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Understanding How Two Major Events and the 1840 Election Impacted the Presidential Legacy of Martin Van Buren

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Abstract

The purpose of this paper is to increase the understanding of how the Panic of 1837, the Aroostook War of 1839, and the Presidential Election of 1840 impacted the presidential legacy of Martin Van Buren. The Panic of 1837 was characterized by an economic depression, devaluing of paper money, loan defaults, bank runs, and bank failures. The Aroostook War of 1839 was between the United States and the United Kingdom over the international boundary between the British colony of New Brunswick and the state of Maine of the United States. The major issue of the 1840 Presidential Election was the Panic of 1837 and the winner of the 1840 Presidential Election was Whig William Henry Harrison.

Key Words: Martin Van Buren

Introduction

Martin Van Buren took office as the 8ᵗʰ United States President on March 4, 1837, after winning the 1836 Presidential Election. The purpose of this paper is to increase the understanding of how the Panic of 1837, the Aroostook War of 1839, and the Presidential Election of 1840 impacted the presidential legacy of Martin Van Buren. Firstly, this paper examines the Panic of 1837 by focusing on its causes, its major consequences, and its impact on the legacy of President Martin Van Buren. Secondly, this paper examines the Aroostook War of 1839 by focusing on its causes, its major consequences, and its impact on the legacy of President Martin Van Buren. Thirdly, this paper examines the Presidential Election of 1840 by focusing on its candidates, its features, and its impact on the legacy of President Martin Van Buren. Lastly, this paper concludes with an analysis of how the Panic of 1837, the Aroostook War of 1839, and the Presidential Election of 1840 impacted the presidential legacy of Martin Van Buren.

Panic of 1837

The Panic of 1837 started 5 weeks into the presidency of Martin Van Buren. According to the article, *The Panic of 1837* (2023), the Panic of 1837 started May 10, 1837, because that is when banks in New York that were running out of hard currency reserves refused to convert paper money into gold or silver. Essentially, banks were not able to redeem currency notes in gold and silver. The Panic of 1837 was characterized by an economic depression, devaluing of paper money, loan defaults, bank runs, and bank failures. President Martin Van Buren thought the easy availability of credit led to the Panic of 1837 and tried to help the Panic of 1837 by moving federal funds from state banks to an independent treasury.

Major Causes of the Panic of 1837

The major causes of the Panic of 1837 were (1) the closure of the 2nd National Bank in 1836, (2) wildcat pet banks, and (3) the Specie Circular Executive Order of 1836. According to the article, *Nineteenth-Century Banking and the Financial Panic of 1837* (2023), the charter of the 2nd National Bank was signed into law by President James Madison on April 10, 1816. It began operations at its main branch in Philadelphia on January 7, 1817, and by 1832 it had 25 branches. The United States government owned 20% of its capital and the private investors owned 80%. It received all of the government's deposits including foreign customs duties and used the money to pay the government's expenses and to provide loans to farmers and industrialists.

The charter of the 2nd National Bank expired in January of 1836 and all of the federal government's deposits from tariff proceeds and public land sales were sent to state banks based on each state's representation in Congress. According to the article, *Nineteenth-Century Banking and the Financial Panic of 1837* (2023), state banks were allowed to issue their paper currency and provide easy loans and credit to businesses, state governments, and land speculators. The closure of the 2nd National Bank was one of the key causes of the Panic of 1937 because it led to a free state banking system without federal government regulation. State governments were free to grant bank charters and some banks issued loans and banknotes (paper currency) not backed by deposits of gold or silver.

According to the article, *Nineteenth-Century Banking and the Financial Panic of 1837* (2023), in 1837 ninety-nine state pet banks were receiving federal revenues, and some of them engaged in speculative lending practices without enough money in reserve. Unregulated wildcat state pet banks were established in western states due to the demands of land speculation. The wildcat state pet banks were banks that were not backed by species (meaning gold and silver. The wildcat state pet banks also distributed practically worthless paper currency (banknotes) backed by questionable securities. The wildcat state pet banks were one of the key causes of the Panic of 1937 because their lending practices led to many bank runs, bank failures, and defaults on bank loans.

The Specie Circular Executive Order was issued by President Andrew Jackson on July 11, 1836, and it required gold or silver as payment for the purchase of public lands. According to the article, *The Panic of 1837* (2023), the United States Treasury Department and the state pet banks that received public money could only accept species as payment for government-owned land purchased by speculators after August 15, 1836, and by settlers after December 31, 1336. The Specie Circular Executive Order of 1836 was one of the key causes of the Panic of 1837 because its restrictions on banks resulted in bankruptcies, loan defaults, and bank failures. Congress repealed the Specie Circular Executive Order on May 21, 1838.

Major Consequences of the Panic of 1837

The major consequences of the Panic of 1837 are (1) bank runs and bank failures, (2) loan defaults, and (3) the Independent Treasury Act of 1840. According to the article, *The Panic of 1837* (2023), after the Specie Circular Executive Order was issued in 1836 many people who held banknotes (paper money) immediately went to the banks to get gold and silver in exchange for their banknotes. These bank runs or the sudden withdrawal of a significant amount of money led to the depletion of the cash reserves of many banks. Essentially, there were many bank failures because many banks did not have enough deposits on hand when many depositors

withdrew funds at the same time and many banks were not able to give everyone back all their money.

According to the article, *The Panic of 1837* (2023), there were 850 state banks at the start of the Panic of 1837, 343 state banks closed in 1837, and the other 507 state banks experienced defaults on loans between 1837 and 1843. Essentially, some businesses and farmers defaulted on their loans and lost their property because they were unable to pay their bank loans. Many businesses and farmers ended up selling their property to the highest bidder. Some people lost their homes because they were unable to pay the mortgages on their homes. Some cities had homeless people living on the streets and some cities had soup kitchens to feed the poor and homeless.

President Van Buren proposed an independent treasury in September of 1837. According to the article, *19ᵗʰ Century Banking and the 1837 Financial Panic* (2023), the proposed independent treasury would require the custom tax collectors to deposit the taxes that they collected into the sub-treasuries. Congress passed the Independent Treasury Act on June 30, 1840, and it was signed into law by President Martin Van Buren on July 4, 1840. The independent treasury allowed the federal government to (1) hold its money balances in the form of gold or silver, (2) not print paper money without the backing of gold or silver, and (3) be independent of all business affairs of the nation.

Impact on the Presidential Legacy of Martin Van Buren

It is an important fact that the Panic of 1837 impacted the presidential legacy of Martin Van Buren. Essentially, the presidential legacy of Martin Van Buren was impacted in the following major ways because of how he handled the Panic of 1837.

- He gets credit for helping Congress repeal the Specie Circular Executive Order on May 21, 1838.
- He gets credit for starting a system for retaining government funds in the United States Treasury and its sub-treasuries.
- He gets credit for not doing enough to help the nation overcome the economic downturns created by the Panic of 1837.

Aroostook War of 1839

The Aroostook War of 1839 was between the United States and the United Kingdom over the international boundary between the British colony of New Brunswick and the state of Maine of the United States. According to the article, *The Aroostook War of 1839* (2023), the Aroostook War of 1839 was a bloodless war because the governments involved in the conflict did not engage in armed combat or just war.

Major Causes of the Aroostook War of 1839

One major cause of the Aroostook War of 1839 was that the eastern international border between New Brunswick of the United Kingdom and Maine of the United States was not clearly defined by the 1783 Treaty of Paris. A second major cause of the Aroostook War of 1839 was the actions of the lumbermen and governors of New Brunswick and Maine. A third major cause of the

Aroostook War of 1839 was the troops that were sent to the disputed area by Maine, New Brunswick, the United Kingdom, and the United States.

The governments of the United Kingdom and the United States claimed their own borders because the highlands producing the eastern United States–Canada border was not clearly defined by the 1783 Treaty of Paris. According to the article, *1783 Treaty of Paris*, the eastern United States–Canada border was as follows.

- Starts at the angle which is formed by a line drawn north from the source of the Saint Croix River to the highlands which divide the rivers that empty into the Saint Lawrence River from the rivers that fall into the Atlantic Ocean.
- Continues west along the highlands to the northwestern head of the Connecticut River, then along the Connecticut River to the 45th degree north latitude, and then west on the 45th degree north latitude to the Cataraquy River and Lake Ontario.

The unclear eastern United States–Canada border outlined in the 1783 Treaty of Paris was a major cause of the Aroostook War of 1839. According to the article, *The Aroostook War of 1839* (2023), about 12,000 square miles were in dispute because both the United Kingdom and the United States claimed that the highlands that formed the eastern United–Canada border along the northern edge of Maine were as follows.

- The United Kingdom claimed that this border was at the Mars Hill Mountains located at the 46th degree north latitude.
- The United States claimed that this border was at the Sugarloaf Mountains located at the 48th degree north latitude.

According to the article, *The Aroostook War of 1839* (2023), the actions of the lumbermen and governors of New Brunswick and Maine were one of the major causes of the Aroostook War of 1839. By the winter of 1838, both New Brunswick and Maine were cutting timber in the disputed areas. In January 1839, Maine Governor John Fairfield in January 1839 sent a civil posse to the upper Aroostook River Valley where the Saint John River meets the Aroostook River. The civil posse was ordered to arrest the New Brunswick lumbermen and send them to Bangor, Maine for trial. In January 1839, New Brunswick Governor John Harvey proclaimed military action if the civil posse from Maine continued to exercise jurisdiction in the upper Aroostook River Valley where the Saint John River meets the Aroostook River. He also sent a civil posse to arrest the civil posse from Maine and send them to Woodstock, New Brunswick for trial.

The troops that were sent to the disputed area by Maine, New Brunswick, the United Kingdom, and the United States were one of the major causes of the Aroostook War of 1839. According to the article, *The Aroostook War of 1839* (2023), the Aroostook War started on February 1839 due to the following military actions by Maine, New Brunswick, the United Kingdom, and the United States.

- February 1839 = Maine sent 10,000 militia men to Aroostook to join the civil posse.
- March 1839 = New Brunswick sent 1,000 soldiers to every tributary of the Saint John River in the Aroostook Territory.
- March 1839 = United Kingdom sent 15,000 troops to the Saint John River area near Fort Kent, Maine.

- March 1839 = United States sent 50,000 troops to Augusta, Maine so that General Winfield Scott could be the peacemaker between New Brunswick Governor John Harvey and Maine Governor John Fairfield.

Major Consequences of the Aroostook War of 1839

The major consequences of the Aroostook War of 1839 were (1) the agreement between President Martin Van Buren and the British Minister, (2) the truce made by General Winfield Scott and Sir John Harvey, and (3) the Webster-Ashburton Treaty of 1842. According to the article, *The Bloodless Aroostook War* (2023), in March of 1839, President Martin Van Buren and the British Minister in Washington agreed that New Brunswick would not attack Maine, that Maine would withdraw from the Aroostook, and that both sides would agree to a joint solution to deal with incidents of trespass.

On March 21, 1839, General Winfield Scott and Sir John Harvey arranged a truce and a joint occupancy of the territory in dispute until a final settlement could be reached. According to the article, *The Bloodless Aroostook War* (2023), Maine was given control of the lower Aroostook River Valley, and New Brunswick was given control of the upper Aroostook River Valley. Essentially, the Aroostook War of 1839 was a bloodless war and the soldiers departed the area in April and May of 1839.

British Diplomat Lord Baron Ashburton and United States Secretary of State Daniel Webster started negotiations on April 4, 1842. A final settlement of the disputed border was reached by the United States and Great Britain in the Webster–Ashburton Treaty on August 9, 1842. It outlined the Maine-Canada border and the border between Canada and New Hampshire, Michigan, and Minnesota. It divided the disputed 12,027 square miles by giving 7,015 to the United States and 5,012 to the United Kingdom.

Impact on the Presidential Legacy of Martin Van Buren

It is an important fact that the Aroostook War of 1839 impacted the presidential legacy of Martin Van Buren. The presidential legacy of Martin Van Buren was impacted in the following two ways because of how he handled the Aroostook War of 1839.
- He gets credit for getting the British to agree that New Brunswick would not attack Maine, that Maine would withdraw from the Aroostook, and that both sides would agree to a joint solution to deal with incidents of trespass.
- He gets credit for keeping the war bloodless by arranging a truce to keep the peace and provide for joint occupancy of the territory in dispute until a satisfactory settlement could be reached.

Presidential Election of 1840

According to the article, *The Presidential Election of 1840* (2023), the main purpose of the election was to elect the President and Vice-President of the United States of America. The popular vote was held from Friday, October 30, 1840 to Wednesday, December 2, 1840. The Electoral College vote was held on Wednesday, December 2, 1840. There were 26 states and a total of 294 electoral votes in the 1840 Presidential Election. A candidate needed to win at least 148 electoral votes to win the presidential election.

Major Candidates of the 1840 Presidential Election

According to the article, *The Presidential Election of 1840* (2024), the Democrat Party nominated President Martin Van Buren (New York) to be the party's candidate for president and did not nominate someone to be the party's candidate for vice president. The Whig Party nominated Former United States Senator William Henry Harrison (Ohio) to be the party's candidate for president and Former United States Senator John Tyler (Virginia) to be the party's candidate for vice president.

Major Features of the 1840 Presidential Election

According to the article, *The Presidential Election of 1840* (2024), the major issue of the 1840 Presidential Election was the Panic of 1837. Whig William Henry Harrison won the 1840 Presidential Election and became the 9th United States President because he won 234 electoral votes and 19 states. Democrat Martin Van Buren lost the 1840 Presidential Election because he won 60 electoral votes and 7 states.

According to the article, *The United States Presidential Election of 1840* (2024), there were 13 flipped states because a different political party won the state in the 1836 and 1840 Presidential Elections. The 13 flipped states accounted for 171 of the 294 electoral votes as follows.
- Martin Van Buren won 1 Flipped State = South Carolina (11 electoral votes).
- William Henry Harrison won 12 Flipped States (160 electoral votes).
  - Massachusetts (14), Georgia (11), Tennessee (15), New York (42), Pennsylvania (30), North Carolina (15), Maine (10), Connecticut (8), Louisiana (5), Mississippi (4), Rhode Island (4), and Michigan (3).
- Martin Van Buren lost 9 states (121 electoral votes) he won in 1836.
  - New York (42), Pennsylvania (30), North Carolina (15), Maine (10), Connecticut (8), Louisiana (5), Mississippi (4), Rhode Island (4), and Michigan (3).

Impact of the Presidential Legacy of Martin Van Buren

It is an important fact that the results of the 1840 Presidential Election impacted the presidential legacy of Martin Van Buren. Moreover, the presidential legacy of Martin Van Buren was impacted in the following three major ways due to the results of the 1840 Presidential Election.
- He gets credit for being the third of eleven incumbent presidents to try and fail to win re-election.
- He gets credit for losing the 9 flipped states of New York (42), Pennsylvania (30), North Carolina (15), Maine (10), Connecticut (8), Louisiana (5), Mississippi (4), Rhode Island (4), and Michigan (3) due the way that he handled the Panic of 1837.

Conclusion

Firstly, I rank Martin Van Buren in the bottom 23 of the 46 presidents for his presidential leadership when it comes to the impact of the Panic of 1837 on his presidential legacy. Secondly, I rank Martin Van Buren in the bottom 23 of the 46 presidents for his presidential leadership when it comes to the impact of the Aroostook War of 1839 on his presidential legacy. Thirdly, I rank Martin Van Buren in the bottom 23 of the 46 presidents for his presidential leadership when it comes to the impact of the 1840 Presidential Election on his presidential legacy. Essentially, the

presidential legacy of Martin Van Buren was greatly impacted by the Panic of 1837, the 1839 Aroostook War, and the 1840 Presidential Election.

- Panic of 1837
  - He gets credit for helping Congress repeal the Specie Circular Executive Order on May 21, 1838.
  - He gets credit for starting a system for retaining government funds in the United States Treasury and its sub-treasuries.
  - He gets credit for not doing enough to help the nation overcome the economic downturns created by the Panic of 1837.
- Aroostook War of 1839
  - He gets credit for getting the British to agree that New Brunswick would not attack Maine, that Maine would withdraw from the Aroostook, and that both sides would agree to a joint solution to deal with incidents of trespass.
  - He gets credit for keeping the Aroostook War of 1839 bloodless by arranging a truce and a joint occupancy of the territory in dispute until a satisfactory settlement could be reached.
- 1840 Presidential Election
  - He gets credit for being the third of eleven incumbent presidents to try and fail to win re-election.
  - He gets credit for losing the 9 flipped states of New York (42), Pennsylvania (30), North Carolina (15), Maine (10), Connecticut (8), Louisiana (5), Mississippi (4), Rhode Island (4), and Michigan (3) due the way that he handled the economic downturns created by the Panic of 1837.

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Student Preferences for Online vs In-Person Learning

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Abstract

The research report examines the experiences and perceptions of students regarding online and in-person semesters, particularly in light of the COVID-19 pandemic's impact on educational formats. Surveys were conducted among students who experienced both modes of instruction to understand their preferences, challenges, and satisfaction levels. To ensure a diverse respondent pool, an anonymous survey link was disseminated via email, text messages, and various social media platforms to individuals within the researcher's network, including friends, family, school staff, and peers associated with IIT-Bombay.

A total of 158 usable responses were collected via Google Forms, providing a robust dataset for comprehensive analysis, and were analyzed using Stata. Findings indicate that approximately 75% of respondents favored in-person learning over online formats. T-tests revealed that both male and female respondents exhibited significantly higher preferences for in-person learning. This underscores the importance of the mode of teaching environment. Regression analysis further elucidated that the learning environment was influenced by factors including discipline, extracurricular involvement, and face-to-face interaction.

Additionally, variables such as extra time and pronunciation issues positively impacted preferences for online education, while engagement and discipline hurt the preference for in-person learning. These findings offer valuable insights into the dynamics of student preferences and the implications for educational delivery methods, particularly in the context of the pandemic-induced shift to online learning. Throughout the research endeavor, utmost care was taken to adhere to contemporary standards, ensuring the utilization of recent and credible sources.

Keywords: Online learning, In-person learning, Student preferences

Preface

In embarking on this research project exploring preferences between online and in-person modes of education, the authors were driven by their personal experiences with both modalities of teaching and learning. Having navigated both online and in-person learning environments, students may find themselves drawn to one mode over the other. Recognizing the inherent value in each experience, this research aims to ascertain whether these sentiments were shared by others or if

they diverged. Thus, the genesis of this research project lay in the desire to gauge the collective opinion of students regarding modes of education. A comprehensive questionnaire was created to capture the varied perspectives and preferences that shape the educational journeys of students.

Moreover, as active members of different institute bodies, the authors envisioned utilizing the outcomes of this research to contribute to the student community's overall development and welfare. Leveraging roles within the Alumni Association and the institute senate committee, the authors aimed to translate these findings into tangible initiatives aimed at enhancing the students' experiences. Through targeted efforts such as promoting donations and funding for technological advancements and infrastructure improvements, as well as advocating for curriculum changes and fostering in-person extracurricular activities, it was sought to create meaningful and impactful changes based on the insights derived from this research.

With a commitment to utilizing proven data to drive positive change, the authors embarked on this research journey to contribute to the holistic growth and development of the student community.

Objectives

The objectives of this research endeavor are multifaceted and aim to shed light on the comparative dynamics of in-person and online learning methods within the realm of data analysis education. Firstly, the study seeks to meticulously evaluate the efficacy of in-person and online learning approaches, discerning their strengths and weaknesses. A comprehensive assessment endeavors to uncover the advantages and limitations inherent in each mode of instruction, providing valuable insights for educators, students, and policymakers.

The research endeavor is to delve into the experiences and preferences of students regarding in-person and online learning environments, aiming to discern the factors influencing students' satisfaction and engagement across both modalities. By examining the impact of in-person and online learning methods on students' comprehension and application of data analysis concepts, the study endeavors to illuminate the pedagogical implications and inform future course designs and teaching methodologies. Ultimately, the research aspires to contribute to the ongoing discourse surrounding the evolution of modern education, offering empirical evidence and recommendations to enhance the learning experience and optimize student outcomes in the field of data analysis education.

