition to an industrialized society. The new communities established helped the United States government and outside investors develop new economic interests in the South, which created new possibilities for economic gain. The massive growth of the lumber industry in the New South also encouraged new research methods that helped create sustainable forestry across the United States; thus, creating a sustainable lumber industry.

The American Civil War caused political and economic turmoil across the continental United States. Between 1860 and 1865, the Confederate States of America developed their own government and economy that collided with the way the United States of America government operated. In 1865 when the Confederacy collapsed, the established agrarian society of the South was decimated, and the South lagged behind the North in modernizing into an industrial society. The people of the South scrambled for employment to remain economically backwards, and the people of the North sought new jobs in the expanding fields of industry as the Second Industrial Revolution began. Many people looked to the lumber industry for employment, but work was sparse as much of the locally owned land was burned or torn apart by the war. In 1876, the federal government opened around forty million acres of federally owned virgin forest land for public use, causing lumber companies and tenant farmers to quickly begin purchasing land. The availability of land reinvigorated the lumber industry in the New South due to the vast frontier of timber lands now accessible. The lumber industry grew exponentially

as a business, but also created new jobs for millions of people, newly established towns in the forest land, and new developments of research on creating sustainable forestry nationwide.

Before 1860, public lands in the South were open for public entry and use, which allowed for early lumber companies to take hold in the South. The lumber industry was in a form of stasis due to the slow process of purchasing land and sending laborers to harvest timber by hand. However, on June 21, 1866, the federal government closed off public access to federally owned land with the Homestead Act of 1866.[1] The Homestead Act of 1866 was created so that the federal government could centralize the sale of land and regulate the prices that the land was being sold for to possibly break the debt the South was facing. As Reconstruction was being enforced across the South, whites and blacks were applying to purchase land due to tenant farming, and sharecropping being an established way of earning capital at the time. Even after the Civil War, racial tensions impeded the ability of southern whites and blacks to buy land. The Homestead Act of 1866 was a way for the federal government to centralize this process and attempt to ease the process of purchasing land, but the economically poor southerners still could not afford land and the federal government lost capital from this act. When the federal government saw that the Homestead Act of 1866 was not boosting the South's economy, the Timber Culture Act was passed on March 3, 1873.[2] The Timber Culture Act was passed as a follow-up act to the Homestead Act of 1866 before the Homestead Act was repealed. The Timber Culture Act was aimed towards helping afforestation in the Great Plains, but allowed homesteaders in the South to reap the same benefits the act offered. Under the Timber Culture Act, homesteaders could obtain an extra one hundred and sixty acres of land with their land purchase if they agreed to plant trees on one fourth of the land. The Timber Culture Act had multiple legal loopholes and no overall enforcement, so national newspapers began criticizing the act, causing Congress to question the act and begin investigating many of the land claims.[3] In June of 1876, the Homestead Act of 1866 was officially repealed before much land was distributed from this act, and the Timber Culture Act was repealed in 1891. Even with the multiple repeals of forestry-oriented legislation, the federal government did not lose interest in the South's increasing industrial capabilities.

The exponential growth of timber industry nationwide defined the post-Civil War Era due to the Second Industrial Revolution and westward expansion. The Second Industrial Revolution is widely remembered for the explosion of the Andrew Carnegie's steel industry, John D. Rockefeller's oil industry, J.P. Morgan's banking financial industry, and other trust giants at the time.[4] However, the lumber industry had been around for longer than any of the other industries booming during the revolution, and the lumber industry was not absent from the business growth of the late nineteenth century. Timber fueled many aspects of every-day life in America, such as the construction of homes and businesses, shipbuilding, and railroads. In 1865 though, America was still expanding westward, and many of the larger urban areas were in the northern part of the nation. The lumber industry did not set up operations in locations near large urban areas like the steel or oil industries did; the lumber industry moved throughout the nation to access forested areas. After 1876, the lumber was established as being an ever-expanding industry, and many young men would be attracted to the industry as it gave those who were employed a wage, an opportunity to travel, and as a means to establish new homes away from war-torn cities in the South. The South did not have as many developing urban areas as the North, but the number of small communities and cultures established during this period boosted the lumber industry beyond the unionized labor of northern industries.

The southern coastal states of Texas, Louisiana, Mississippi, Alabama, and Florida were dense with cypress and yellow pine trees during the late nineteenth century before mass harvesting moved into the region. These specific species of tree were not as desirable in the late 1870s and 1880s as they were specified as softwood compared to hardwoods like oak, elm, or hickory trees. Hardwood made up the outside of a constructed building while softwood was used to construct the interior of buildings due to their malleability. Much of the land that was opened for purchasing in 1876 was in the South and had dense virgin forests of yellow pine and cypress available. The forty-six million acres of federally owned land that Congress made available for purchase in 1876 after repealing the Homestead Act of 1866 was in multiple deep South states: Alabama, Florida, Mississippi, Louisiana, Arkansas, and East Texas. The minimum price set for these vast lands was $1.25 an acre.[5] The established low minimum price caused land

speculators throughout the nation to travel to the Gulf states and purchase ample amounts of available land. Many land speculators from the North travelled south to inspect the lands, even outnumbering the amount of land speculators who were from the region. Once land speculators purchased land, lumbering operations were established across the South to meet a growing national demand for lumber. To meet the national demand though, owners of lumber companies struck deals with railroad companies or shipping companies to ship lumber nationwide. Ultimately in the 1890s, the national demand for lumber would surpass the demand from other industries such as the stone industry or steel industry based on low prices.[6] The poor working conditions of harvesting and milling lumber was comparable to the working conditions in other industries, but the start-to-finish process of processing lumber was far faster than the other industries. The hastiness of the lumber industry was a reason for the quick industrial development of the New South.

Once lumber companies began establishing foundations in southern states, it did not take long for employment-seeking southerners to start applying for jobs in the expanding lumber industry. Most of the people in the South in 1880, regardless of their skin color, were poor and many of the cities and towns those people lived in were still recovering from the Civil War. The North had booming industries and expanding urban areas while the South largely remained an agrarian society. Railroads connected the industrializing North to the poor South, but the people living in southern states did not have access to jobs in the steel or oil industries without having to travel north. With the lumber industry taking off primarily in the southern states, people living in the South did not have to travel to the North to obtain employment in a growing industry. There were lumber operations in the North, such as the white pine empires in Michigan, but most newly opened lumber operations in the late nineteenth century were in the South.[7] Southern lumber companies took advantage of the vast forests of the South to create rapidly expanding and low-cost operations, which lead to a further growth in the lumber industry deeper into the southern frontier.

Naval stores corporations already had a small foothold in the South by the late nineteenth century, extracting resinous tree gum from pine trees, otherwise known as turpentining. The turpentine and other tree gum that was extracted was one of America's first forest-based products to be exported to England.[8] Once lumber companies started cutting into the South's forests, the already established naval stores corporations followed the aggressive harvesting of lumber operations across the Gulf South states into the vast lands of old growth and stumps. Unlike many of the other industries of the time, the lumber industry could not stay in the same location for at most twenty-five years.[9] With over forty million acres made available in Congress's 1876 decision on making southern land purchasable, lumber companies could cut timber down until just a stumpscape was left, then move to a different location that the company owned to continue to cut timber. Clear cutting resulted in the southern landscape dotted with abandoned lumber mills with no forest around them, resulting in deforestation. Naval stores corporations were able to begin research on using leftover stumps to create naval stores products.[10] The lumber industry worked in tandem with the still expanding railroad industry, shipping industry, and the smaller naval stores industry to maximize outreach and growth at the turn of the century. Railroad logging, lumber depots, and communities hastened the output of timber and increased the national interest of new investors and workers.

With the expansion of the lumber industry sweeping across the South and more people flocking to work for lumber companies, more and more towns were established around lumber mills. With mills being established for more than a decade in the same location, workers did not live in hastily built homes for long periods of time. Well-constructed homes were built around lumber mills, creating small communities called sawmill towns. Before 1910, America had not yet moved to the common use of automobiles, so travelling in the nineteenth century was not common. The people who made up these sawmill towns staying within the community allowed for large cultural and social developments. Many of these communities were recognized both federally and by the states in which they resided, allowing for sawmill towns to set up registered post offices.[11] Sawmill towns had other amenities that started quickly after the town was established, such as barber shops, general stores, and doctor's offices. Some sawmill towns endured after the lumber mill shut down, leading to other long-term amenities being added to the town, such as schools and commissaries. However, not all sawmill communities became established towns. Some became abandoned when the mill was abandoned

due to workers following the mill operation and not staying in the same area. With numerous communities being established across the Gulf South withing just a few decades after the Civil War, the federal government took special interest in funding the lumber industry so that more communities would be established, and the economy of the New South would grow. The large supply of lumber that the South was producing met the national demand and attracted outside investors to the lumber industry, thus boosting the United States economy as a whole. The "Golden Age of Lumbering," a name given to the 1870s-1910s for the mass growth of the lumber industry and economic growth, continued to grow an empire of sawdust and stumps.[12]