Methodology

Surveys were conducted among students who experienced both modes of instruction to understand their preferences, challenges, and satisfaction levels. Likert questions were utilized to gauge preferences based on extracurricular activities, discipline, and interaction with peers and professors. The research initiative commenced in August 2023 and concluded in September 2023, encompassing the data collection period. The research process initiated the formulation of a comprehensive questionnaire using online forms, comprising 25 diverse inquiries ranging from demographic details to preferences regarding learning environments. Following questionnaire development, the data were meticulously coded into Stata for systematic analysis. To ensure a

diverse respondent pool, an anonymous survey link was disseminated via email, text messages, and various social media platforms to individuals within the researcher's network, including friends, family, school staff, and peers associated with IIT Bombay.

A total of 158 usable responses were collected via Google Forms, providing a robust dataset for comprehensive analysis, and were analyzed using Stata.

Analysis

The Analysis section consists of a data summary – an analysis of each variable separately, followed by one-sample t-tests, independent sample t-tests, and regression analyses.

Data Summary

- **Gender**

What is your gender?			
	Frequency	Percentage	Cumulative Percent
Prefer not to say	3	1.90	1.90
Non-binary	3	1.90	3.80
Female	55	34.81	38.61
Male	97	61.39	100.00

What is your gender
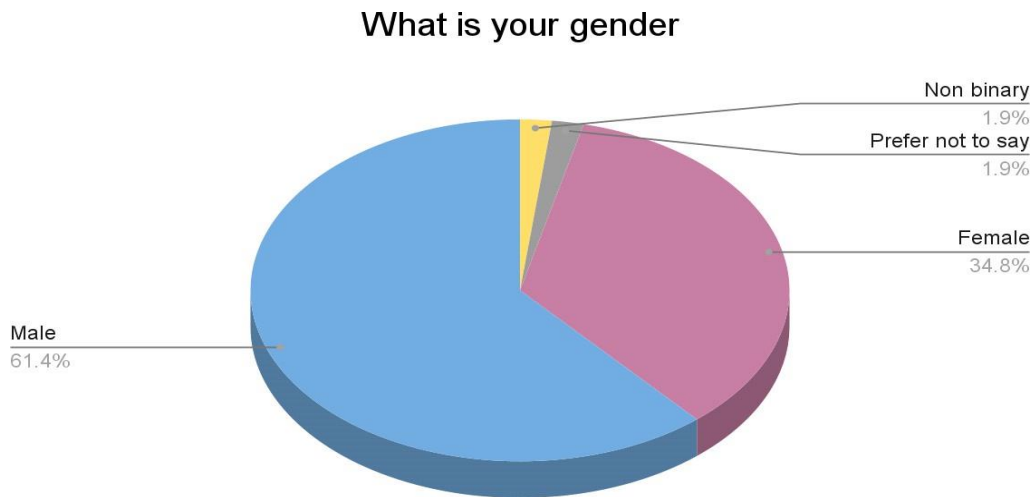
It is noted that 61.39% of the sample was male, and 34.81% was female. This distribution is inconsistent with the population at IIT Bombay, where the gender ratio for the undergraduate program typically ranges from 11-14% for females and 86% for males. The observed deviation in gender distribution within the sample compared to the established gender ratio at IIT Bombay's undergraduate program is significant. Although official data on gender ratios at the institution may

vary annually, the sample showed a higher proportion of female respondents than what is typically observed. This incongruity could be attributed to various factors, including the survey's circulation within female friend groups and family networks, potentially leading to the overrepresentation of female respondents in the sample. It is important to recognize these potential biases in sample recruitment and consider their implications for the generalizability of the findings.

Reference: [IIT Bombay Gender Ratio](#)

- **Age**

The age range of the respondents varies from 12 to 72 years, with 4 observations missing in the sample. The average age was 27.01 years, and the median age was 21 years. Notably, the majority of respondents fall within the typical age range of the student population at IIT Bombay, which generally spans individuals between 18 and 22 years of age. This alignment indicates that the sample effectively reflects the demographic profile of the student body at IIT Bombay, thereby bolstering the relevance and applicability of the research findings to this specific population.

Age Frequency

- **Are you a student?**

Missing
1.9%

No
24.7%

Yes
73.4%
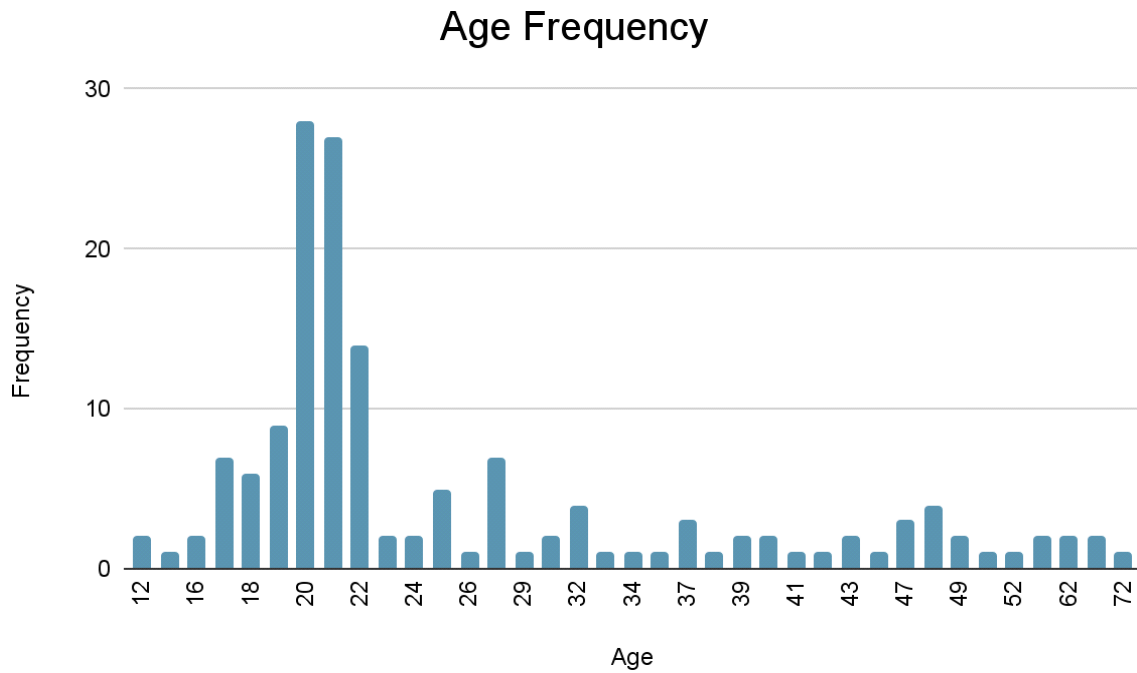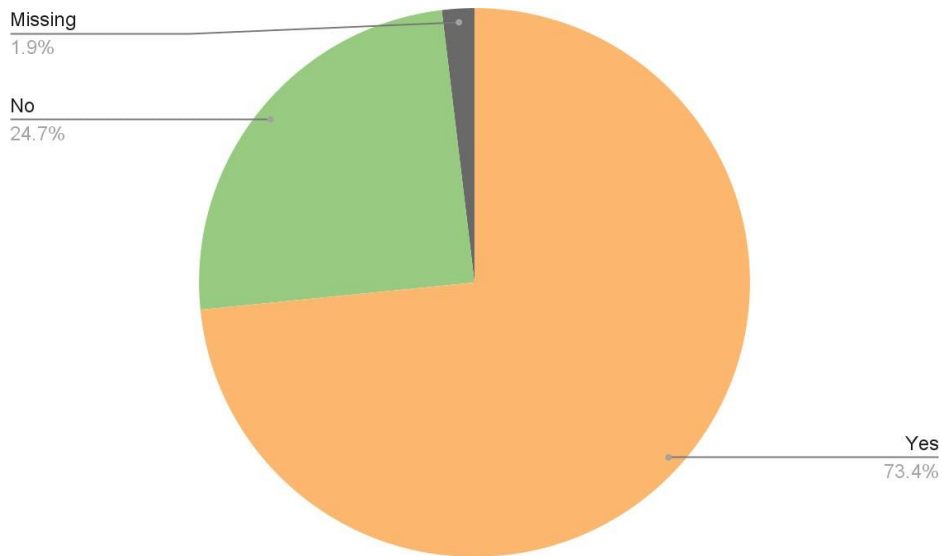
The dataset comprises 116 responses from students and 39 from non-students, encompassing recent graduates, parents, guardians, and staff members. This diversity affords a rich dataset for comprehensive analysis. While non-student respondents may not have directly experienced both modes of academic instruction, their insights into their children's or family members' educational experiences offer valuable perspectives.

Parents and guardians, in particular, may harbor preferences or biases shaped by their observations of academic life and interactions with educational institutions. These perspectives could be influenced by factors such as the perceived effectiveness of teaching methodologies, the impact of technology on learning outcomes, and considerations regarding extracurricular activities and social interactions. Exploring these perspectives can yield valuable insights into the broader implications of in-person and online learning modes on various stakeholders within the educational ecosystem. Therefore, incorporating the perspectives of non-student respondents, especially parents and guardians, adds depth and richness to the analysis, facilitating a more holistic understanding of the dynamics surrounding educational preferences and experiences.

• __I believe technology helps in better understanding__

It is observed that 88.46% of respondents Agreed or Strongly Agreed that they believe technology helps in better understanding. This is consistent with the high mean for this variable, which is 4.08 on a 5-point Likert scale. No missing data were found for this question.

Technology helps in better understanding	Frequency	Percentage	Cumulative Percentage
Strongly Disagree	8	5.06	5.06
Disagree	3	1.90	6.96
Neither Agree nor Disagree	8	5.06	12.03

Agree	89	56.33	68.35
Strongly Agree	50	31.65	100.00
Total	158	100	100

The overwhelming agreement among respondents, with 88.46% indicating that they believe technology aids in better understanding, underscores the perceived value of technological integration in educational settings. This sentiment is further corroborated by the high mean score of 4.08 on a 5-point Likert scale for this variable, indicating strong consensus among participants. Importantly, no missing data were identified for this question, highlighting the robustness of the findings.
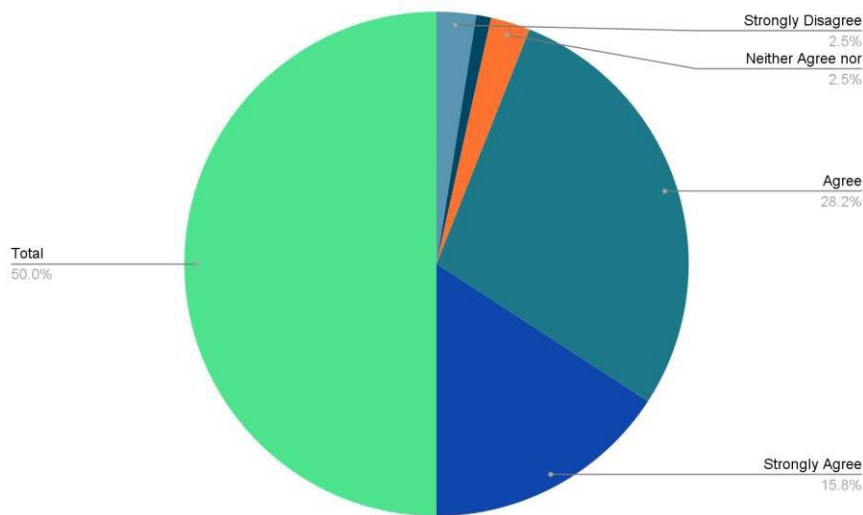
From a managerial perspective, institutions such as IIT Bombay must heed this resounding sentiment when strategizing class offerings and educational initiatives. The institution's efforts to equip students with fundamental skill sets through the introduction of courses like Data Science and AI, basics of computer programming, and utilization of technology-enhanced tools such as slides and online assignments align with the prevailing belief in the efficacy of technology for enhancing learning outcomes. By providing accessible and technologically integrated resources, IIT Bombay is proactively addressing the evolving educational needs of its student body and fostering an environment conducive to comprehensive skill development.

Therefore, leveraging technology to augment educational experiences aligns with students' preferences and expectations and underscores IIT Bombay's commitment to fostering innovative and adaptive learning environments that empower students to thrive in an increasingly digital world.

• **In-person learning teaches a lot more discipline**

In-person learning teaches a lot more discipline	Frequency	Percentage	Cumulative Percentage
Strongly Disagree	6	3.80	3.80
Disagree	4	2.53	6.33
Neither Agree nor Disagree	11	6.96	13.29

Agree	65	41.14	54.43
Strongly Agree	72	45.57	100.00
Total	158	100	100

In-person learning teaches a lot more discipline
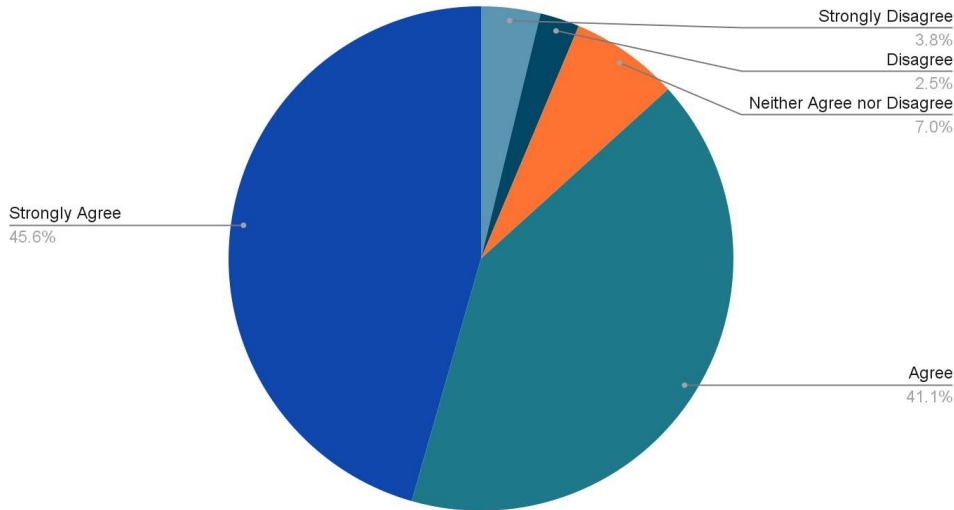
The overwhelming agreement among respondents, with 86.71% expressing the belief that in-person learning instills greater discipline, is indeed noteworthy, particularly in light of the high mean score of 4.22 on a 5-point Likert scale for the valid variables. This collective sentiment underscores the perceived efficacy of in-person instruction in cultivating discipline among students.

One potential explanation for this finding is the myriad of extracurricular activities typically available to students on campus. These activities contribute to a vibrant campus life and play a pivotal role in establishing and reinforcing daily routines and structured schedules. The communal aspect of participating in extracurriculars fosters accountability, time management skills, and a sense of belonging among students, factors that are integral to the development of the discipline.

In contrast, replicating such a comprehensive and immersive experience in an online setting poses challenges. While virtual platforms offer opportunities for engagement and interaction, they may not fully capture the rich tapestry of experiences and interactions available in a physical campus environment. As a result, students may find it more challenging to establish and adhere to consistent routines and disciplinary practices in an online space.

Recognizing the value of extracurricular activities in promoting discipline, educational institutions, and online learning platforms can explore innovative approaches to integrate similar opportunities for engagement and community-building in virtual environments. By fostering a sense of belonging and providing avenues for structured activities and interactions, online education can better support students in developing the discipline necessary for academic success and personal growth.

- **I think in-person learning is better than online education**

The finding that 74.77% of respondents agreed or strongly agreed that they believe in-person learning is better than online education is noteworthy, particularly considering the high mean score of 4.02 on a 5-point Likert scale for this variable. This substantial consensus among participants underscores a prevailing preference for in-person instruction over online education.

I think in-person learning is better than online education		Frequency	Per cent	Valid Percent	Cumulative Percentage
	Strongly Disagree	5	3.16	3.24	3.24
	Disagree	9	5.80	5.84	9.08
	Neither Agree nor Disagree	23	14.56	14.93	24.01
	Agree	57	36.07	37.01	61.02
Valid	Strongly Agree	60	38.70	38.96	100.00
	Total	154	97.46	100	
Missing	System	4	2.53		
Total		158	100		

I think in-person learning is better than online education
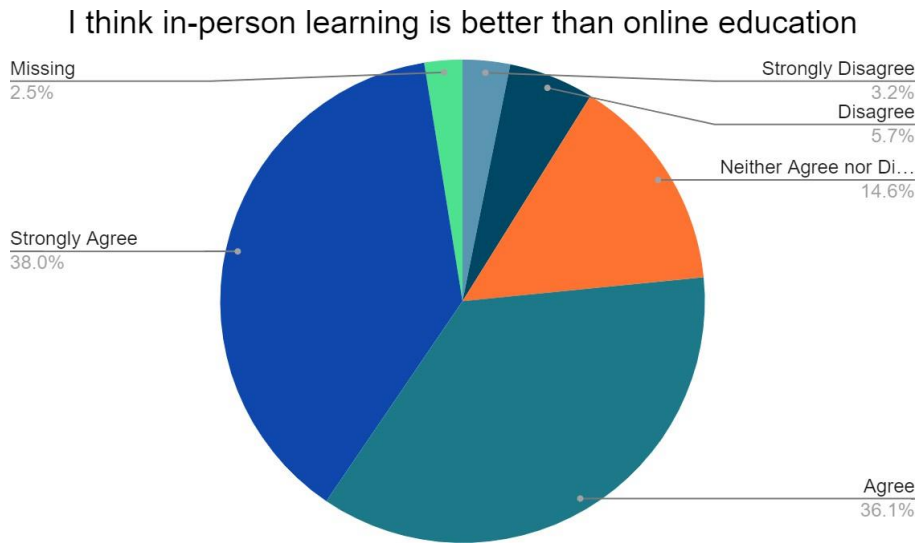
- <u>**Learning is the same in class and at home on the Internet**</u>

It is observed that 77.93% of respondents Disagree or Strongly Disagree that learning is the same in class and at home. This aligns with the low mean for this variable, which is 2.03 on a 5-point Likert scale.

Learning is the same in class and at home, on the Internet		Frequency	Percentage	Valid Percent	Cumulative Percentage
	Strongly Disagree	53	33.54	34.42	34.42
	Disagree	67	42.40	43.51	77.92

	Neither Agree nor Disagree	15	9.49	9.74	87.66
	Agree	13	8.22	8.44	96.10
Valid	**Strongly Agree**	6	3.79	3.90	100.00
	Total	154	97.46	100	
Missing	**System**	4	2.53		
Total		158	100		

Learning is the same in class and at home, on the Internet
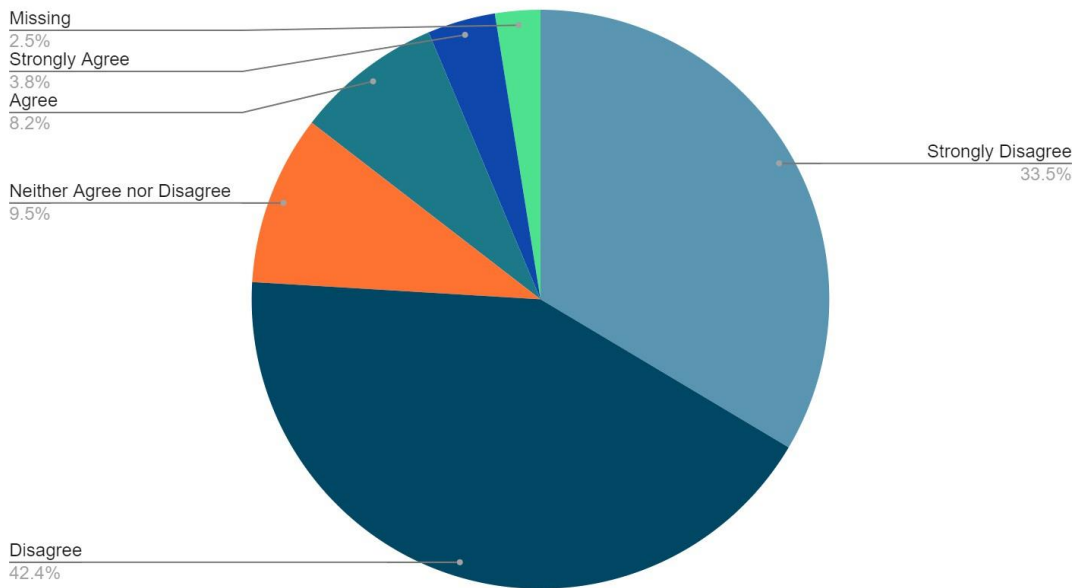
It was found that 75.9% of the responses showed that learning is not the same in the class as at home using the internet. It can be further supported by obtaining a low score of 2.03 on a 5-point Likert scale for this variable considering only the valid responses. While the specific reasons for this discrepancy remain unclear, exploring other questionnaire data offers an opportunity to pinpoint factors influencing this perception and guide optimization efforts for both classroom and online learning environments.

One Sample T-Test (Test of one mean)

The managerial implication drawn from the strong preference for in-person learning is crucial for IIT Bombay's planning of class offerings. The majority of variables with high scores, either insignificantly different from 4 on a 5-point Likert scale or significantly greater than 4, favor in-person learning. Conversely, most low scores, significantly less than the mid-point, are associated with online learning. This suggests a precise alignment of participant preferences toward the benefits and effectiveness of in-person instruction. In response to these findings, IIT Bombay may consider prioritizing and enhancing in-person educational experiences to address the specific factors contributing to traditional classroom settings' perceived superiority. Recognizing and

incorporating these preferences into planning can optimize students' satisfaction, engagement, and overall success.

One-Sample T-Tests

		N	Mean	t	df	One sided p	Two sided p
				Test Value=4			
Learning is the same in class and at home on the Internet.	Significantly < 3.0	154	2.03	-22.83	153	0	0
I am better able to connect with batchmates and professors in an online learning environment.		156	2.04	-23.69	155	0	0
I think online education is better than in-person learning.		157	2.21	-18.45	156	0	0
I believe that learning on the Internet outside of class is more motivating than a regular course.		154	2.69	-13.36	153	0	0
I feel relaxed while responding to questions in my chat as I don't have to pay attention to pronunciation.	Insignificantly different from 3.0	153	2.98	-11.56	152	0	0
With online courses, I can manage my study time effectively and easily complete assignments on time.		158	3.13	-9.37	157	0	0
Online teaching provides me with extra time to take on more courses and projects.	Significantly < 4.0 & Significantly >3.0 (Lies bet. 3 and 4)	153	3.45	-6.215	152	0	0
I feel that face-to-face contact with my instructor is necessary to learn.		155	3.77	-2.66	154	0.0042	0.008
I interact a lot more in person than online over chats and meets.	Insignificantly different from 4.0	152	3.84	-1.78	151	0.0384	0.0768
Online Learning ensures effectiveness in terms of coping with missed lectures.		154	3.88	-1.52	153	0.0643	0.13
Everyone is not economically able to invest in laptops, tablets, etc required for online learning.		153	3.89	-1.48	152	0.0705	0.14
I believe looking back on what I have learned in a course will help me to remember it better.		154	3.94	-0.81	153	0.2094	0.42
In my studies, I get distracted easily online with other activities.		158	3.97	-0.41	157	0.3386	0.68
I think in-person learning is better than online education.		154	4.02	0.31	153	0.37	0.76

I can easily access the Internet as needed for my studies.		158	4.04	0.63	157	0.2631	0.53
In-person learning is more interesting than online learning.		152	4.06	0.79	151	0.214	0.428
I believe technology helps in better understanding.		158	4.08	1.007	157	0.157	0.312
As a student, I enjoy working with other students in groups.		154	4.13	2.01	153	0.02	0.04
I possess sufficient computer keyboarding skills for doing online work.		154	4.14	2.08	153	0.01	0.04
As a student, I like taking part in in-person interactions, sports, debates, and extracurricular activities.	Significantly > 4.0	155	4.16	2.09	154	0.01	0.04
In-person learning teaches a lot more discipline.		158	4.22	2.89	157	0	0.0043
In-person learning offers maximum engagement between students and teachers.		153	4.23	3.25	152	0	0.0014

Independent Sample T-Tests (Test of Differences Between Means)

The analysis of gender differences in the variables revealed notable distinctions in perceptions among male and female respondents:

Females rated the following variables significantly higher compared to males (at the 0.05 level of significance):
- In-person learning teaches a lot more discipline
- I feel that face-to-face contact with my instructor is necessary to learn

On the other hand, males rated the following variables significantly higher compared to females (at the 0.1 level of significance):
- I can easily access the Internet as needed for my studies
- As a student, I enjoy working with other students in groups.

Implications:
The study reveals a consistent preference among both female and male respondents for in-person learning over online teaching. However, it is crucial to acknowledge the study's limitation due to the smaller sample size, which may compromise the generalizability and robustness of the findings. Therefore, interpreting the results requires caution and understanding that conclusions are based on a limited representation of the population under investigation. Despite this limitation, the study provides valuable insights by elucidating observed patterns, trends, and relationships within the available data.

Note: The following two statements, "As a student, I enjoy working with other students in groups" and "I can easily access the Internet as needed for my studies," yielded p-values exceeding the 0.05 threshold but remained below 0.10. While the smaller sample size may have influenced these results, they are reported to highlight potential trends despite not meeting the conventional threshold of significance. This nuanced reporting approach ensures transparency and encourages further exploration into the intricacies of the data.

Independent Samples										
		t-tests for Equality of Means								
				Significance						
		t	df	One-sided p	Two-sided p	Gender	N	Mean	Std. Deviation	Std. Error Mean
I believe technology helps in better understanding.	Equal variance assumed	1.110	150.000	0.134	0.267	Female	55	4.230	0.637	0.086
	Equal variance not assumed	1.240	147.186	0.107	0.214	Male	97	4.070	0.981	0.099
In-person learning teaches a lot more discipline.	Equal variance assumed	1.900	150.000	0.059	0.030	Female	55	4.450	0.571	0.077
	Equal variance not assumed	2.190	149.980	0.015	0.030	Male	97	4.170	1.000	0.101
I am better able to connect with batchmates and professors in an online learning environment.	Equal variance assumed	0.412	148.000	0.340	0.680	Female	53	2.030	0.940	0.130
	Equal variance not assumed	0.420	112.306	0.338	0.670	Male	97	1.960	0.994	0.100
With online courses, I can manage my study time effectively and easily complete assignments on time.	Equal variance assumed	-0.040	150.000	0.520	0.960	Female	55	3.140	1.060	0.140
	Equal variance not assumed	-0.048	124.151	0.520	0.960	Male	97	3.150	1.200	0.122

		t	df	Sig.	Mean Diff.	Gender	N	Mean	Std. Dev.	Std. Error Mean
I can easily access the Internet as needed for my studies.	Equal variance assumed	-1.630	150.000	0.053	0.105	Female	55	3.920	0.790	0.106
	Equal variance not assumed	-1.660	118.772	0.050	0.099	Male	97	4.150	0.845	0.085
In my studies, I get distracted easily online with other activities.	Equal variance assumed	0.066	150.000	0.470	0.940	Female	55	4.000	0.960	0.130
	Equal variance not assumed	0.060	105.721	0.470	0.950	Male	97	3.980	0.890	0.090
I believe looking back on what I have learned in a course will help me to remember it better.	Equal variance assumed	0.640	146.000	0.260	0.520	Female	54	4.020	0.857	0.117
	Equal variance not assumed	0.630	109.290	0.262	0.525	Male	94	3.920	0.845	0.087
As a student, I like taking part in in-person interactions, sports, debates, and extracurricular activities.	Equal variance assumed	0.988	147.000	0.160	0.320	Female	55	4.273	0.732	0.099
	Equal variance not assumed	1.077	141.151	0.142	0.280	Male	94	4.117	1.025	0.106
As a student, I enjoy working with other students in groups.	Equal variance assumed	-1.500	146.000	0.068	0.136	Female	54	4.056	0.787	0.107
	Equal variance not assumed	-1.490	109.190	0.069	0.138	Male	94	4.255	0.775	0.080
I possess sufficient computer keyboarding skills for doing online work.	Equal variance assumed	-0.581	146.000	0.720	0.560	Female	54	4.110	0.769	0.105
	Equal variance not assumed	-0.590	118.010	0.720	0.550	Male	94	4.200	0.833	0.086
I feel that face-to-face contact with my	Equal variance assumed	1.860	147.000	0.030	0.060	Female	55	4.018	0.913	0.123

instructor is necessary to learn.	Equal variance not assumed	1.930	125.720	0.027	0.055	Male	94	3.702	1.046	0.108
	Equal variance assumed	0.270	146.000	0.390	0.780	Female	54	2.037	1.045	0.142
Learning is the same in class and at home on the Internet.	Equal variance not assumed	0.270	107.520	0.390	0.790	Male	94	1.989	1.011	0.104
I believe that learning on the Internet outside of class is more motivating than a regular course.	Equal variance assumed	0.124	146.000	0.450	0.900	Female	54	2.685	1.179	0.160
	Equal variance not assumed	0.125	113.980	0.450	0.900	Male	94	2.660	1.223	0.126
	Equal variance assumed	-0.306	146.000	0.620	0.760	Female	54	4.056	1.140	0.155
I think in-person learning is better than online education.	Equal variance not assumed	-0.284	88.060	0.610	0.780	Male	94	4.106	0.861	0.089
Online Learning ensures effectiveness in terms of coping with missed lectures.	Equal variance assumed	-0.213	146.000	0.580	0.830	Female	54	3.870	0.891	0.121
	Equal variance not assumed	-0.220	116.606	0.590	0.830	Male	94	3.904	0.951	0.098
Everyone is not economically able to invest in laptops, tablets, etc required for online learning.	Equal variance assumed	0.900	145.000	0.182	0.366	Female	54	4.019	0.714	0.097
	Equal variance not assumed	0.980	146.610	0.164	0.328	Male	93	3.882	0.965	0.100
In-person learning offers maximum engagement between students and teachers.	Equal variance assumed	0.903	145.000	0.184	0.370	Female	54	4.352	0.677	0.092
	Equal variance not assumed	0.970	134.290	0.167	0.335	Male	93	4.226	0.886	0.092

Statement							Group	N	Mean		
I feel relaxed while responding to questions in my chat as I don't have to pay attention to pronunciation.	Equal variance assumed	0.840	145.000	0.201	0.403	Female	54	3.111	1.022	0.139
	Equal variance not assumed	0.956	117.850	0.196	0.393	Male	93	2.957	1.103	0.114
In-person learning is more interesting than online learning.	Equal variance assumed	0.740	144.000	0.229	0.459	Female	53	4.189	0.900	0.124
	Equal variance not assumed	0.767	118.723	0.222	0.445	Male	93	4.065	1.009	0.105
I interact a lot more in person than online over chats and meets.	Equal variance assumed	-0.498	144.000	0.691	0.619	Female	54	3.833	0.966	0.132
	Equal variance not assumed	-0.517	123.805	0.697	0.606	Male	92	3.924	1.112	0.116
Online teaching provides me with extra time to take on more courses and projects.	Equal variance assumed	-0.695	145.000	0.756	0.488	Female	54	3.389	1.036	0.141
	Equal variance not assumed	-0.705	115.540	0.759	0.483	Male	93	3.516	1.090	0.113
I think online education is better than in-person learning.	Equal variance assumed	1.209	149.000	0.114	0.228	Female	55	2.345	1.265	0.171
	Equal variance not assumed	1.172	102.350	0.122	0.244	Male	96	2.104	1.128	0.115

Regression   **Analysis**

Regression Analysis 1: Dependent variable: I think in-person learning is better than online education

Dependent variable regress upon In-person learning is more interesting than online learning, I feel that face-to-face contact with my instructor is necessary to learn; In my studies, I get distracted easily online with other activities, I am better able to connect with batchmates and professors in an online learning environment and constant.

The analysis indicates that these independent variables collectively explain 53.71% of the variance in the dependent variable "I think in-person learning is better than online education." This suggests that the included independent variables contribute significantly to explaining variation in the

perception   of   in-person   learning   versus   online   education.

```
      Source |       SS          df       MS            Number of obs   =        150
-------------+----------------------------------        F(4, 145)       =      44.22
       Model | 89.010948          4   22.252737         Prob > F        =     0.0000
    Residual | 72.9623853       145   .503188864        R-squared       =     0.5495
-------------+----------------------------------        Adj R-squared   =     0.5371
       Total | 161.973333       149   1.08706935        Root MSE        =     .70936
```

```
  off_online |  Coefficient  Std. err.      t     P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
 interesting |   .4636264    .0684407     6.77    0.000     .3283561    .5988966
         f2f |   .3864029    .0624198     6.19    0.000     .2630327    .5097732
     distract |  -.1526628    .0696936    -2.19    0.030    -.2904094   -.0149162
     connect |  -.1955232    .0583993    -3.35    0.001    -.3109471   -.0800994
       _cons |   1.685904    .367516      4.59    0.000     .9595238    2.412285
```

ANOVA

Dependent variable: I think in-person learning is better than online education.
Independent variable: In-person learning is more interesting than online learning, I feel that face-to-face contact with my instructor is necessary to learn, In my studies, I get distracted easily online with other activities, I am better able to connect with batchmates and professors in an online learning environment and constant.

Based on the ANOVA, the regression as a whole demonstrates a linear relationship between the variables, significant at the 0.000 level.

```
             Number of obs =        150    R-squared      =  0.5911
             Root MSE      =   .705716    Adj R-squared =  0.5419
```

Source	Partial SS	df	MS	F	Prob>F
Model	95.734753	16	5.983422	12.01	0.0000
interesting	22.676961	4	5.6692401	11.38	0.0000
f2f	19.849457	4	4.9623643	9.96	0.0000
distract	3.3381563	4	.83453908	1.68	0.1593
connect	8.9476001	4	2.2369	4.49	0.0020
Residual	66.238581	133	.49803444		
Total	161.97333	149	1.0870694		

Coefficient

Final Regression Equation:

I think in-person learning is better than online education =
0.455 * In-person learning is more interesting than online learning
+ **0.392** * I feel that face-to-face contact with my instructor is necessary to learn
- **0.139** * In my studies, I get distracted easily online with other activities
- **0.195** * I am better able to connect with batchmates and professors in an online learning environment

It makes sense that the first two variables positively affect preference for in-person learning, and the other two have a negative effect.

Implications: IIT Bombay should focus on increasing the interaction in online learning as well so that students feel connected with the professors as well as their fellow batchmates. Also, some workshops or programs will help students achieve mental peace and increase attention, as it will help them improve their overall personality.

Source	SS	df	MS			
				Number of obs	=	150
				F(4, 145)	=	44.22
Model	89.010948	4	22.252737	Prob > F	=	0.0000
Residual	72.9623853	145	.503188864	R-squared	=	0.5495
				Adj R-squared	=	0.5371
Total	161.973333	149	1.08706935	Root MSE	=	.70936

off_online	Coefficient	Std. err.	t	P>|t|	Beta
interesting	.4636264	.0684407	6.77	0.000	.4556675
f2f	.3864029	.0624198	6.19	0.000	.3927756
distract	-.1526628	.0696936	-2.19	0.030	-.139342
connect	-.1955232	.0583993	-3.35	0.001	-.1959452
_cons	1.685904	.367516	4.59	0.000	.

Regression Analysis 2: Dependent variable: I think online education is better than in-person learning.
Independent variable: Online teaching provides me extra time to take upon more courses and projects;
Online Learning ensures effectiveness in terms of coping with missed lectures;
Everyone is not economically able to invest in laptops, tablets, etc, required for online learning;
As a student, I like taking part in in-person interactions, sports, debates, and extracurricular activities.

Model Summary:

Dependent variable: I think online education is better than in-person learning. Independent variable:
1. Online teaching provides me extra time to take on more courses and projects.
2. I feel relaxed while responding to questions in my chat as I don't have to pay attention to pronunciation.
3. As a student, I like taking part in in-person interactions, sports, debates, and extracurricular activities.
4. In-person learning offers maximum engagement between students and teachers.
5. In-person learning teaches a lot more discipline.

In this regression analysis, the model has successfully explained **39.60%** of the variance in the dependent variable "I think in-person learning is better than online education" through the included independent variables.

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Source	SS	df	MS			
				Number of obs	=	152
				F(5, 146)	=	20.80
Model	93.7956187	5	18.7591237	Prob > F	=	0.0000
Residual	131.678065	146	.901904558	R-squared	=	0.4160
				Adj R-squared	=	0.3960
Total	225.473684	151	1.49320321	Root MSE	=	.94969

online_offline	Coefficient	Std. err.	t	P>|t|	[95% conf. interval]	
extratime	.4189992	.0741135	5.65	0.000	.2725253	.5654731
relaxed	.3034602	.0754261	4.02	0.000	.1543921	.4525283
offinteraction	-.0928795	.0844193	-1.10	0.273	-.2597211	.0739621
engagement	-.1869325	.0996511	-1.88	0.063	-.3838775	.0100125
discipline	-.2511364	.0920121	-2.73	0.007	-.432984	-.0692887
_cons	2.134603	.6366624	3.35	0.001	.8763383	3.392868

ANOVA

Dependent variable: I think online education is better than in-person learning. **Independent variable:**
1. Online teaching provides me extra time to take on more courses and projects.
2. I feel relaxed while responding to questions in my chat as I don't have to pay attention to pronunciation.
3. As a student, I like taking part in in-person interactions, sports, debates, and extracurricular activities.
4. In-person learning offers maximum engagement between students and teachers.
5. In-person learning teaches a lot more discipline.

```
                 Number of obs =        152    R-squared      =  0.5165
                 Root MSE       =  .912249    Adj R-squared =  0.4427

       Source │ Partial SS        df         MS           F      Prob>F
   ────────────┼──────────────────────────────────────────────────────
        Model │  116.45578        20   5.8227892        7.00   0.0000

     extratime │  27.491775         4   6.8729437        8.26   0.0000
       relaxed │  7.8745078         4    1.968627        2.37   0.0562
   offintera~n │  2.6746226         4   .66865565        0.80   0.5251
    engagement │  7.0538003         4   1.7634501        2.12   0.0820
    discipline │  10.998558         4   2.7496394        3.30   0.0129

      Residual │   109.0179       131   .83219771

   ────────────┼──────────────────────────────────────────────────────
         Total │  225.47368       151   1.4932032
```

Based on the ANOVA, the regression as a whole demonstrates a linear relationship between the variables, significant at the 0.000 level.

Coefficients

```
       Source │      SS         df         MS        Number of obs   =       152
   ────────────┼──────────────────────────────────      F(5, 146)      =     20.80
        Model │  93.7956187        5  18.7591237        Prob > F       =    0.0000
     Residual │  131.678065       146  .901904558       R-squared      =    0.4160
   ────────────┼──────────────────────────────────      Adj R-squared =    0.3960
        Total │  225.473684       151  1.49320321       Root MSE       =    .94969


  online_offline │  Coefficient  Std. err.     t     P>|t|                     Beta
  ───────────────┼──────────────────────────────────────────────────────────────────
       extratime │   .4189992    .0741135     5.65   0.000                  .3781755
         relaxed │   .3034602    .0754261     4.02   0.000                  .2710585
   offinteraction │  -.0928795    .0844193    -1.10   0.273                 -.0734191
      engagement │  -.1869325    .0996511    -1.88   0.063                  -.130563
      discipline │  -.2511364    .0920121    -2.73   0.007                 -.1881079
           _cons │   2.134603    .6366624     3.35   0.001                         .
```

Final regression equation:

I think online education is better than in-person learning = **0.378** * Online teaching provides me extra time to take more courses and projects
+ **0.271** * feel relaxed while responding to questions in my chat, as I don't have to pay attention to pronunciation
- **0.073** * As a student, I like taking part in in-person interactions, sports, debates, and extracurricular activities
-0.130 * In-person learning offers maximum engagement between students and teachers
-0.188 * In-person learning teaches a lot more discipline

It makes sense that the first two variables have a positive effect on preference for in-person learning, and the other three variables have a negative effect.

Implications: IIT Bombay should focus on decreasing workload in the in-person semester so that students have ample amount of time to take on projects after participating in in-person extracurricular activities.

Conclusions

Based on the survey findings, several significant trends and insights emerge regarding respondents' attitudes and experiences with different modes of learning:

1. Technology and Learning: The majority of respondents acknowledge the role of technology in facilitating a better understanding of course materials.