The lumber industry grew into the early 1900s, resulting in more mills abandoned in cutover lands and new mills would pop up in virgin forest land. Deforestation began to become a serious problem nation wide not only due to the lumber industry, but the United States western expansion, development of new urban areas, and the overwhelming expansion of every industrial field during the Second Industrial Revolution. The lumber industry's use of railroads in the flat land of yellow pine forests in the South allowed for heavy logging equipment to be used to mechanize the process of harvesting lumber. Log skidding and loading equipment were widely used on railroads by lumber operations to move large amounts of lumber through forests back to the sawmill. Railroading and cutting timber resulted in millions of acres of cutover forests with no plan to reforest the lands. Political attention was soon drawn to the stumpscapes left behind after lumber operations moved through the forestland. The Second Industrial Revolution birthed new reformers in the environmentalists.[13] Newly elected President Theodore Roosevelt identified himself as an avid outdoorsman and he paired with early environmentalists such as Gifford Pinchot and John Muir attempted to slow down or stop mass pillaging of natural resources. Roosevelt took the executive standpoint and created one hundred and twenty-five million acres of federal reserves, while other environmentalists and naturalists took to the printing presses to reach people through literature. While none of the national reservations established by President Roosevelt were in the Gulf South, environmentalist literature did reach southern people. In the 1930s and 1940s, seeding began in the South designed to replace the depleted population of tree species such as longleaf pines that dwindled in the 1880s and 1900s. Conservation methodologies were not as present in the Gulf South states during the period when the lumber industry was expanding. The primary focus at the time was expanding industry and earning profit, which left forestlands poorly taken care of. Researchers and environmentalists were able to take advantage of the vast stumpscapes to boost their research development to pave the way for later methods of sustaining forests.

The introduction of mechanized equipment into the lumber industry and into the forests of the South meant that forestland would be cut much faster than the surrounding natural landscape could keep up. More lumber being cut and sent to the mills meant more work and pay for the workers employed at the sawmills, but it also meant that the 'cut-out and get-out' method would become more apparent in sawmill towns. In large lumber operations, mill owners were seldom loyal to their workers. Once the surrounding landscape was cutover, mill owners promptly relocated to new forestland because staying in the same location with no access to large amounts of timber was not profitable enough. If the workers had not built up a community surrounding the sawmill, they could seek employment with a new lumber operation or follow the same owners to the next plot of land. However, if a sawmill town was established, some workers stayed to continue to build up their community instead of following the industry. Many of these sawmill towns established in the late nineteenth century and early twentieth century still exist today, such as the town of Long Leaf in Louisiana. The Crowell & Spencer Lumber Company established the sawmill town of Long Leaf, Louisiana in 1893 and employed three hundred workers. The Crowell & Spencer Lumber Company built railroads to many nearby towns and into the surrounding forestland so that timber could be harvested. The sawmill town of Long Leaf expanded into the village known as Forest Hill, Louisiana in the twenty-first century. The perseverance of the lumbermen at Long Leaf and at sawmill towns throughout the Gulf South helps establish a foundation for how the lumber industry influenced the agrarian South to transition to an industrial economy into the twentieth century. Even though the South had begun transitioning to an industrial society, it would not become a match the industrial society that the North had become. The northern United States at this time felt the effects of the steel and oil industries reigning supreme, while the South transitioned to a hybrid society that

still gained profit from agriculture, but also was fueled by the lumber industry boosting the economy state-by-state.