2. Preference for In-Person Learning: In-person learning is strongly favored by most respondents, primarily due to its perceived ability to foster discipline and enable engaging interactions, sports, and extracurricular activities.

3. Gender Dynamics: Females tend to prioritize the disciplinary aspects and face-to-face interactions inherent in in-person learning. At the same time, males emphasize the importance of easy Internet access for their studies.

4. Perceptions of In-Person vs. Online Learning: A significant majority of respondents express skepticism about the equivalence of learning experiences between in-person and online settings, indicating a clear preference for traditional classroom instruction.

5. Attitudes Towards Online Teaching: Online teaching is met with resistance or ambivalence among respondents, with few expressing a strong preference.

6. Digital Skills and Access: While many respondents possess adequate computer skills for online work, disparities in access to necessary technology, such as laptops and tablets, underscore potential barriers to online learning for some individuals.

These findings highlight the diverse perspectives and challenges associated with different learning modes. Addressing these insights can inform educational policies and practices aimed at creating inclusive and effective learning environments for all students.

Recommendations

1. Implement Collaborative Tools: Educational institutions should integrate collaborative tools such as discussion forums, online group projects, and instant messaging platforms into their online learning environments. These tools facilitate peer-to-peer interaction, teamwork, and knowledge sharing, enriching the online learning experience.

2. Leverage Personalized Learning Technology: Utilize adaptive learning platforms that analyze students' performance data to offer personalized recommendations and resources. This approach ensures students receive tailored support aligned with their individual learning needs, enhancing overall engagement and academic success.

3. Develop Multimedia-Rich Learning Materials: Create multimedia-rich and interactive learning materials that cater to diverse learning styles. Incorporating videos, simulations, quizzes, and gamified elements into course content promotes students' engagement and deepens understanding of complex concepts.

4. Enhance Keyboarding Skills: Implement courses or programs aimed at enhancing students' keyboarding skills for online work. Proficiency in keyboarding improves productivity, efficiency, and overall performance in the digital work environment, preparing students for success in online learning and beyond.

5. Provide Financial Assistance for Technology Access: Governments and educational institutions should allocate funds to provide subsidies or financial assistance programs targeting economically disadvantaged individuals or families. This support enables them to acquire the necessary devices for online learning, fostering equitable access to education and narrowing the digital divide.

By implementing these recommendations, educational institutions can enhance the quality and accessibility of online learning experiences, empowering students to succeed in an increasingly digital world.

Limitations

The research project is indeed subject to several limitations that warrant acknowledgment and consideration:

1. Lack of Comprehensive Literature Review: The absence of a thorough literature review may result in overlooking pertinent prior studies and theoretical frameworks. This limitation could compromise the validity and contextual relevance of the research findings.

2. Use of Random Sampling: Employing random sampling techniques may introduce sample bias and limit the generalizability of the findings to the broader population. Furthermore, random sampling may overlook specific characteristics of interest, thus missing important nuances within the data.

3. Smaller Sample Size: The research project may not comprehensively capture diverse perspectives and viewpoints with a smaller sample size. This limitation restricts the depth and richness of the findings, preventing conclusive statements regarding relationships between variables, such as gender differences.

4. Low Response Rate: A low response rate can undermine the reliability and precision of the results. A higher margin of error or confidence interval associated with a low response rate reduces the accuracy and confidence in the findings, potentially impacting the study's credibility.

5. Discrepancy in Male-Female Ratio: The discrepancy in the male-female ratio compared to the demographic composition of IIT Bombay limits the direct applicability of the findings to summarize college structures and policies. This disparity underscores the importance of ensuring sample representation reflective of the target population.

Addressing these limitations requires careful consideration and potential adjustments in research methodology, sample recruitment strategies, and data analysis techniques. By acknowledging these constraints, researchers can enhance the rigor and validity of their study and provide more robust insights into the research topic.

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Leveraging AI to Integrate Practical Life Skills into Social Studies Education: Enhancing Student Engagement and Future Readiness

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Abstract

This paper explores the potential of artificial intelligence (AI) in assisting educators to incorporate practical life skills into social studies lessons. By integrating AI technologies, teachers can bridge the gap between theoretical knowledge and real-world applications, making learning more engaging and relevant for students. The article discusses the challenges and considerations associated with implementing AI in the classroom and highlights the importance of developing future-ready skills through social studies education. The paper also addresses the role of AI in fostering civic engagement, personalization, and inclusivity while considering the digital divide. The conclusion emphasizes the need for further research and collaboration between educators and AI experts to harness the full potential of AI in social studies education.

Introduction

In an increasingly complex and rapidly evolving world, students often question the relevance of the subjects they learn in school. The common refrain, "Why do I have to learn this stuff?" underscores the need for educators to bridge the gap between theoretical knowledge and practical life skills. Social studies, a subject that encompasses a wide range of disciplines, including history, geography, economics, and civics, offers a unique opportunity to integrate practical life skills into the curriculum. However, many educators struggle to make these connections in a meaningful and engaging way. Artificial intelligence (AI) presents a powerful tool for addressing this challenge and transforming social studies education.

AI in Education: Bridging the Gap: AI has the potential to revolutionize education by providing personalized learning experiences, automating administrative tasks, and offering insights into student performance (Zawacki-Richter et al., 2019). In the context of social studies, AI can assist teachers in developing lesson plans that incorporate practical life skills, such as critical thinking, problem-solving, and decision-making. For example, AI-powered simulations and virtual reality experiences can immerse students in historical events or contemporary social issues, allowing them to explore multiple perspectives and develop empathy (Radianti et al., 2020). By leveraging AI, educators can create learning experiences that are more engaging, interactive, and relevant to students' lives.

Practical Life Skills through Social Studies: Social studies education provides a rich canvas for teaching practical life skills. For instance, studying economics can help students understand personal finance, budgeting, and investment strategies. Learning about government and civic engagement can foster skills in leadership, advocacy, and community organizing. Exploring global issues can develop skills in cross-cultural communication, collaboration, and conflict resolution. AI can assist teachers in identifying connections between social studies content and practical life skills, generating lesson plans and resources that explicitly highlight these links. By

making these connections explicit, educators can help students appreciate the value of social studies education and its relevance to their lives.

AI and Future-Ready Skills: As the world becomes increasingly digitized and automated, students need to develop future-ready skills to thrive in the workforce and society. The World Economic Forum (2020) identifies critical thinking, problem-solving, creativity, and digital literacy as essential skills for the future. Social studies education, enhanced by AI, can play a crucial role in cultivating these skills. For example, AI-powered tools can analyze historical data and generate predictions about future trends, encouraging students to think critically about the implications of social, economic, and political decisions (Gulson et al., 2022). AI can also facilitate collaborative problem-solving exercises, where students work together to address complex social issues using data-driven insights and creative thinking (Luckin et al., 2016).

Challenges and Considerations: Integrating AI into social studies education presents several challenges and considerations. One major concern is the digital divide, which refers to the unequal access to technology and digital resources among students (Van Dijk, 2020). Educators must ensure that all students have access to the necessary tools and support to benefit from AI-enhanced learning experiences. Additionally, there are ethical considerations around data privacy, algorithmic bias, and the potential for AI to perpetuate social inequalities (Agarwal, 2020). Educators must work closely with AI experts to address these concerns and develop responsible and equitable AI solutions for social studies education.

Expanding the Role of AI in Developing Civic Engagement: AI can play a significant role in fostering civic engagement among students. By analyzing social media data and online discussions, AI can help educators identify issues that are important to students and their communities (Hossain & Nadeem, 2019). AI-powered tools can also facilitate online discussions and debates, encouraging students to engage in constructive dialogue and develop skills in argumentation and persuasion. Moreover, AI can assist in matching students with local organizations and volunteer opportunities based on their interests and skills, promoting community involvement and civic responsibility.

AI-Enhanced Personalization and Inclusivity in Social Studies: One of the most promising applications of AI in social studies education is personalization. AI algorithms can analyze student data, such as learning preferences, strengths, and weaknesses, to generate customized learning experiences (Kucirkova & Littleton, 2020). This personalization can help educators address the diverse needs of learners, including those with learning disabilities or language barriers. AI-powered translation tools can make social studies content more accessible to English language learners, while adaptive learning systems can provide additional support and resources for students who struggle with certain concepts (Qutieshat et al., 2021). By promoting inclusivity and equity, AI can help create a more engaging and effective social studies education for all students.

Addressing the Digital Divide: To fully realize the potential of AI in social studies education, it is crucial to address the digital divide. Policymakers and school administrators must invest in the necessary infrastructure and resources to ensure that all students have access to reliable internet, devices, and software. Additionally, educators must receive adequate training and support to effectively integrate AI into their teaching practices (Januszewski et al., 2021). Collaborative

efforts between schools, technology companies, and community organizations can help bridge the digital divide and promote digital equity in education.

Conclusion: AI offers a powerful tool for transforming social studies education and addressing the age-old question, "Why do I have to learn this stuff?" By integrating AI technologies, educators can bridge the gap between theoretical knowledge and practical life skills, making learning more engaging, relevant, and future-ready. However, the successful implementation of AI in social studies education requires careful consideration of ethical concerns, the digital divide, and the need for responsible and equitable AI solutions. As educators and AI experts continue to collaborate and innovate, the potential for AI to enhance social studies education and prepare students for the challenges of the 21st century is immense.

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Harnessing the Power of Artificial Intelligence for Dynamic Social Studies Learning in Secondary Classrooms

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Abstract

Artificial Intelligence (AI) has emerged as a transformative force in education, offering unprecedented opportunities to enhance social studies instruction in secondary classrooms. This paper explores ten innovative AI applications designed to personalize learning, simulate historical events through immersive technologies, and enhance critical thinking and source analysis skills. Drawing upon a comprehensive literature review, we highlight AI's capacity to make social studies more engaging, relevant, and accessible to diverse student populations. We also address ethical considerations and the need for critical engagement with technology to avoid perpetuating biases and inequities. We argue that when implemented thoughtfully, AI tools can significantly deepen students' historical understanding, promote active engagement, and prepare them for the complexities of the digital age. However, successful integration of AI in education requires careful planning, continuous educator learning, and ethical considerations to truly benefit secondary social studies instruction and foster informed, critically thinking citizens.

Introduction

The use of AI technologies in educational settings has grown exponentially in recent years, sparking extensive research to understand their impact and best practices for implementation (Roll & Wylie, 2016). Specific attention has been dedicated to understanding AI's implications within social studies education, with the core goal of improving both teaching practices and student outcomes.

AI-powered personalized learning systems tailor content, pacing, and instructional strategies to individual student needs (Vandewaetere et al., 2011). By analyzing data on student performance, engagement, and learning preferences, these systems can recommend targeted resources, adapt difficulty levels, and provide real-time feedback. In social studies classrooms, personalized learning can help students explore their specific interests, address knowledge gaps, and progress at their own pace.

AI facilitates virtual reality (VR) and augmented reality (AR) simulations that propel students into the heart of historical events (Fowler, 2015). Students might don VR headsets to witness the signing of the Declaration of Independence or virtually walk the streets of a rapidly industrializing Victorian city. AI-powered simulations help break down the flat textbook narrative by placing students directly in the shoes of historical actors, promoting empathy and a more vibrant understanding of the past (Walczak et al., 2020).

In an era of pervasive misinformation, AI can play a crucial role in developing students' critical thinking and source evaluation skills (Kahne & Bowyer, 2017). AI-powered tools can analyze the credibility, bias, and perspective of historical sources, guiding students in their investigations. By engaging with AI-facilitated primary source analysis and Socratic dialogue with virtual historical figures, students can hone their analytical skills and explore multiple viewpoints.

As AI becomes increasingly integrated into social studies education, it is crucial to address ethical considerations and potential risks (Dignum, 2018). Educators must be vigilant in identifying and mitigating biases that may be embedded in AI systems, ensuring that they do not perpetuate historical inequities or marginalize certain perspectives (Mittelstadt et al., 2016). Moreover, the use of student data in AI-powered learning systems raises privacy concerns that must be carefully navigated.

Top 10 AI Tools for High School Social Studies

- AI-Powered Personalized Learning: AI-powered personalized learning platforms, such as Knewton and Dreambox Learning, can adapt social studies content and assessments to individual student needs, ensuring that each learner receives targeted support and resources (Pane et al., 2014). These systems analyze student performance data, identify knowledge gaps, and recommend personalized learning paths, enabling students to progress at their own pace and explore topics of interest in greater depth.

- Immersive Historical Simulations: AI-driven VR and AR simulations, such as those developed by Immersive VR Education and Schell Games, transport students to pivotal moments in history, allowing them to experience events firsthand (Allison, 2008). For example, students might find themselves in the trenches of World War I, navigating the Underground Railroad, or participating in the Women's Suffrage Movement. These immersive experiences foster empathy, contextual understanding, and a deeper connection to the past.

- AI-Facilitated Primary Source Analysis: AI tools, such as Newsela and ListenWise, can help students analyze and interpret primary sources by providing leveled texts, audio resources, and guided questions (Merzyn, 2019). These tools can also identify patterns, themes, and connections across multiple sources, helping students develop critical thinking and historical analysis skills. By engaging with AI-facilitated primary source analysis, students learn to evaluate the credibility, perspective, and significance of historical documents.

- Embracing Socratic Dialogue with AI: AI chatbots and virtual agents, such as Jill Watson and Replika, can engage students in Socratic dialogue, posing thought-provoking questions and challenging them to consider multiple perspectives. For example, students might converse with a virtual Socrates about the nature of justice, debate the merits of different political systems with a virtual world leader, or discuss the ethical implications of historical events with a virtual philosopher. These AI-powered dialogues encourage critical thinking, argumentative reasoning, and reflective discourse.

- Interdisciplinary and Data-Driven Projects: AI tools, such as Tableau and Google Data Studio, enable students to analyze and visualize historical data, uncovering patterns and trends that might otherwise go unnoticed. By engaging in interdisciplinary, data-driven projects, students can explore the intersection of social studies with fields like economics, geography, and political science. For example, students might use AI to analyze voting patterns, map the spread of ideas and innovations, or predict the outcomes of historical events based on key variables.

- Formative Assessment and Instant Feedback: AI-powered assessment tools, such as Gradescope and Formative, can provide students with instant feedback on their work, identifying strengths, weaknesses, and areas for improvement (Lynch et al., 2017). These tools can also help teachers track student progress, adapt instruction, and provide targeted interventions. By receiving immediate, personalized feedback, students can reflect on their learning, revise their work, and develop a growth mindset.

- Global Digital Collaborations: AI-powered translation tools, such as Google Translate and Microsoft Translator, can facilitate global digital collaborations among students from different countries and cultures (Groves & Mundt, 2015). These tools break down language barriers, enabling students to communicate, collaborate, and learn from one another. For example, students might work together on a cross-cultural history project, comparing different perspectives on a shared event or exploring the impact of global phenomena on local communities.

- Gamifying Social Studies with AI: AI-powered educational games and simulations, such as Civilization and iCivics, can make social studies content more engaging and interactive (Squire, 2005). These tools incorporate game-based learning principles, such as goal-setting, feedback, and rewards, to motivate students and promote active learning. By gamifying social studies, educators can create immersive, experiential learning opportunities that foster problem-solving, decision-making, and strategic thinking skills.

- Combating Misinformation Through Source Evaluation & Expansion: AI tools, such as Factmata and NewsGuard, can help students evaluate the credibility and bias of online sources, combating the spread of misinformation and fake news (Wardle & Derakhshan, 2017). These tools analyze the content, source, and context of information, providing students with a framework for critical media literacy. By learning to identify and counter misinformation, students become more discerning consumers and producers of information in the digital age.

- Ethical Considerations: As educators integrate AI into social studies instruction, they must also engage students in discussions about the ethical implications of these technologies (Floridi & Cowls, 2019). AI ethics education, through tools like MIT's Moral Machine and Princeton's AI Ethics course, can help students understand the potential risks and benefits of AI, including issues of bias, privacy, transparency, and accountability. By grappling with these ethical considerations, students develop a critical and reflective approach to AI that will serve them well as future leaders and decision-makers.

Discussion

The integration of AI in secondary social studies classrooms holds immense potential for transforming teaching and learning. By personalizing instruction, immersing students in historical experiences, and promoting critical thinking, AI tools can make social studies more engaging, relevant, and impactful. However, realizing this potential requires careful planning, ongoing professional development for educators, and a commitment to ethical use (Luckin et al., 2016).

Conclusion

AI is poised to revolutionize social studies education, offering new ways to engage students, deepen historical understanding, and foster critical thinking skills. By harnessing the power of AI responsibly and thoughtfully, educators can create dynamic learning experiences that prepare students for the challenges and opportunities of the 21st century. As we navigate this exciting frontier, ongoing research, collaboration, and ethical considerations will be essential to ensuring that AI truly benefits all learners and strengthens the fabric of social studies education.

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Increasing Access to Anti-Inflammatory Management for Autoimmunity in People with Bipolar Disorder: A Systematic Review

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Abstract

This systematic review evaluated studies investigating inflammation in bipolar disorder (BD), aiming to identify non-pharmacological health practices for people with BD to mitigate their risk of developing autoimmune disorders. An elevated prevalence of immune dysfunction in psychiatric disorders, particularly BD, has been linked closely with inflammation and its interactions with the central nervous system and gut microbiome. While therapies integrating anti-inflammatory agents into pharmacological treatments for BD show promise, lifestyle modifications such as anti-inflammatory dietary habits could offer individuals better access to preventative practices while enhancing the efficacy of formal treatment plans. PubMed and ScienceDirect were searched for eligible studies from 2018 to 2023 to find articles exploring the relationship between inflammation, autoimmune disorders, and BD. Six articles were included in the final review. Few eligible studies explored therapies and health practices targeting inflammation in BD while addressing autoimmune conditions. However, effective medications targeting inflammatory markers were identified in reducing episode severity and autoimmune conditions. Research efforts should target at-home risk mitigation techniques to inform clinicians in developing targeted interventions and empowering people with BD to manage and prevent autoimmune conditions.

Keywords: Inflammation, autoimmune disorders, bipolar disorder (BD), systematic review

Background

Bipolar disorder (BD) is a multifaceted psychiatric condition with extensive clinical variability and pathophysiology. Individuals with BD have a significant prevalence of medical comorbidities (Andrejew et al., 2020; SayuriYamagata et al., 2017). People with BD have a higher prevalence of autoimmune disorders such as systemic lupus erythematosus (SLE), autoimmune thyroiditis, psoriasis, multiple sclerosis, and rheumatoid arthritis (Chen et al., 2021; Perugi et al., 2015; Hsu et al., 2014). Immunological changes have been identified as a key factor in the neurobiology of BD, as research demonstrates a strong association between BD and immune dysfunction, implying a bidirectional link between immune dysregulation and mood disorders (Goldsmith et al., 2016). Clinical deterioration is progressive in BD, defined by phenomenology alterations, cognitive impairment, and poor medication response (Berk et al., 2011). This neuroprogression appears to be involved with changes in neurobiological pathways, such as inflammatory or immunological dysfunction, increased oxidative stress, and neurotrophic support breakdown (Barichello et al., 2021).

Complications of this comorbid profile pose significant obstacles in treatment and management, leading to a poorer average life expectancy, a higher risk of self-injury, and a higher readmission rate for patients (Spoorthy et al., 2019). Current treatments for BD have poor long-term outcomes, with significant rates of drug resistance and relapse (Halaris et al., 2023). The impact of various medication treatments on the immune system remains unclear in the absence of meaningful anti-inflammatory effects and challenges in treating patients with comorbid conditions (Rosenblat & McIntyre, 2017). Furthermore, most evidence-based therapies have poor tolerability and substantial side effects, such as weight gain and insulin resistance (Bak et al., 2014). Given the strong link between immunological dysfunction and BD, anti-inflammatory therapies offer promising alterations in BD outcomes (Rosenblat et al., 2014). Anti-inflammatory drugs may have disease-modifying benefits by addressing the underlying etiological processes rather than treating symptoms alone (Muneer et al., 2016). While some clinical trials have demonstrated favorable results of anti-inflammatory bipolar medications, long-term efficacy and impact on distinct patient subgroups deserve more exploration (Rosenblat & McIntyre, 2017).

The high rate of comorbid autoimmune diseases necessitates a thorough examination of the prevalence and impact of immune dysfunction among those with BD. Understanding the complexities of autoimmune mechanisms in BD is critical to informing clinical practices and developing targeted therapies. Recognizing the need for anti-inflammatory management in BD is vital to enhancing treatment techniques and overall patient outcomes. The objective of this systematic review is to explore treatments for inflammation in bipolar disorder (BD) to identify potential non-pharmacological health practices that patients can implement to reduce their risk for autoimmune disorders. Furthermore, the review aims to examine additional factors in the relationship between BD and autoimmunity, such as mood-stabilizing medications and the Gut Microbiota Barrier (GMB), shedding light on the potential benefits of increasing access to anti-inflammatory treatments.

Methods

Search Strategy

A comprehensive electronic search of databases (PubMed and Science Direct) was conducted using the keywords (("immune disease" OR "immune disorder" OR "immune dysfunction" OR autoimmune OR "autoimmune disorder" OR autoimmunity) AND "bipolar disorder"). Studies were limited to those published between 2018 and 2023 and available in English. Studies without primary data were not eligible. Established inclusion and exclusion criteria as defined in the PICOS table (Table 1) were utilized to refine the search process. The electronic search was conducted between February 9th, 2024, and February 12th, 2024. Additional search parameters were included in the search of ScienceDirect, including only research articles, case reports, or data articles with open access/archives.

Study Selection and Data Extraction

Articles produced from search results were saved to a Zotero database. Studies were screened by title and abstract for relevance to bipolar disorder and immune dysfunction or autoimmune disorders. Articles that had not undergone peer review had "In erratum" corrections, or were not fully accessible through the Sam Houston State University library were also

excluded. After the initial screening, full-text articles were retrieved and carefully reviewed for the significance of findings and sample eligibility, particularly participant age. The remaining articles were combined into one Zotero database and independently examined by two researchers for findings significant to the current study. The process of study selection is illustrated in Figure 1.

Disagreements were settled through discussion of study relevance and finding significance. Family studies, samples that excluded participants with autoimmune disorders, and participants with infections (i.e., encephalitis) were not eligible. Studies focusing on improving diagnostic accuracy, determining causality, examining childhood adversity or maltreatment, or equally focused on BD and other psychiatric conditions (i.e., Tobacco Use Disorder (TUD), Major Depressive Disorder (MDD), and Schizophrenia) were also excluded. Interventions or assessments used in each study should have included an experimental aspect of medications to treat inflammation and immune dysfunction, but studies were not necessarily excluded on this basis. No restrictions were placed on sample size, human or animal subjects, data collection points, study duration, or treatment frequency, approach, and dosage, but these were considered in our interpretation and discussion of findings. For example, studies may examine immune functions, such as peripheral inflammatory profiles, mitochondrial dysfunction, or blood-based inflammatory status; immune marker levels, such as decreased immunoglobulin G and TFN-a; or various inflammatory cytokines, such as CRP, complement C3 and C4, IFN-y, IL-4, and IL6, or TLR3, TLR4, BDNF, and INF-y.

Study characteristics and desired outcomes were outlined for data extraction. Both researchers independently and manually revisited and extracted data from the final set of articles from each study into a shared Excel sheet. Data included details of the report (country, author, year, and source of publication); the study (design, sample size, sample characteristics, and population); the participants (age, race, sex, medical history, and diagnoses); and the intervention or treatment (approach, duration, medication, dosage, and diagnostic tools.) Extracted data were compared, with any discrepancies or repeated information being resolved through discussion. Anticipating that studies would report outcomes for various inflammatory markers, a summary of results was focused on gathering potential treatment approaches and options.

Results

Study Search and Selection

PubMed and ScienceDirect searches provided a total of 412 articles. After removing duplicates, 403 abstracts were screened for eligibility based on the outlined criteria in the PICOS table (Table 1). Full-text documents of 59 articles were retrieved and carefully reviewed by each researcher for inclusion and exclusion factors, leaving 32 studies for final determination. Six articles were deemed significant and included in the systematic review. Many studies were excluded because their primary focus was on other psychiatric disorders, such as MDD, comorbid Tobacco Use Disorder (TUD), or Schizophrenia, or infections, such as encephalitis. Several studies aimed to evaluate the impact of childhood maltreatment, trauma, or adversity on BD and inflammation, which were also excluded. Studies analyzing the underlying mechanics and mechanisms of BD were not eligible, including comparative analyses across BD, Schizophrenia, and MDD, as well as studies determining the prevalence of autoimmune

disorders in the BD population. Cases where participants were misdiagnosed with BD were excluded, including a study by Goodman et al. (2022) in which the participant was correctly diagnosed with Neuropsychiatric Systemic Lupus Erythematosus (NPSLE).

Study Characteristics

The six studies included two case reports, one case-control, one longitudinal, and two experimental study designs, totaling 498 human participants, 30 male Sprague-Dawley rats, and some unknown number of Swiss mice. Three studies were published in China, one in Brazil, one in France, and one in India. Two studies assessed autoimmune diagnoses from Psoriasis to Behcet's disease to Sjogren's syndrome, including one case report of an autoimmune disorder leading to a Bipolar and Related Due to Medical Condition diagnosis (Shen et al., 2023). Three studies in total examined the efficacy of medication in treating mood-related symptoms (N=6), such as in Qi et al., where participants (n=4) received quetiapine and valproate (2023). Two of these studies, both case reports, evaluated the efficacy of concurrent mood-related and autoimmune treatments. Shen et al. (2023) initially treated a patient with Bipolar and Related Due to Medical Conditions with a combination of alprazolam and quetiapine for mood-related symptoms, later adjusting this to lurasidone, quetiapine, and lithium carbonate for BD, and methylprednisolone and cyclosporin for Behcet's disease. Uvais et al. (2020) treated a patient with comorbid BD and Psoriasis with oral sodium valproate and oral olanzapine for BD and Apremilast (immunosuppressant agent) along with other topical medications for Psoriasis.

Three studies focused on bipolar episodes, two with participants experiencing depressive episodes (Qi et al., 2023; Shen et al., 2023) and one with participants in both acute episodes and euthymic states (Angrand et al., 2021). Angrand et al., was the only study that provided no intervention, simply evaluating participants with various psychiatric diagnostic tools and comparing inflammatory markers of patients with BD in episodic states, patients with BD in euthymic states, and healthy controls (2021). To measure inflammatory markers and levels, two studies induced mania-like states in small rodents, such as an intraperitoneal injection of GBR12909 in de Miranda et al. (2020) and an intra-cerebroventricular (ICV) injection of Ouabain in Zhang et al. (2019). A summary of study characteristics is presented in Table 2.

Study Outcomes

Qi et al. identified ten major cell groups, including myeloid cells, CD4 T cells, CD8 T cells, proliferation T cells, NK cells, gd T cell B cells, platelets, hematopoietic stem cells, and RBCs (2023). Their treatment, quetiapine and valproate, effectively alleviated inflammation by reducing myeloid-mediated immune signaling pathways (Qi et al., 2023). Similarly, in Angrand et al., low levels of mitochondria DNAcnv were observed in cases of acute mania and correlated with disease severity and inflammation (2021). Uvais et al. brought special attention to the efficacy of apremilast, an oral phosphodiesterase-4 inhibitor used to treat psoriasis, and its safety for use among the BD population (2020). The only at-home management investigated was in Zhang et al., reporting the anti-inflammatory effects of Aspirin, which partially reversed manic-like symptoms by reversing the reduction of INF-y, as well as significantly increasing the reduced levels of TLR3 proteins and BDNF in the group receiving the treatment (2019). Nevertheless, all six studies identified inflammatory markers significantly associated with

bipolar episodes, and five of the studies reported treatments that effectively reduced inflammation, improved episode severity, and reduced immune dysfunction.

Discussion

This systematic review explored potential treatments for inflammation among adults with Bipolar Disorder (BD) experiencing immune dysfunction or autoimmune disorders. Many studies that were screened, but not included in the final analysis, investigated the underlying mechanics and associations of immune dysfunction in BD. Fewer studies tested anti-inflammatory treatments targeting autoimmune disorders in our population; none of the eligible studies explored non-pharmacological treatments. Only Zhang et al. examined the anti-inflammatory uses of a medication easily accessible to patients, reporting on the efficacy of Aspirin (2019). Thus, the original objective of the study was not satisfied. However, many medications commonly used to treat BD were reported to have anti-inflammatory properties and effectively reduce clinical manifestations of both BD and autoimmune conditions.

Shen et al. demonstrated the efficacy of quetiapine and lurasidone in suppressing central and peripheral inflammatory processes in Behcet's disease, specifically in a patient with Bipolar and Related Due to Medical Conditions (2023). Lithium and valproate were also examined by their ability to restore levels of brain-derived neurotrophic factor (BDNF) and nerve growth factor (NGF), conferring neuroprotective roles in both acute and chronic treatment scenarios (de Miranda et al., 2020; Zhang et al., 2019). Qi et al. highlighted the synergistic effects of quetiapine and valproate combination therapy in reducing myeloid-mediated immune signaling pathways, suggesting that concurrent quetiapine and valproate use may alleviate inflammation-related emotional disorders (2023). Qi et al. also linked the clinical deterioration of BD to alterations in immunology, such as phase-dependent inflammatory responses, reduced pro-inflammatory factor production, and inhibited B cell mitochondrial functioning (2023).

It should be acknowledged that certain medications commonly used in BD treatment, such as lithium, olanzapine, quetiapine, and aripiprazole, have potential adverse effects and may exacerbate or induce skin conditions like psoriasis (Uvais et al., 2020). Uvais et al. reported Apremilast as a potentially safe, effective treatment for psoriasis in BD, which can be used adjunctively with anticonvulsants and antipsychotics, such as valproate and olanzapine (2020). Aspirin is a nonsteroidal anti-inflammatory drug and has been shown to suppress inflammatory biomarkers, even exhibiting potential as a moderate antidepressant (Zhang et al., 2019). However, the limited evaluation of Aspirin's potential benefits and long-term uses in the BD population leaves unanswered questions as to its sustainability. Clinicians should consider both immunomodulatory benefits and potential side effects of medications when treating individuals with BD and autoimmune disorders.

Many studies have explored additional factors strongly correlated with inflammation and autoimmunity within the context of BD, including Adverse Childhood Experiences (ACEs), BD-related psychological stressors, the Gut Microbiota Biome (GMB), and the impact of psychiatric medications on inflammatory cytokines. Several articles evaluated the impact of childhood trauma, maltreatment, and ACEs on the development of BD and increased inflammatory responses (Porcu et al., 2022; Oliveira et al., 2021; Poletti et al., 2022). Porcu et al. (2022) suggested that understanding and addressing the impact of early life experiences could lead to

the development of targeted interventions to reduce inflammation and mitigate the severity of BD. Werner et al. (2022) further accentuated the role of stress and trauma in inflammation, emphasizing its significance in the context of BD and neuropsychiatric disorders. Indeed, stress remains a critical factor in the severity and cyclicity of BD. Uvais et al. found an association between bipolar episodes and exacerbated psoriatic lesions, likely due to the significant psychological stress of living with bipolar disorder (2020). Stress-related gastrointestinal disorders further emphasize the interconnectedness of mental health and gut health (Rudzki & Szulc, 2018).

Research implicates the GMB axis in the pathophysiology of mania, yet its role in immune dysfunction remains underexplored. Inflammatory mediators and neurotrophic factors seem to regulate gut microbiota and the central nervous system (CNS) in mania (de Miranda et al., 2020). In fact, de Miranda et al. identified the absence of certain gut microbiota as a potential protective factor against manic-like behavior, related to the downregulation of IL-6 and TNF-a and up-regulation of IL-10 in the CNS (2020). Given the proposed link between gut health and manic symptoms, further investigation into the GMB could offer insights into mitigating manic and hypomanic symptoms for individuals with BD. Understanding the relationship between stress and gut microbiota could unveil novel avenues for accessible and affordable home-based management strategies (Kesebir et al., 2020).

Prior research consistently reports higher levels of cytokines and chemokines in BD (Poletti et al., 2021), and lower levels of inflammatory cytokines were associated with neuroprotection in Zhang et al. (2019). While not the focal point of the current study, the identification of inflammatory markers to isolate causality and improve BD diagnostic tools does have clinical implications. Autoimmune psychosis is often misdiagnosed as psychotic and affective disorders like BD and Schizophrenia (Kesebir et al., 2020). Goodman et al. highlighted the importance of distinguishing mood disorders from autoimmune disorders like neuropsychiatric lupus (NPSLE) and emphasized the need for comprehensive evaluations to prevent misdiagnoses and ensure appropriate treatment (2022). A comprehensive clinical approach should involve both traditional diagnostic assessments and a thorough examination of family history, travel, and lifestyle factors to better understand the potential autoimmune involvement in the clinical manifestations of BD (Ramesh et al., 2021). Mitochondria may be able to predict transitions between BD episodes and help develop effective therapeutic options due to the link between dysfunctional mitochondria, inflammation, and BD clinical presentation (Angrand et al., 2021). Yet, practical challenges in incorporating immune panels in routine psychiatric assessments may limit the utility of identifying inflammatory markers. Clinicians should monitor peripheral inflammatory markers and profiles among susceptible individuals to evaluate the effects of BD treatment (Shen et al., 2023).

This review illuminated several significant gaps and critical future directions in research. Although de Miranda et al. (2020) propose the importance of a well-balanced diet among individuals with BD, further exploration of the Gut Microbiota Biome deserves further attention in mental health. With the robust amount of literature investigating and establishing inflammation-related pathways, researchers should shift focus toward developing comprehensive and holistic health practices for patients with BD at risk of developing autoimmune disorders. Significant associations between BD severity, childhood adversity, and lower quality of life prompt further investigation into potential emotional and non-pharmacological therapies (Congio

et al., 2022). Acknowledging the connection between early life adversity, inflammation, and bipolar episode severity holds promise for advancing approaches to addressing and preventing immune dysfunction among individuals with BD.

Several limitations in this systematic review should be addressed. In the interest of time, one researcher conducted an initial screening before retrieving articles from PubMed while the other researcher used the same approach with ScienceDirect. Delegating each database to one reviewer introduces risk for researcher and selection bias, limiting the strength of these findings. Additionally, generalizability was limited in three senses. Firstly, the use of animal models in two of the studies prompts concern about the translatability of findings to human populations (Zhang et al., 2019; de Miranda et al., 2020). Secondly, Zhang et al. and de Miranda et al. exclusively used male animal models, not considering the more complex hormonal systems among females. As autoimmune disorders are more prevalently observed in females than males, a deeper examination of hormonal, behavioral, and lifestyle influences is warranted (Boukouaci et al., 2018). Finally, this review excluded studies with participants younger than 18 or older than 65, restricting the generalizability of findings to older and younger populations.

Conclusion

This systematic review explored the complex link between inflammation, autoimmune diseases, and bipolar disorder (BD), highlighting the implications of immunological dysfunction in the pathogenesis and bidirectional relationship between autoimmune diseases and BD. While non-pharmacological health practices targeting BD-related inflammation were not identified, anti-inflammatory characteristics of medications utilized in BD treatment provide hopeful avenues for reducing immunological dysfunction and episode severity. Further research on the impacts of early trauma, stress, and lifestyle factors is necessary to establish a thorough understanding of immunological components in BD. Growing literature on interpersonal and lifestyle-related factors provides potentially critical directions for developing at-home health practices. Psychological stress, childhood trauma and adversity, and gut health highlight the importance of holistic approaches for patients in managing their health. Clinicians should assess patients for autoimmune disorders or immune dysfunction before providing any psychiatric diagnoses, especially in the presence of psychotic symptoms. Integrating accessible, non-pharmacological therapies into established clinical regimens is important in providing comprehensive care. Identifying at-home risk mitigation techniques has the potential to educate and empower patients with BD, thereby improving their treatment outcomes and overall quality of life.

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Tables and Figures

Table 1

PICOS: Eligibility Criteria

PICOS	Inclusion	Exclusion
Population	Adults 18-65 diagnosed with BD	Children; adolescents; those over 65; pregnant individuals or individuals with postpartum psychosis
Intervention / Assessment	Immune dysfunction among individuals with bipolar disorder	Bipolar disorder is not the primary psychiatric condition; not investigating inflammation related to immune dysfunction/autoimmune conditions;
Comparison	Inflammation related to immune dysfunction/autoimmunity in individuals with BD	Medications unrelated to the study's focus, unless exploring interaction between psychiatric medications and inflammation in BD
Outcomes	Results/implications for potential inflammation therapies/health practices	Findings not significant or related to inflammation and autoimmune disorders or immune dysfunction
Study Design	Studies with primary data; Experimental, cross-sectional, case studies/reports, or cohort	Meta-analyses, reviews, or systematic reviews

Figure 1

Identification of studies via electronic databases

Records identified from Electronic Search:
PubMed (n=106)
Science Direct (n=306)

Records removed before screening:
Duplicate records (n=11)

Records screened (n=401)

Records excluded (n= 353)

Reports sought for retrieval (n=59)

Reports excluded due to ineligibility (n=27)

Reports assessed for final selection (n=32)

Reports excluded with additional criteria: (n=26)

Total studies included in review (n=6)

Table 2

Summary of Study Characteristic

Study	Country	Study Design, Sample	Participants	Intervention/Treatment	Outcome
(Uvais et al., 2020)	India	Case Report, n=1	Female, 30 years BD and Psoriasis	Combined treatment of anticonvulsant, antipsychotic, and topical medications.	Significant improvement in manic and dermatological symptoms at two-week follow-up.
(Shen et al., 2023)	China	Case Report, n=1	Female, 43 years, BD, Behcet's, Sjorgen's	MRI, blood samples, and physical and psychiatric examinations. Initial therapy of benzodiazepine and antipsychotic. Adjusted to the combination of antipsychotics, corticosteroids, and immunosuppressives.	No improvement with the initial treatment. 2-weeks post-adjusted treatment: Serum immunological profiles normal, AID and BD symptoms improved. The patient emotional state was stable across 6-month follow-ups.
(Zhang et al., 2019)	China	Experimental (RCT), n=30	Male, Sprague-Dawley rats (250-350 g/each)	Group 1 and 2: Ouabain ICV injections induced mania. Group 1 received treatment, and Groups 2 and 3 received placebo. Locomotor activity was assessed in the open-field test.	Higher BDNF and INF-y levels in Group 3 than Group 2. INF-y, BDNF, and TLR3 reduction reversed in Group 1.
(de Miranda	Brazil	Experimental, n=unspecified	Male, germ-free (GF), and	Experimental group received GBR12909 injection to induce mania. Controls received saline	GF mice less susceptible to GBR12909-induced mania;

et al., 2020)			conventional Swiss mice	injection. Locomotor activity assessed in open-field test. Brain structures extracted and examined.	had lower levels of IL-6, TNF-α and increased IL-10, BDNF, NGF.
(Qi et al., 2023)	China	Longitudinal, n=4	2 Male and 2 Female with BD Depression	Combined treatment of anti-psychotics and anticonvulsants. PBMCs retrieved from participants before and 1-month post-treatment for ScRNA-sequencing.	B-cells decreased inflammation-related genes and pro-inflammatory cells. Ribosomal function decreased in B and T cells. Myeloid cell signaling pathways decreased.
(Angrand et al., 2021)	France	Case-control, n=492	Cases (n=312), HC (n=180)	Diagnoses established (French SCID for cases, French DIGS for controls). All patients were further evaluated. Blood samples for collected for genomic analysis.	Significantly lower mtDNAcn and elevated IL-6, IL-10, TNF-α, and sB2M levels in cases, especially the manic phase. Low mtDNAcn correlated with mania and psychotic symptoms.