Between 1865 and 1910, the lumber industry evolved from a small, partitional business to a steaming economic giant in the New South. In 1876 when the United States Congress opened over forty million acres of virgin forestland for purchase in the South. The lumber industry and clear cutting resulted in an experiments and reforms to create a more sustainable, long-term industry. The lumber industry steamed through the vast pine forests of the South and attracted international attention due to the increased supply of lumber overwhelming the demand of the time. After 1910, the lumber empires of the South declined due to the dwindling amount of forest land and the now vast stumpscapes. Throughout the growth of the lumber industry though, research began on how to create seeding methods to solve the case of deforestation eventually evolving to create sustainable forestry. Forestry was a leading industry during the late nineteenth century, even expanding further after the introduction of mechanization into the industry, and it remains to be a largely influential into the twenty-first century. The United States' dependency on lumber has fluctuated throughout American history, but the demand will always be present as the nation's population and international trade expands. Sawmill towns across the United States carry the truth that the lumber industry helped develop the South into a uniquely cultural and economically diverse region, defining a foremost difference from the North.

Notes

[1]Paul Wallace Gates, "Federal Land Policy in the South 1866-1888," JSTOR.org (Journal of Southern History Vol. 6, No. 3, August 1940), pp. 303-305. https://doi.org/10.2307/2192139.

[2]C. Barron McIntosh, "Use and Abuse of the Timber Culture Act," JSTOR.org (Annals of the Association of American Geographers Vol. 65, No. 3, September 1975), pp. 347-350. https://www.jstor.org/stable/pdf/2561886.pdf.

[3]Ibid, pp. 353-357.

[4]David M. Kennedy and Lizabeth Cohen, "Chapter 22 - The Industrial Era Dawns, 1865-1900," in The American Pageant: A History of the American People, Seventeenth, vol. 2: Since 1865 (Boston, MA: Cengage, 2020), pp. 504-506.

[5]James P. Barnett and Everett W. Lueck, Sawmill Towns: Work, Community Life, and Industrial Development in the Pineywoods of Louisiana and the New South (Asheville, NC: United States Department of Agriculture, Forest Service, Research and Development, Southern Research Station, 2020), pp. 3

[6]Compton, Wilson. "The Price Problem in the Lumber Industry." The American Economic Review 7, no. 3 (1917): 582–583. http://www.jstor.org/stable/1809719.

[7]Rolland Harper Maybee, Michigan's White Pine Era, 1840-1900, 2nd ed. (Lansing, MI: Mich. Hist. Div., Mich. Dept. of State, 1988).

[8]James P. Barnett and Everett W. Lueck, Sawmill Towns: Work, Community Life, and Industrial Development in the Pineywoods of Louisiana and the New South, pp. 4-11.

[9]Thad Sitton and James H. Conrad, "Chapter Six - Cut and Get Out," in Nameless Towns Texas Sawmill Communities, 1880-1942 (Austin, TX: University of Texas Press, 1998), pp. 192-194.

[10]Barnett and Lueck, Sawmill Towns: Work, Community Life, and Industrial Development in the Pineywoods of Louisiana and the New South, pp. 5-6.

[11]Ibid, pp. 34-35.

[12]Ibid, pp. 19, 35.

[13]Kennedy and Cohen "Chapter 28 – Progressivism and the Republican Roosevelt, 1901-1912" in The American Pageant: A History of the American People, pp. 662-665.

Bibliography

Barnett, James P., and Everett W. Lueck. Sawmill Towns: Work, Community Life, and Industrial Development in the Pineywoods of Louisiana and the New South. Asheville, NC: United States Department of Agriculture, Forest Service, Research and Development, Southern Research Station, 2020.

Belissary, Constantine G. "The Rise of Industry and the Industrial Spirit in Tennessee, 1865-1885." The Journal of Southern History 19, no. 2 (1953): 193–215. https://doi.org/10.2307/2955013.

Compton, Wilson. "The Price Problem in the Lumber Industry." The American Economic Review 7, no. 3 (1917): 582–97. http://www.jstor.org/stable/1809719.

Donald J. Millet. "The Lumber Industry of 'Imperial' Calcasieu: 1865-1900." Louisiana History: The Journal of the Louisiana Historical Association 7, no. 1 (1966): 51–69. http://www.jstor.org/stable/4230882.

Fricker, Donna. "Historic Context the Louisiana Lumber Boom, C.1880-1925." Docslib. Fricker Historic Preservation Series LLC. Accessed February 24, 2023. https://docslib.org/doc/3990285/1-historic-context-the-louisiana-lumber-boom-c-1880-1925-donna.

Gates, Paul Wallace. "Federal Land Policy in the South 1866-1888." The Journal of Southern History 6, no. 3 (1940): 303–30. https://doi.org/10.2307/2192139.