Comorbid Complications and Risk Factors with Bipolar Disorder

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Abstract

Bipolar Disorder (BD) is the sixth leading cause of disability among adults globally. An estimated two-thirds of individuals with BD also experience other psychiatric conditions, including ADHD, anxiety, and substance use disorders. This study aimed to identify prevalent comorbid mental illnesses among those with BD and explore the risk factors. Deidentified survey data came from a convenience sample of 6,740 responses collected between 2020 and 2021 from TeleSage's SAGE-SR assessment. SPSS Statistics were used to perform descriptive analyses and logistic regressions between the independent variable, combined Bipolar-Disorders (cBD), and dependent variables ADHD, Cannabis Use Disorder (CUD), Alcohol Use Disorder (AUD), Opioid Use Disorder (OUD), and Combined Stimulant Use Disorders (CSUD). Results from the independent samples test suggested strong associations between cBD and ADHD, CUD, AUD, and OUD. Subsequent multinominal logistic regressions confirmed an increased risk of comorbid BD among individuals with ADHD, AUD, and CUD. Individuals with AUD were 1.38 times more likely, those with CUD over two times more likely, and those with ADHD were over five times more likely to have comorbid BD. Further research investigating risk factors and impacts of co-occurring BD, ADHD, and substance use is necessary to inform clinicians in tailoring diagnostic approaches and developing targeted treatment plans.

Keywords: Bipolar disorder (BD), psychiatric comorbidity, substance use disorders (SUD), ADHD

Introduction

Bipolar disorder (BD), also known as Bipolar Affective Disorder (BPAD), is a mood disorder characterized by marked, cyclical periods of mania or hypomania and depression (Dattani et al., 2021). These episodes are defined by significant and specific changes in mood, energy, and activity levels (Chen et al., 2022). Some individuals experience mixed states, or mixed episodes, fluctuating between high and low symptoms (Cleveland Clinic, 2022). Bipolar episodes can cause mild to severe disruptions in daily functioning and cognitive impairment, and difficulty in maintaining employment, social and familial relationships, stable living arrangements, and physical and emotional health (Grande et al., 2015). The main three subtypes are type 1 (BD-I), type 2 (BD-II), and cyclothymia (Grande et al., 2015). BD-I includes manic, hypomanic, and depressive episodes, although many primarily experience manic episodes (Chen et al., 2022). BD-II includes hypomanic and depressive episodes, with many primarily experiencing depressive episodes (Chen et al., 2022). Cyclothymia consists of shorter cycles of depressive and hypomanic symptoms (Chen et al., 2022). Other types include Other Specific Bipolar and Related Disorders, Unspecified Bipolar and Related Disorders, and those induced by substance use or medical conditions (Grande et al., 2015).

Comorbid Conditions

Bipolar Disorder (BD) is associated with a high prevalence of comorbid psychiatric and medical illnesses (Grande et al., 2016; Miller, 2016). It is estimated that up to two-thirds of individuals with Bipolar Disorder experience other psychiatric conditions, such as anxiety, substance use, or impulse control disorders (Miller, 2016). Other common psychiatric comorbidities include ADHD and OCD (Miller, 2016). OCD is one of the most chronic and difficult-to-manage comorbidities, often changing in tone with bipolar episodes (Amerio et al., 2016). A study conducted on the Danish population found that comorbid ADHD and anxiety increased the risk of Bipolar Disorder onset by 30 times compared to individuals with no prior ADHD or anxiety disorder diagnoses (Meier et al., 2018). Shared genetic influences are strongly implicated in ADHD and hypomania among adolescents, with a negligible effect of environmental influences (Moran et al., 2019). Even when controlling for overlapping symptoms of ADHD and hypomania, children diagnosed with ADHD have ten times the incidence of adolescent and adult-onset Bipolar Disorder (Moran et al., 2019). Childhood-onset anxiety disorders are also associated with a family history of Bipolar Disorder and prediction of Bipolar Disorder in familial studies (Meier et al., 2018).
Individuals with BD have 1.5 to three times the risk of developing comorbid medical illnesses (Chen et al., 2022). They are three times more likely to die prematurely, three-fourths of this due to a comorbid chronic medical illness (Levin et al., 2015). Other common underlying causes among individuals with BD include those related to cardiovascular disease (Watts, 2016; McIntyre et al., 2020), diabetes, and obesity (Grande et al., 2015). Comorbid BD and medical illnesses increase rates of attempted suicide, episode relapses, rehospitalizations, mood symptom severity, and number of lost life years (Chen et al., 2022). The risk of suicide attempts is much higher in individuals with comorbid ADHD and Bipolar Disorder (Moran et al., 2019). The mortality rate for adults in the U.S. with BD by suicide is up to an estimated 20 times higher than the general population, especially when left untreated (Grande et al., 2015).

Prevalence

Since 2010, Bipolar Disorder (BD) has been reported to affect between 1% and 3% of the population globally and is one of the main causes of disability among young adults (Grande et al., 2015). In 2017, there were an estimated 46 million individuals with Bipolar Disorder across the world (IHME, 2021). Yet, research on the disorder is surprisingly limited, and prevalence and incidence rates are often inconsistent across sources. The Cleveland Clinic reports an estimated 5.7 million adults in the U.S. are affected by BD, which is about 2.6% of the population (Cleveland Clinic, 2022). The National Alliance on Mental Illness (NAMI) reports that 2.8% of the U.S. population is affected by BD (NAMI, 2017). The Recovery Village reflects the prevalence rate reported by NAMI, referencing the Depression and Bipolar Support Alliance (DBSA) (2022). The DBSA webpage does not reflect this, reporting an estimated 5.7 million U.S. adults, or 2.6% of the U.S. population, and cites the National Institute of Mental Health (NIMH) (DBSA, 2019). However, the NIMH website reports a prevalence rate of 2.8% of the U.S. adult population, while including tables and graphics from 2001 to 2003, citations and references from 2001 to 2007, and a last review in August 2017 (NIMH, 2017).

Risk Factors and Health Outcomes

Bipolar Disorder (BD) is one of the most heritable psychiatric disorders and is understood to be caused by a combination of genetics and environmental influence (Grande et al., 2015). Studies conducted on twins have shown that 80% of children with an affected parent had an increased risk of bipolar symptoms and neurobiological abnormalities (Haggarty et al., 2021). Bipolar-related genes have been found to have incomplete overlaps with schizophrenia and other major psychiatric neurological disorders (Haggarty et al., 2021). Individuals with BD experience lifelong adverse health outcomes, including increased rates of relapse, initial and repeat hospitalizations, and attempted and completed suicide (Grande et al., 2015). Mortality rates from the CDC's Vital Statistics System were unreliable due to the small sample size (CDC WONDER, 2021). However, expanding parameters for the underlying cause of death to manic and depressive episodes yielded a rate of 0.2% in the U.S. from 2016 to 2020 (CDC WONDER, 2021).

Misdiagnoses among individuals with Bipolar Disorder are extremely common for many reasons, including incomplete psychiatric care history, limited patient insight, and comorbid health conditions (Perlis, 2005). One in five individuals receiving treatment in primary care settings for significant depressive symptoms or Major Depressive Disorder (MDD) likely has undiagnosed BD-I or BD-II, as do 20-30% of patients being treated for depressive and/or anxiety symptoms (Miller, 2016). This is partially because individuals usually seek care during depressive episodes and not during manic or hypomanic episodes (Kamat et al., 2008; Grande et al., 2016.) Misdiagnoses often worsen health outcomes, with ineffective treatments causing manic, mixed, or rapid-cycling episodes (Perlis, 2005).

Treatment

Due to the cyclical nature of Bipolar Disorder (BD), treatment is critical to manage and prevent episodes (Grande et al., 2015). Periods of remission and euthymia are possible with lifestyle changes and medication adherence, but recurring episodes remain highly likely (Grande et al., 2015). Pharmacological treatments include antipsychotics and mood stabilizers, often with concurrent anti-depressant use although this is approached with caution as they can induce hypomanic or manic states (Grande et al., 2015). Nonadherence to medication affects 20% to 80% of those receiving psychiatric care for BD, contributing to increased hospitalizations, relapse rates, violent or suicidal behavior, and increased healthcare costs (Levin et al., 2015). While few other standardized treatments are available, some research has investigated alternative approaches. Recent research on circadian rhythm has explored potential therapies for improving sleep quality, a common feature and symptom in BD. A small study targeting melatonin receptors found it beneficial for over 80% of participants, with few instances of hypomanic and manic episodes (Haggarty et al., 2021). Another study found that blue-light-reflecting glasses provided rapid anti-manic effects on participants with Bipolar Disorder within three days of continuous use in the evenings (Haggarty et al., 2021).

Hypothesis

Based on the reviewed literature, the null hypothesis stated: a) individuals with Bipolar Disorder (BD) are equally likely to have comorbid ADHD, Alcohol Use Disorder (AUD), Cannabis Use Disorder (CUD), Opioid Use Disorder (OUD), or Combined-Stimulant Use Disorder (CSUD)

compared to those without BD, and b) those with BD are equally likely to have ADHD, AUD, CUD, OUD, or CSUD as comorbidity.

Methods

Sample Information

This study retrieved sample data from the 2020-2021 SAGE–SR mental health assessment responses with permission from TeleSage. TeleSage is a behavioral health research and tech company that develops diagnostic assessments and tools to track patient-reported outcomes, evaluate treatments, and report to regulatory agencies (Brodey et al., 2018). Funded by the National Institute of Mental Health (NIMH) and National Institute of Drug Abuse (NIDA), TeleSage partners with top research universities and health organizations, including Stanford University, Yale University School of Medicine, National Institutes of Health, Healthscope, and St. Jude Children's Research Hospital (TeleSage, 2021). The SAGE–SR screens for diagnostic symptoms of the 31 most common behavioral health diagnoses and episodes using a comprehensive, online self-report assessment based on the DSM-V and SCID-5-Clinician Version (Brodey et al., 2018). The initial 65 questions cover symptoms from 13 diagnostic categories, including mood disorders, anxiety disorders, obsessive-compulsive and related disorders, trauma- and stressor-related disorders, neurodevelopmental disorders, psychotic disorders, and substance- related and addictive disorders (Brodey et al., 2018). Appropriate follow-up questions are selected based on answers to the initial 65 (Brodey et al., 2018). The SAGE-SR provides an intuitive report identifying the severity and degree to which ICD-10 diagnoses should be considered for further evaluation (TeleSage, 2021). The report is also compatible with the DSM-5. Clinicians can view their patients' reports and assessment item responses for subsequent evaluations of relevant symptoms and conclusions (TeleSage, 2021).

Sample Procedures

The initial data set included 6,801 responses, which were exported to a spreadsheet and removed any identifying information. Incomplete, incorrect, or missing data for birth year and gender were also removed from the dataset, along with the 65 initial questions and subsequent responses. The only remaining data on the Excel sheet were those reporting a diagnosis. Bipolar type 1 (BP1), Bipolar type 2 (BP2), and Other Specified Bipolar Disorder (OSBPD) were combined into one independent variable, Combined Bipolar Disorders (cBD), referred to as cBD in subsequent analyses and results. Stimulant Use Disorder-Amphetamine and Stimulant Use Disorder-Cocaine were combined into one dependent variable, Combined Stimulant Use Disorders (CSUD). Dependent variables included gender, Attention-Deficit/Hyperactivity Disorder (ADHD), Alcohol Use Disorder (AUD), Cannabis Use Disorder (CUD), Opioid Use Disorder (OUD), and CSUD. After identifying the relevant variables, all other diagnoses were removed from the dataset. The remaining responses were then coded as 0, to indicate no presence, or 1, to indicate the positive presence of a diagnosis. These revisions and removals reduced the sample size to 6,740 responses.

Data Analysis Techniques

Basic descriptive analyses were conducted in SPSS Statistics v25, beginning with cross-tabulations between the independent variable and each of the dependent variables. This was followed by an independent samples test with all dependent variables to assess each variable's confidence intervals and p-values. Results were considered statistically significant if the p-value was below 0.05 and the CI did not cross 1.0. Strong associations from the independent samples test developed the new hypothesis that those with cBD are more likely than those without cBD to have comorbid ADHD, AUD, CUD, or OUD. Individual logistic regressions were conducted between cBD and each dependent variable, using the 95% Confidence Intervals (CI) to identify statistically significant associations. A multinomial logistic regression was then conducted between the statistically significant dependent variables ADHD, CUD, AUD, OUD, and gender. Results were considered statistically significant if the p-value was below 0.05 and the CI did not cross 1.0. Variables with p-values below 0.05 were analyzed in another logistic regression both with and without gender, examining gender as a potential confounder.

Results

Sample Characteristics and Crosstabulations

Almost 39% of the total sample (N=6739) were males (n=2,622) and 61.1% were female (n=4,117). Those with Bipolar Disorder (BD) made up 11.86% of the sample, of which 34.3% were male and 65.8% were female, as shown in Table 1A. About 27.1% of the sample had ADHD, 26.7% of which also had BD. Conversely, 61% of those with BD also had ADHD. Results regarding ADHD are indicated in Table 1B. About 15% of the sample had CUD. Of those, 21.6% had comorbid BD. Conversely, around 27.3% of those with BD had a comorbid CUD. Results regarding CUD are indicated in Table 1C. About 12.6% of the sample had AUD. Of those, 16.2% had comorbid BD. Around 17.3% of those with BD also had an AUD. Results regarding AUD are indicated in Table 1D. About 2.2% of the sample had OUD. Of those, 20% had comorbid BD. Around 3.6% of those with BD had a comorbid OUD, as indicated by the results for CUD in Table 1E.

Independent Samples Test Results

The Independent Samples Test showed statistically significant associations between the independent variable, combined bipolar disorders (cBD), and the dependent variables ADHD, Cannabis Use Disorder (CUD), Alcohol Use Disorder (AUD), and Opioid Use Disorder (OUD) based on p-values <0.05. Levene's Test is used to assess if variances are equal between groups, testing the null hypothesis. The results of Levene's Test show that the variances are not equal, as indicated in the Equal Variance column of Table 1F, rejecting the null hypothesis. The independent samples test identifies the statistical significance of associations by p-values <0.05, as indicated in the Sig (2-tailed) column of Table 1F. Results from the t-test show significant associations between cBD and ADHD, AUD, and CUD. Results for the combined stimulant use disorders (CSUD) were insignificant. The p-values from the two-tailed test for OUD were <0.05 but varied from between equal variances assumed to equal variances not assumed, potentially indicating statistical invalidity.

Logistic Regression Results

Initial logistic regressions showed statistically significant associations between the independent variable, cBD, and the dependent variables AUD, OUD, ADHD, and CUD. This is based on the p-values <0.05 shown in Table 2A. A multinomial logistic regression, which included gender, showed statistically significant associations between cBD and AUD, ADHD, and CUD, as indicated by the p-values in Table 2B. A separate logistic regression was conducted without gender to test for potential confounding effects on OUD, but none were found. The multinomial logistic regression without OUD presented results consistent with the previous logistic regression, indicating statistically significant associations between cBD and AUD, ADHD, and CUD, as indicated in Table 2C. However, a slight overlap of CIs between AUD and CUD may suggest weak statistical associations.

Results can be interpreted as such: Males were almost 29% more likely to have a co-occurring Bipolar Disorder (BD). Those with an AUD were 1.38 times more likely to have a co-occurring BD. Those with a CUD were over 2 times as likely to have a co-occurring BD. Those with ADHD were over 5 times more likely to have a co-occurring BD. The results of the logistic regressions partially supported the new hypothesis. Individuals with alcohol use disorder (AUD), cannabis use disorder (CUD), and ADHD were more likely to have a comorbid Bipolar Disorder, especially those with ADHD.

Discussion

Despite increased awareness of common comorbidities in Bipolar Disorder (BD), few studies aim to gather updated data and prevalence estimates on conditions comorbid with bipolar. Even fewer studies focus on improving efficacy of diagnostic, treatment, and intervention plans targeting psychiatric comorbidities. The current study analyzed associations between BD and common comorbid conditions, including ADHD, Cannabis Use Disorder (CUD), Alcohol Use Disorder (AUD), Stimulant Use Disorders (CSUD), and Opioid Use Disorder (OUD), hypothesizing an increased likelihood of individuals with BD having one of the disorders as a comorbidity. The hypothesis was confirmed; individuals with AUD and CUD were more likely to have comorbid BD, and individuals with ADHD were five times more likely to have comorbid BD. This study contributes to the growing literature by clearly outlining the vulnerability of individuals with BD and ADHD in suffering from psychiatric comorbidities. Challenges in receiving dual diagnoses can be confusing and harmful, particularly for patients receiving inappropriate pharmacological treatment. Available treatments are often low quality and ineffective because of patient reluctance to share the full extent of symptoms and a general misunderstanding of multi-morbidities (Dattani et al., 2021). For example, similarities between unipolar and bipolar depression commonly lead to misdiagnosis (Perlis, 2005). This often results in patients entering manic or hypomanic episodes from use of anti-depressants without additional stabilizing medications (Grande et al., 2016). Similarly, individuals receiving stimulant treatment for ADHD without concurrent treatment for BD can experience manic episodes.

Comorbid conditions often antagonize and exacerbate each other, which is especially dangerous in the case of Bipolar Disorder. Individuals with BD require acute levels of care and treatment to maintain stability in social, personal, and career-related spheres. Routine and consistency, which are critical in preventing and managing bipolar episodes, play an equally crucial role in treatment adherence (Levin et al., 2015). Individuals with comorbid ADHD face additional challenges, as hyperactivity can disrupt sleep patterns and inhibit treatment adherence. Additionally, those with ADHD often experience symptoms similar in appearance to depression and hypomania, such as

executive dysfunction and dopamine-seeking behaviors which impact long-term employment and planning capabilities. Substance use also increases risk for manic episodes and psychosis, especially with psychedelics and stimulants. Clinicians should consider the use of substances, especially cannabis use, as a coping mechanism or self-medication for underlying or untreated BD and comorbid psychiatric conditions. Identifying and treating BD should be the primary concern before beginning treatment through recovery or rehabilitation programs.

There is a clear need for comprehensive psychiatric care and assessments approached from multi-morbidity perspectives instead of dual or single approaches (Bhalla & Rosenheck, 2017). Without proper diagnosis and treatment, individuals with chronic psychiatric comorbidities will continue to suffer relapses, severe episodes, early deaths, and increased disability-affected life years (DALYs). Clinicians can improve diagnostic accuracy by incorporating longitudinal assessments in differential evaluations, addressing patient physical health, and evaluating treatment adherence for both mental and physical medical conditions (Grande et al., 2016; Watts, 2016). Future research should examine the relevant risks and relationships between BD and other comorbid conditions. These risks should be considered when developing tailored treatment plans through a multi-morbidity approach. Studies should also explore potential non-pharmacological treatment options to address additional issues such as sleep disturbance and interference in treatment adherence.

There are some limitations to this paper, largely related to the sample. First, the SAGE-SR does not provide official diagnoses; symptoms are self-reported and endorse potential disorders of low, medium, and high concern. For the 2020-2021 data set, the presence of a disorder is only counted when the symptoms endorsed by possible differential diagnosis are present and meet the DSM-5 criteria. Some individual reports may have presented diagnoses of medium concern that would not have met the threshold to be reported present on the analyzed dataset. Secondly, the SAGE-SR dataset was limited to 31 disorders and episodes, not including personality disorders, physical medical comorbidities, or any initial intake. The SAGE-SR has since been updated and includes a separate general intake and additional assessment for personality disorders. Thirdly, this study focused on ADHD and substance use disorders but did not explore other potential comorbidities that could have altered the odds ratios. As noted in the literature, anxiety disorders and obsessive-compulsive related disorders are prevalent diagnoses within BD. Future analyses should include these common comorbidities, as well as genetically similar conditions such as schizophrenia (Amerio et al., 2016; Miller, 2016). (TeleSage, 2023)

Conclusion

Bipolar disorder (BD) is a severe and disabling mental illness that impairs cognitive functioning and quality of life for millions of people. Despite this, few studies have examined preventative efforts or comprehensive interventions designed to support individuals with BD in managing complex differential diagnoses. This study aimed to identify common comorbid mental illnesses and respective risk factors among individuals living with BD. Findings were congruent with existing literature, identifying an increased likelihood of comorbid ADHD, Alcohol Use Disorder (AUD), and Cannabis Use Disorder (CUD) among individuals with BD. Further research investigating the risks and relationship between comorbid ADHD and BD is critical to developing effective treatments tailored to their unique health challenges and outcomes. Moreover, comorbid conditions can exacerbate morbidity, worsening already adverse health outcomes for the BD population. An advanced understanding will improve clinical diagnostic assessments and support

the development of targeted clinical interventions. AI-informed self-report assessments are relatively new and may prompt some validity-based concerns. As a known entity and tunable diagnostic, the SAGE-SR presents promising improvements in diagnostic accuracy through its multi-comorbidity approach to symptom severity and profile presentations. As BD is highly sensitive to disruptions and changes, standardized interventions, and assessments are needed to mitigate health risks and prevent further adverse outcomes. By informing clinicians and developing tailored diagnostic approaches and treatment plans, individuals with BD can be effectively treated earlier on, reduce morbidity and mortality, and improve their overall quality of life.

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Tables
Table 1A
Crosstabulation of BD & Gender

Gender		Bipolar Disorder		Total
		No	Yes	
Male	n			2622
	% within males	89.6%	10.4%	100.0%
	% within BD	--	34.28%	38.9%
Female	n			4117
	% within females	87.2%	12.8%	100%
	% within BD	--	65.72%	61.1%
Total	n	5940	799	6739
	% within males and females	88.14%	11.86%	100.0%

Table 1B
Crosstabulation of BD & ADHD

Bipolar Disorder		ADHD		Total
		No	Yes	
No	n	4603	1337	5940
	% within BD	77.5%	22.5%	100.0%
	% within ADHD	93.7%	73.3%	88.1%
Yes	n	312	487	799

	% within BD	39.0%	61.0%	100.0%
	% within ADHD	6.3%	26.7%	11.9%
Total	n	4915	1824	6739
	% within BD	72.9%	27.1%	100.0%

Table 1C

Crosstabulations BD & Cannabis Use Disorder (CUD)

Bipolar Disorder		Cannabis Use Disorder		Total
		No	Yes	
No	n	5149	791	5940
	% within BD	86.7%	13.3%	100.0%
	% within CUD	89.9%	78.4%	88.1%
Yes	n	581	218	799
	% within BD	72.7%	27.3%	100.0%
	% within CUD	10.1%	21.6%	11.9%
Total	n	5730	1009	6739
	% within BD	85.0%	15.0%	100.0%

Table 1D

Crosstabulations BD & Alcohol Use Disorder (AUD)

Bipolar Disorder		Alcohol Use Disorder		Total
		No	Yes	
No	n	5228	712	5940
	% within BD	88.0%	12.0%	100.0%
	% within AUD	88.8%	83.8%	88.1%
Yes	n	661	138	799
	% within BD	82.7%	17.3%	100.0%
	% within AUD	11.2%	16.2%	11.9%
Total	n	5889	850	6739
	% within BD	87.4%	12.6%	100.0%

Table 1E

Crosstabulations BD & Opioid Use Disorder (OUD)

Bipolar Disorder		Opioid Use Disorder		Total
		No	Yes	
No	n	5824	116	5940
	% within BD	98.0%	2.0%	100.0%
	% within OUD	88.3%	80%	88.1%
Yes	n	770	29	799
	% within BD	96.4%	3.6%	100.0%
	% within OUD	11.7%	20.0%	11.9%
Total	n	6594	145	6739

	% within BD	87.4%	12.6%	100.0%

Table 1F

Independent Samples Test

Variable	Equal Variance	Levene's Test for Equality of Variances		t-test for Equality of Means		95% Confidence Interval	
		F	P-value (Sig.)	t	(Sig., 2-tailed)	Lower	Upper
Gender	Assumed	47.35	<.001	-2.929	0.003	-0.090	-0.018
	Not assumed			-2.996	0.003*	-0.089	-0.019
ADHD	Assumed	238.1	<.001	-23.913	<.001	-0.416	-0.353
	Not assumed			-21.239	<.001*	-0.420	-0.349
AUD	Assumed	64.53	<.001	-4.230	<.001	-0.077	-0.028
	Not assumed			-3.767	<.001*	-0.080	-0.025
CUD	Assumed	325.1	<.001	-10.471	<.001	-0.166	-0.114
	Not assumed			-8.531	<.001*	-0.172	-0.108
OUD	Assumed	36.85	<.001	-3.068	0.002	-0.027	-0.006
	Not assumed			-2.444	0.015*	-0.030	-0.003
CSUD	Assumed	17.59	<.001	-2.088	0.037	-0.041	-0.001
	Not assumed	47.35	<.001	-1.758	0.079	-0.045	0.002

*Variables found statistically significant

Table 2A

Logistic Regressions of Significant Dependent Variables and Bipolar Disorder (BD)

Variables	P-Value (Sig.) *	Odds Ratio	95% Confidence Interval (CI)	
			Lower Bound	Upper Bound
AUD	<.001	1.533	1.256	1.871
OUD	0.003	1.891	1.25	2.86
ADHD	<.001	5.374	4.604	6.272
CUD	<.001	2.442	2.055	2.903

*Variables found statistically significant

Table 2B

Multinomial Logistic Regression with Bipolar Disorder (BD) and AUD, OUD, ADHD, and CUD

Variables	P-Value (Sig.) *	Odds Ratio	95% Confidence Interval (CI)	
			Lower Bound	Upper Bound
AUD	.004*	1.370	1.103	1.701
ADHD	<.001*	5.054	4.322	5.909
Gender [c]	.002*	1.292	1.096	1.522
CUD	<.001*	1.993	1.652	2.406
OUD	.109	1.445	.921	2.268

[c] Referencing male participants

*Variables found statistically significant

Table 2C

Multinomial Logistic Regression with Bipolar Disorder (BD) and AUD, ADHD, and CUD

Variables	P-Value (Sig.) *	Odds Ratio	95% Confidence Interval (CI)	
			Lower Bound	Upper Bound
AUD	.004	1.375*	1.108	1.707
ADHD	<.001	5.065*	4.332	5.922
Gender [c]	.003	1.287	1.092	1.517
CUD	<.001	2.022*	1.677	2.438

[c] Referencing male participants

*Variables found statistically significant

Using The Civil Rights Era as A Baseline to Teach About the Social Movements of Today

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Abstract

Over the past several years, numerous sources in the popular press have noted that the Civil Rights Movement has been undertaught in K-12 school districts across the United States. This review attempts to illuminate this problem further and offer a few ways to negate it by way of individual assignments created by the author. It also attempts to offer a way to remedy this problem through a teaching rubric created by the Southern Poverty Law Center. The Southern Poverty Law Center's rubric can also serve as a guide when teaching students about contemporary social movements.

Keywords: Civil Rights Movement, rubric, undertaught, Southern Poverty Law Center

Introduction

It is well documented in the fields of K-12 education, higher education, American history, and sociology that the Civil Rights Movement is undertaught in most school systems around the United States (Southern Poverty Law Center, 2011; Schulten, 2012; Frost, 2012; Alhumam, 2015; Russell, et al., 1998; Gersten, et al., 2006). This has been a social problem for many reasons. First, it brings numerous consequences to students who are trying to understand how and why social movements occur. Second, it is an important era of U.S. history for young people to understand how African Americans have struggled to acquire their Civil Rights in society. Third, students have no frame of reference because a lot of American history, including the Civil Rights Movement of the 1950s and 1960s, is not being taught in classrooms across the country. This is impacting students negatively because when they are studying the social movements of today, they have no "rubric", no "model", no "example" to teach them about how and why social movements work. Numerous articles in the popular press explain this fact (Dunn, 2005; Dallmer, 2007; Southern Poverty Law Center 2011 and 2014; Frost, 2012; Schulten, 2012; Brown, 2015).

Problem

The problem is the Civil Rights Movement is not being adequately taught in elementary schools, middle schools, high schools, and at colleges and universities (Buchanan, 2015; Anderson, 2018; Combs and Skipper, 2014; Dillon, 2011; Hale, 2018; Pass and Campbell, 2006). This relevant educational topic has been examined numerous times. There are countless studies reviewing this topic. A majority of the articles were written between 1998 and 2015. As a result of the Civil Rights Movement not being taught, students have no frame of reference for understanding how today's social movements operate, their purpose, and their strategies.

Strategy

The purpose of this paper is three-fold. Firstly, it is necessary to frame the problem of The Civil Rights Movement being undertaught. This will be achieved by discussing some of the

content from articles in the popular press and summarizing the various reasons as to why this era in American history seems to be forgotten. Secondly, present the only instrument in the literature that attempts to resolve this gap in history. The instrument comes from the Southern Poverty Law Center in Montgomery, Alabama.

When examining the literature for this paper, there were few solutions and no assessment instruments offered to solve the problem of the lack of teaching the Civil Rights Movement in schools across the country. This paper outlines the content of this six part instrument to help resolve the issue. Each of the six sections will be discussed and reviewed in great detail. Thirdly, the author of this paper would like to offer a couple of solutions (assignments) that have been created for classrooms to better teach the Civil Rights Movement. The assignments are based on the six criteria set forth by The Southern Poverty Law Center's rubric (2011). This gets to the crux of the paper, which is using the time era of the Civil Rights Movement to teach our students about the mistreatment of African Americans, and to teach about how social movements work in our society.

Review of Literature

As stated previously, the bulk of the literature found for this research was written between 1998 to 2015. Scholars in numerous fields, including higher education, history education, sociology, and law have carefully studied the problem of the Civil Rights Movement being undertaught in U.S. classrooms (Cook, 2005; Schulten, 2012; Hamlin, 2016; Dunn, 2005; Stewart et al., 2015). In the following section, a brief overview of the top four reasons why this time era is so undertaught is explained. A review of literature follows.

States are not making it mandatory in the curriculum

Simply stated, teaching the Civil Rights Movement has not been mandated in all 50 states (Dunn, 2005; Dillon, 2011; Southern Poverty Law Center, 2011, pp. 9-10; Frost, 2012; Schulten, 2012).

Teachers are not qualified

It was stated in the literature, that many teachers who were not qualified to teach history in K-12, were forced to teach it because of teachers quitting, the teaching shortage, budget cuts, and other circumstantial reasons. Numerous teachers who do not even have a minor or major in history, have been tasked with teaching history in their schools. Many of them felt unqualified to do so, and believed they did not know enough to adequately cover the Civil Rights Movement (Dillon, 2011; Russell, et al., 2011; Southern Poverty Law Center, 2011, pp. 9-10; Hamlin, 2016).

No Child Left Behind=Not enough instructional time

This paper's purpose is not about examining the pros and cons of the No Child Left Behind Act of 2002. However, it is safe to say that some scholars studying the Civil Rights Movement and teachers in grades K-12, believe its focus on standardized testing and teaching basic skill sets certainly does not encourage teaching about the events of this time era. Further, many academic disciplines in schools have been reduced since the No Child Left Behind was implemented,

especially social studies and history (Dillon, 2011; Southern Poverty Law Center, 2011; and Anderson, 2018).

No Agreed Upon Curriculum

Presently, no official national standard exists, making it mandatory to teach the Civil Rights Movement, its purpose, and strategies in schools across the country. The only instrument remotely close to achieving these things is the Southern Poverty Law Center's six category rubric. (Southern Poverty Law Center, 2011; Anderson, 2018; Pass and Campbell, 2006; Foster et al., 2015). An explanation of the rubric follows.

Southern Poverty Law Center Rubric

Both in 2011 and 2014, the Southern Poverty Law Center developed a rubric; the only rubric discovered in the literature offering guidance on how to adequately teach the Civil Rights Movement. This section focuses on the most recent rubric devised in 2014 and its six categories. Each category explains the minimal expectations for teaching the Civil Rights Movement for that section. The Southern Poverty Law Center reminds readers that these six categories and the suggested teaching content within them, is merely a reasonable starting point. A review of the six categories follows.

Events

The Southern Poverty Law Center criteria states that students should be able to identify key events in the civil rights movement and place them in correct chronology. These events include: *Brown v. Board of Education*; Little Rock 9; Freedom Rides; Montgomery Bus Boycott; 24th Amendment; Birmingham bombings and protest; March on Washington; 1964 Civil Rights Act; Freedom Summer; Selma-to Montgomery-March; 1965 Voting Rights Act; uprisings such as Watts, Cicero, IL and riots in Detroit, MI; 1968 Civil Rights Act; and the assassination of Martin Luther King Jr. Students should also be able to identify the causes and consequences of these events, linking key figures and organizations to each event (Southern Poverty Law Center, 2014).

Leaders

The Southern Poverty Law Center criteria states that the civil rights movement was a movement composed of many individuals and was not the initiative of any single person or small group of people. All students learn about Martin Luther King Jr. and Rosa Parks, but students should learn about at least six additional people from the civil rights movement (Southern Poverty Law Center, 2014).

Groups

The Southern Poverty Law Center criteria states students should be able to identify major groups include: CORE, SCLC and SNCC. Students should be able to explain the mission and accomplishments of each group as well as trace the relationships among groups (Southern Poverty Law Center, 2014).

Causes of the movement

The Southern Poverty Law center criteria states students should be able to trace the roots of the civil rights movement to slavery and disenfranchisement through the Civil War and Reconstruction. They should learn about Jim Crow laws, poll taxes and literacy tests. They should understand the complex causes of President Harry S. Truman's decision to desegregate the U.S. military, including A. Philip Randolph's role (Southern Poverty Law Center, 2014).

Opposition to its successes

Students should identify opposition to the civil rights movement's success. They should learn the difference between *de jure* and *de facto* segregation and examine the extra-judicial enforcement of segregation through diverse tactics such as the formation of White Citizens' Councils and the Ku Klux Klan. Students should be able to identify key figures and groups opposing the extension of civil rights, including Bull Connor and one of the major opposing Southern governors: Orval Faubus, George Wallace, J. Lindsay Almond, and Ross Barnett (Southern Poverty Law Center, 2014).

Tactics

Students should be able to explain the advantages and disadvantages of nonviolent resistance. They should be able to discuss the role of civil disobedience in a democratic society. They should identify and compare tactics and ideas such as boycotts, sit-ins, marches, voter registration and Black Power, used at different times during the struggle for civil rights (Southern Poverty Law Center, 2014).

Discussion of SPLC Rubric

As mentioned previously, a plethora of academic research has discussed the Civil Rights Movement time era in terms of covering topics such as racism, abuse by law enforcement officers on Black Americans, teaching leadership, teaching young children, and teaching high school children. The approach in this research is different.

The primary aim of the literature search in this study is to locate a model or rubric that could both improve the teaching of the Civil Rights Movement to students, and help students retain a better understanding of that time era. The only model or rubric discovered came from the Southern Poverty Law Center. There was a rubric introduced in 2011. It was then upgraded. The second, more comprehensive rubric was unveiled in 2014. This paper focuses on the contents within the 2014 rubric.

The rubric addresses six key categories to better understand a social movement, specifically the civil rights movement. The categories in the 2014 rubric include: leaders, groups, key events, causes of social movements, opposition to the movement's successes, and tactics employed. In fact, this rubric is an instrument that can be used to teach about social movements for virtually any group.

Attached at the end of this paper, are a couple sample assignments crafted by the author of this paper. The assignments are created from the original "Eyes on the Prize" series, which is a 14 part series created by PBS between 1979-1985 (Hampton, 2006). Each of the 14 films cover specific

events caught by news media between 1954 and 1968 related to the Civil Rights Movement. These assignments can be found in Appendix A.

As stated previously, the Southern Poverty Law Center recommends a six-category rubric for teaching the Civil Rights Movement. The six recommended categories can also be applied to teaching about the social movements of other marginalized groups in American society, including: Hispanic Americans, Native Americans, Asian Americans, and the LGBTQIA+ community.

Conclusion

The purpose of this paper is to examine numerous journal articles on the topic of the Civil Rights Movement of the 1950s and 1960s, and how to better teach about this era in our classrooms. Another objective was to find a "model" or "rubric" that could improve teaching key content from the Civil Rights Movement to our students in a meaningful way. The rubric from the Southern Poverty Law Center in Montgomery, Alabama offers a solid way to not only teach our students about the Civil Rights Movement in a sincere manner, but can also be used as a way to approach teaching other social movements.

When the Southern Poverty Law Center conducted its last study in 2014, it ranked states on an A-F scale based on the criteria set forth in the 2014 rubric. The Southern Poverty Law Center has not conducted a similar study since 2014. In the last study, the following results were determined. Only three states earned a grade of "A" in teaching the Civil Rights Movement; eight states earned a grade of "B"; five states, including the District of Columbia earned a grade of "C"; fourteen states earned a grade of "D"; and twenty states earned a grade of "F" (Southern Poverty Law Center, 2014). More detail on which states scored at a grade of "A", "B", or "C" can be viewed below.

The three states earning an "A" grade included: South Carolina, Louisiana, and Georgia. The eight states receiving a grade of "B" included: Maryland, North Carolina, Alabama, Virginia, Oklahoma, California, New York, and Florida. The five states earning a grade of "C" included: Tennessee, Kansas, Mississippi, Arkansas, West Virginia, and the District of Columbia (Southern Poverty Law Center, 2014). To put this into perspective, only 16 states out of 50 scored an "A", "B", or "C" according to the standards set forth by The Southern Poverty Law Center (Southern Poverty Law Center, 2014). To summarize, this means exactly 32 percent of states in the country were teaching the civil rights movement at a sufficient level.

The standards set forth in the Southern Poverty Law Center's rubric are lofty but attainable. Perhaps what makes the six categories of learning from the Southern Poverty Law Center's rubric so special, is that they are so well-constructed that they can be applied to teaching any social movement. Student retention in learning about the Civil Rights Movement or any social movement for that matter, could be enhanced by following this rubric.

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Appendix: A

•   **The two assignments in this paper are related to film**

*Before viewing specific segments of each "Eyes on the Prize" video, I provide my students with 5 to 8 discussion points, i.e., (leaders, events, groups, tactics and maybe things students have never heard about before such as "White Citizen's Councils"). I have created the discussion point assignments on my own, following the Southern Poverty Law Center's 2014 rubric and for all 14 videos of the "Eyes on the Prize" series.

**After discussing what to look for with the 5 to 8 discussion points prior to viewing video segments, I hand out a fill-in-the-blank assignment (of my own creation) for the students to complete for credit. I have created all of the "Eyes on the Prize" assignments myself based on the suggested criteria from the Southern Poverty Law Center's 2014 rubric.
   We then go over the fill-in-the blank assignment and have dialogue on the 5 to 8 discussion points for each

Discussion Points for: "Eyes on The Prize: Awakenings 1954-1956"

•   Brown vs. Board of Education of Topeka, Kansas 1954
•   Emmett Till
•   Rosa Parks
•   Dr. and Rev. Martin Luther King, Jr.
•   How did White leaders retaliate against Black leaders who said it was unconstitutional to have bus segregation?
•   What role did White women in Montgomery, AL play during the bus boycott?

Eyes On the Prize
Awakenings
1954-1956

Directions: This is an assignment you are to complete independently during the documentary. You should fill in the answers to the best of your ability. Most of the answers are only one to four words. Each question is worth .5 (or ½) of a point. *For example*, 16 questions would equal 8 points.

•   What was the "prize" that Blacks were fighting for? _____**freedom**_____

•   _**Segregation**_____ was the context for blacks' lives throughout the country, but especially in the South.

•   ___**World War II**_____ brought great hope for social change in the United States. They fought and died in a segregated military.

- On May 17th, 1954, the Supreme Court ruled in what court case that segregated schools were unconstitutional? **Brown vs. Board of Education of Topeka, KS**

- **Emmett Till** came down to Mississippi from Chicago to visit relatives and was murdered because he talked "fresh" to a white woman in a store. He said "Bye Baby" to the white woman. (It was later discovered that Emmett Till did not say this).

- What was the name of the Black Congressman who came to Sumner, Mississippi to trial of the men who killed the young black child? **Charles Diggs**

- Over the years there have been over **500** documented lynchings in Mississippi alone.

- **Montgomery**, Alabama prides itself on being called "The Cradle of the Confederacy."

- In December of 1955, **Rosa Parks** refused to give her seat to a white man while riding on a bus in Montgomery, Alabama.

- Which Black leader from Atlanta, Georgia did black leaders from Montgomery, Alabama want to continue the leadership of the bus boycott in Montgomery? **Dr. and Rev. Martin Luther King, Jr**.