Kennedy, David M., and Lizabeth Cohen. The American Pageant: A History of the American People. 2: Since 1865. Seventeenth ed. Vol. 2: Since 1865. 2 vols. Boston, MA: Cengage, 2020.

Maybee, Rolland Harper. Michigan's White Pine Era, 1840-1900. 2nd ed. Lansing, MI: Mich. Hist. Div., Mich. Dept. of State, 1988.

McIntosh, C. Barron. "Use and Abuse of the Timber Culture Act." Annals of the Association of American Geographers 65, no. 3 (1975): 347–62. http://www.jstor.org/stable/2561886.

Oubre, Claude F. "'Forty Acres and a Mule': Louisiana and the Southern Homestead Act." Louisiana History: The Journal of the Louisiana Historical Association 17, no. 2 (1976): 143–57. http://www.jstor.org/stable/4231584.

Sitton, Thad, and James H. Conrad. Nameless Towns: Texas Sawmill Communities, 1880-1942. Austin, TX: University of Texas Press, 1998.

Book Review

Monster: The Autobiography of an L.A. Gang Member

By Sanyika Shakur. Grove Press.
July 29, 2004. New York, New York. 978-0-8031-4144-6. 383 pp. $12.49.

Emrie Albritton

Sanyika Shakur shares a lifetime of violence, tragedy, and redemption in his book *Monster: The Autobiography of an L.A. Gang Member*. The author conveys his experiences as Monster Kody Scott, the name he began to be known by after his initiation into the Crips gang. This book is a valuable resource for anyone interested in gaining insight into criminology, gang culture, or how socioeconomic factors perpetuate criminal behavior.

This book tells the hard truths of poverty, gangs, and violence without shying away. Through the uncensored account of his journey, Shakur shows readers that it is possible to overcome obstacles and an already damaged life to become better and more honorable, why this is important, and what can result. At eleven years old, Kody was initiated into the Crips. As an ever more hardened gang member, he lived a life of brutality and harm outside the law. He was arrested on multiple charges of theft, drug related crimes, and murder. After thirteen years of this life of violence and frequent crime, he converted to Islam and began a movement that shed light on the underlying causes of gangs and criminal behavior. Throughout the book, recurring motifs of violence, rebellion, and religion undergird the author's ultimate theme of transformation. He anchors the reader within his story by focusing attention on how he transforms first from the child Kody Scott to the brutal gang member Monster and then transforms a second time from Monster to the devout revolutionary Sanyika Shakur.

While *Monster: The Autobiography of an L.A. Gang Member* has both positives and negatives, the weaknesses outweigh the strengths. The most notable strength is the author's skill in conveying the palpable anguish and hopelessness he experienced. Another strength is its immediacy, providing a compelling and unique first-hand account of someone who lived through the cruelty of gang life. It could have been a powerful book if written well. Instead, the poor structure and writing of this book make it a painful read. The content of the book has the potential to be interesting and inspiring, but the structure is subpar. The lack of writing skill makes it difficult to digest the book's content and pick

out its purpose. The biggest flaw in execution is the lack of organization. Where the raw material can inspire or motivate, the way it is written makes it difficult for those things to clearly materialize. The pacing causes confusion because of jumps in the timeline that offer no explanation. The swift speed at which events happened ironically causes the story to feel slow because of the uncertainty it leaves. A plodding pace and unclear timeline combine into a very unenjoyable combination.

While the author targets a general audience in his approach, the result, whether unintentionally or not, narrows his readership to those who have a preexisting and keen interest in gangs or criminology. For readers who are required to read this book or who are just generally interested in the inner workings of gang life, this book may be an excellent choice. However, for general readers seeking enjoyment or inspiration, this book is not a desirable choice. Too many books better depict the inspiration of overcoming life's obstacles to make this one a standout choice.

This autobiographical book offers a detailed, raw perspective of gang life. While gangs have adapted in the years since this book was written, the intense, vivid portrayal of the emotions that drive a person into the folds of a gang and to commit violent and criminal acts in its name is timeless. The same human emotions drive gang activity and crime today and will continue to do so tomorrow. As a work that connects something of which little is known to shared human experience, this book has made its place in literature. It calls attention to the brutality and dangers of gang-life while also showing how to overcome any obstacles life may bring. *Monster: An Autobiography of an L.A. Gang Member* gives a glimpse into the terrifying yet moving life of Sanyika Shakur. Despite the frustration reading this book may cause, one cannot help but respect the emotional journey that he took.

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