- Martin Luther King, Jr. said the best thing to do with your enemy is to make them your **friend**

- How did white leaders retaliate against Black leaders who said it was unconstitutional to have bus segregation? **By indicting almost 90 Black leaders under an old anti-boycott law.**

- Which group of people would pick up black people and give them rides to work or to their homes because blacks were boycotting the busing system in Montgomery, Alabama? **white women**

- On November 13th, **1956**, the U.S. Supreme Court broke the deadlock ruling unanimously that Montgomery's bus segregation was unconstitutional.

- How many months did the Montgomery bus boycott last? **11**

- After the boycott ended, where did Blacks want to sit on the bus? **in the front**.

***Upon completion of the documentary and fill-in-the-blank assignment, we go over the answers to this assignment and then have robust discussion about the 5 to 8 discussion points I asked them to pay attention to prior to viewing the documentary.

Discussion Points for: "Eyes on The Prize: Fighting Back 1957-1962"

•   Brown vs. Board of Education of Topeka, KS 1954
•   14th amendment
•   Governor Orval Faubus; Governor Lindsay Almond; and Governor Ross Barnett
•   Little Rock 9
•   James Meredith and Autherine Lucy
•   President John F. Kennedy's role in both the Civil Rights Movement and getting James Meredith enrolled at Ole Miss.

Eyes On the Prize
Fighting Back
1957-1962

Directions: This is an assignment you are to complete independently during the documentary. You should fill in the answers to the best of your ability. Most of the answers are only one to four words. Each question is worth .5 (or ½) of a point. *For example*, 12 questions would equal 6 points.

•   Which Mississippi politician said: "All the people of the South are in favor of segregation and Supreme Court or no Supreme Court, we're going to maintain segregation." **James Eastland**

•   Under what Supreme Court ruling was it determined illegal to segregate students under the Constitution? **Brown   vs.   Board   of   Education   of   Topeka,   KS 1954**   . Which Amendment stated that segregated schools are unconstitutional?   **14th**   .

•   Southerners felt integration attacked their   **heritage/traditions**   .

•   Which Governor of Arkansas deployed the National Guard to prevent the Black students from entering Central High School in Little Rock, Arkansas in 1957?
  Orval Faubus

•   What was the name given to the nine students from Little Rock, Arkansas who were trying to go to Central High School?   **"Little Rock 9"**

•   How well were the military men who protected the nine Black students received by the black students?   **well/good**

•   What action did Lindsey Almond, Governor of Virginia, do to prevent both Black students going to public schools with Whites and to avoid having federal troops from coming into the state of Virginia to patrol the schools?   **He closed many of the schools**

•   What was the name of the black man who was initially denied admission to The University of Mississippi (Ole Miss)?   **James Meredith**

•   What was the name of the obstinate Governor of Mississippi who claimed he was a proud Mississippi segregationist? He also vowed no public school in Mississippi would be integrated   **Ross Barnett**

•   **True** or False (**please circle one**). The Governor of the State of Mississippi met the black student in person at Ole Miss when he tried to register for classes and denied him admission to Ole Miss.

•   What happened on Ole Miss's campus at 8 p.m. after they found out Meredith was on campus about the same time Kennedy was on television speaking to the United States about violating Civil Rights?   **rioting and violence broke out**

•   Which two people did the documentary state ultimately won the battle on the Ole Miss campus?   **JFK and Meredith**

***Upon completion of the documentary and fill-in-the-blank assignment, we go over the answers to this assignment and then have robust discussion about the 5 to 8 discussion points I asked them to pay attention to prior to viewing the documentary.

Analysis of Consumer Perceptions of Chick-fil-A

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Abstract

The objective of this paper is to analyze consumer perceptions of Chick-fil-A and provide meaningful conclusions and recommendations to management to improve its appeal to consumers. While Chick-fil-A has a positive reputation, management can use this paper to evaluate and improve Chick-fil-A's overall satisfaction.

Data for the project was collected via a questionnaire, which included both Likert and demographic questions, to get a better understanding of customers' perceptions of Chick-fil-A and Popeyes. Using Qualtrics, 318 responses were collected from family, friends, and colleagues around Georgia.

Approximately 84% of the surveyed respondents believe that, overall, Chick-fil-A is a better restaurant compared to Popeyes. The research indicates that this sample is representative of Georgia's population in terms of gender, but not in terms of race.

Independent sample T-tests showed that respondents value Chick-fil-A more than Popeyes. They strongly believe that Chick-fil-A offers a quick meal, offers quick service in the drive-thru line, and overall is a great dining experience. Many also agree that they are regulars at Chick-fil-A, and that it offers healthy options, a good variety of options, and an inexpensive meal.

Regression analysis showed that overall satisfaction with Chick-fil-A's service was dependent on the overall customer perception that Chick-fil-A is a great dining experience. Managerial recommendations included that Chick-fil-A add a value menu, gather more input from their male customers, expand business hours to being open 7 days a week, and expand their clientele to the African American community through advertising campaigns.

Key terms: Consumer perceptions, comparative marketing, actionable analytics

Analysis of Consumer Perceptions of Chick-fil-A

Truett Cathy founded Chick-fil-A in 1967, opening the first restaurant in Atlanta's Greenbriar Shopping Center. Apart from Alaska, Hawaii, and Vermont, customers can find a Chick-fil-A restaurant at over 3,000 locations in the United States, (Chick-fil-A History, n.d., Wikipedia Chick-fil-A, n.d.). This company prides itself on quick service, pleasant dining experience, and easily accessible areas. Their company policies and kind employees add to the restaurant's atmosphere, and their drive-thru allows for a quick dining service. Chick-fil-A is independently franchised, creating locally owned small businesses dedicated to serving their communities. Chick-fil-A is a fast-food establishment that faces competition from others that offer similar experiences. Quality and price are often deciding factors for many customers.

To gain more insight into Chick-fil-A's fast-food restaurant industry market share, this Business Research team chose to analyze how it compares to Popeyes. Popeyes is a fast-food restaurant that

serves chicken flavored in Cajun spices. Popeyes has over 3,400 stores spanning over 29 countries. Their most notable menu item is the Popeyes Chicken Sandwich, which made news and media headlines during 2019 and 2020. Popeyes prides itself in increasing franchisee success in every facet of the business.

An in-depth research study of Chick-fil-A was completed to see which areas customers are satisfied with, which areas are lacking and needing improvement, and which areas Chick-fil-A is succeeding. Chick-fil-A's results were then compared to Popeyes's results, and managerial conclusions were drawn about each restaurant. Results from approximately 318 respondents were analyzed to arrive at many meaningful conclusions. These conclusions will help Chick-fil-A continue and grow as a successful restaurant and gain more insight into its competitors.

Methodology

The first page of the Qualtrics questionnaire was a disclaimer page that outlined the reason for the survey and assured the respondents that all responses were anonymous and confidential. The first four questions focused on the demographics of the respondents. These questions included inquiries about race/ethnicity, gender, and whether the respondent had ever eaten at Chick-fil-A or Popeyes. There were two open-ended (ratio-scaled) questions about visiting and spending habits at Chick-fil-A. The demographic questions allowed the team to relate the sample to Georgia's population and Chick-fil-A's customer base. The rest of the questionnaire consisted of (26) 5-point Likert scale questions that inquired about Chick-fil-A and Popeyes restaurant speediness, price, accessibility, variety, healthy options, and pleasant dining experience. The questionnaire totaled 32 questions and is provided in the Appendix.

To create the questionnaire, the team used Qualtrics. Qualtrics is a survey website that creates a shareable link that allows for easy data collection. This link was sent out via email, text message, and social media. Some responses were also collected from other students on campus. Between these methods, 318 usable responses were collected. These responses were then integrated into the Statistical Package for Social Sciences (SPSS).

Once the results were integrated into SPSS, an in-depth analysis was completed. The analytical methods included T-Tests of one proportion, one mean, and differences between means, chi-squared tests, correlations, and regressions. These results are provided in this paper. Some results are also shown in bar chart form and pie chart form. The purpose of the analysis was to provide meaningful managerial recommendations to Chick-fil-A.

The References section at the end of this paper does include five references relevant to this work. In applied business research that focuses on practical managerial conclusions, there is not typically the emphasis on an extensive literature review, as is more common in other social science research, so the hope is that the points allocated to references and citations can be allocated to the modest number of citations in the text and References section plus other dimensions of evaluation.

It is important to point out that, aside from some missing observations, the final data set used in this paper consisted of *more than 10,000 data points* (318 responses times 32 questions). The focus was on using actionable analytics to create meaningful information from this substantial data set and provide practical conclusions to improve the business and thus benefit the local community.

Analysis

The 318 responses were analyzed using the Statistical Package for the Social Sciences (SPSS).

This Analysis section is organized into the following sub-sections:
- Data Summary
- Hypothesis Tests or T-Tests of: (i) One Proportion, (ii) One Mean, and (iii) Differences Between Means
- Tests of Association: (i) Chi-Square tests, (ii) Correlations, and (iii) Regression

Race:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Black/African American	150	47.2	47.3	47.3
	White/ Caucasian	132	41.5	41.6	89.0
	Hispanic	16	5.0	5.0	94.0
	American Indian/ Alaskan Native	2	.6	.6	94.6
	Asian/ Pacific Islander	5	1.6	1.6	96.2
	Other	12	3.8	3.8	100.0
	Total	317	99.7	100.0	
Missing	System	1	.3		
Total		318	100.0		

Data Summary

Race:

- Black/African American
- White/ Caucasian
- Hispanic
- American Indian/ Alaskan Native
- Asian/ Pacific Islander
- Other

3.79% Other
1.58% Asian/ Pacific Islander
0.63% American Indian/ Alaskan Native
5.05% Hispanic
47.32% Black/African American
41.64% White/ Caucasian
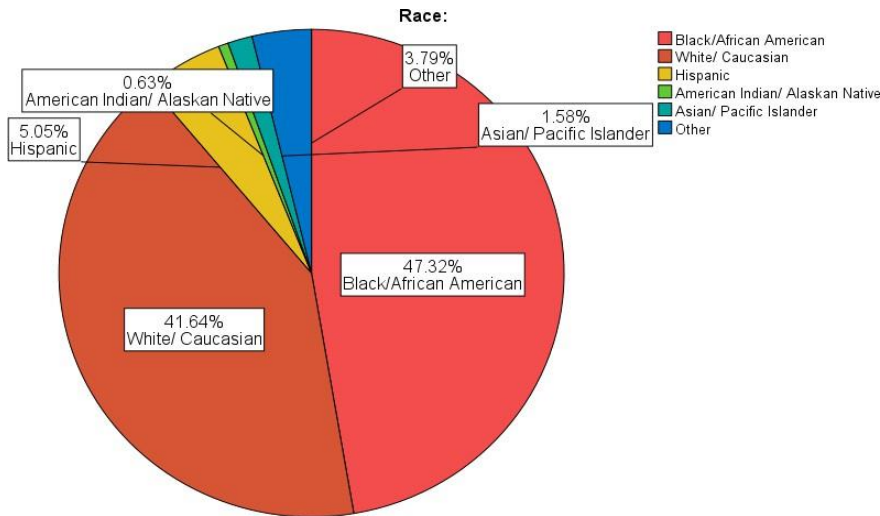
According to the data, almost half (47.32%) of respondents were African American, and slightly less (42.64%) of the respondents were White/Caucasian. The last 11% of respondents were made up of Hispanic (5.05%), American Indian/Alaskan Native (0.63%), Asian/Pacific Islander (1.58%), and the rest making up the Other (3.79%).

Analyzing the data, it shows that performing a test of proportions on the populations of the two largest races (Caucasians and African Americans) tells us that Caucasian population is representative of Georgia's Population. However, the data is not representative of the African American population of Georgia. While the data is not fully representative of the population of Georgia, the team cannot fully discount any conclusions made about the population. The statistical test and source of data are provided on p. 59 of this paper and in the References section.

Gender:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	150	47.2	47.9	47.9
	Female	148	46.5	47.3	95.2
	Non-binary	9	2.8	2.9	98.1
	Prefer not to say	6	1.9	1.9	100.0
	Total	313	98.4	100.0	
Missing	System	5	1.6		
Total		318	100.0		

Gender:
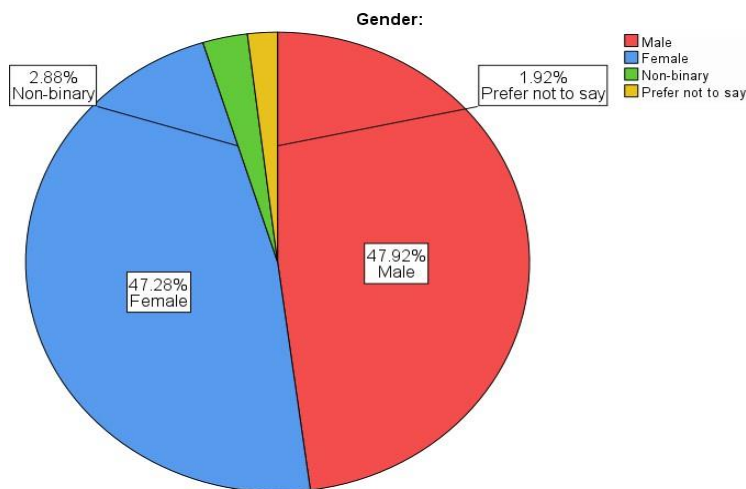
•   According to the data, almost half (47.92%) of respondents were Male and slightly less (47.28%) of the respondents were Female. The last 5% (4.8%) of respondents were made up of Non-Binary (2.88%) and those who preferred not to say (1.92%).

- Analyzing the data, it shows that performing a test of proportions on one of the populations of the largest represented gender (Females) tells us that the female proportion is representative of Georgia's Population.
- The team's gender proportions are consistent with the population of Georgia, showing that this data *is* representative.

The statistical test and source of data are provided on p. 58 of this paper and in the References section.

Preference for Drive-Through rather than Sit-Down: With family

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	74	23.3	23.6	23.6
	Disagree	85	26.7	27.2	50.8
	Neither Agree nor Disagree	71	22.3	22.7	73.5
	Agree	45	14.2	14.4	87.9
	Strongly Agree	38	11.9	12.1	100.0
	Total	313	98.4	100.0	
Missing	System	5	1.6		
Total		318	100.0		

Preference for Drive-Through rather than Sit-Down: With family
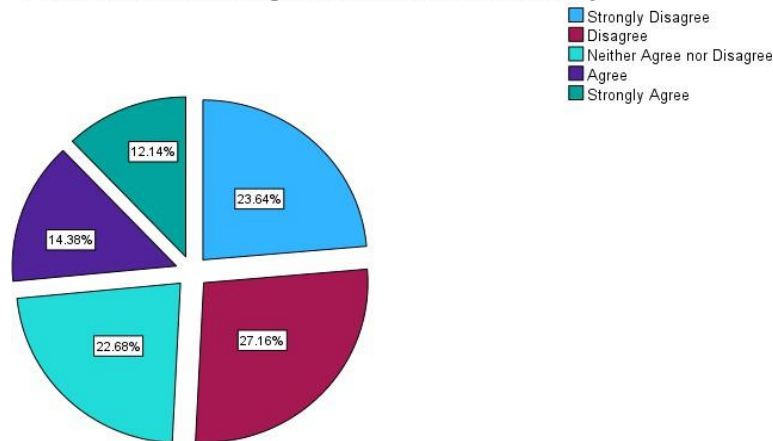
- It is noted that approximately 27% of respondents agreed or strongly agreed that they would rather go through a drive-thru versus sitting down in the restaurant.

- The mean for this variable is 2.64, which is consistent with the low percentage that was mentioned earlier.
- **Managerial Conclusions**: Overall, the respondents enjoy going inside the restaurant to eat with their family instead of going through the drive-through. The numbers show that when with family, the drive-thru is not important for a family meal.

Preference for Drive Through rather than Sit-Down: Eating alone
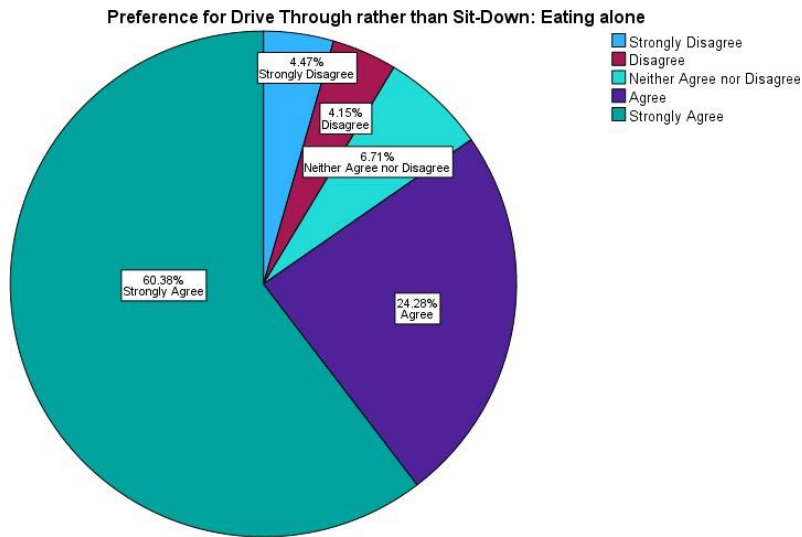
Preference for Drive Through rather than Sit-Down: Eating alone

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	14	3.6	4.5	4.5
	Disagree	13	3.3	4.2	8.6
	Neither Agree nor Disagree	21	5.4	6.7	15.3
	Agree	76	19.4	24.3	39.6
	Strongly Agree	189	48.3	60.4	100.0
	Total	313	80.1	100.0	
Missing	System	78	19.9		
Total		391	100.0		

- The team observed that approximately 85% of respondents prefer to go through the drive-thru when eating alone rather than sitting inside.
- The mean for this variable is 4.32, which is consistent with the large number of respondents and percentage in the previous paragraph.

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- **Managerial Conclusions**: Overall, people seem to prefer to just go through the drive-through when alone. The 60.38% show support that people prefer to use the drive-through instead of eating inside when they are alone.

Preference for Drive-Through rather than Sit-Down: With college friends

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	28	8.8	9.1	9.1
	Disagree	28	8.8	9.1	18.2
	Neither Agree nor Disagree	81	25.5	26.3	44.5
	Agree	87	27.4	28.2	72.7
	Strongly Agree	84	26.4	27.3	100.0
	Total	308	96.9	100.0	
Missing	System	10	3.1		
Total		318	100.0		

Preference for Drive Through rather than Sit Down: With college friends
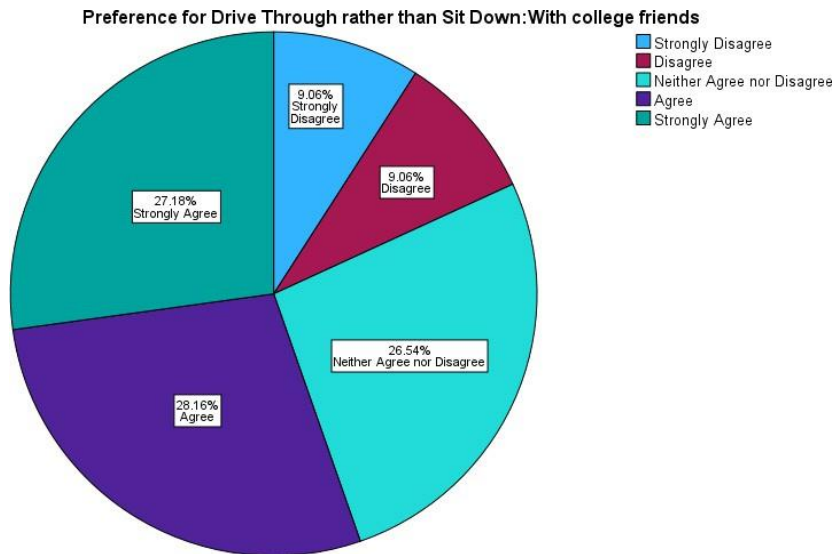
- Approximately 55.4% Agree or Strongly Agree with a preference for drive through with college friends rather than sit down. This shows a strong preference for drive through.
- The mean from this variable is 3.56 on a 5-point scale. This is consistent with the previous findings and also shows a strong preference for drive through.
- **Managerial Conclusion**: Driving through with college friends is doing very well relative to sitting down. In restaurants with a dine-in area, it is recommended to improve the vision and perception of sitting down.

Preference for Drive-Through rather than Sit-Down: On a date
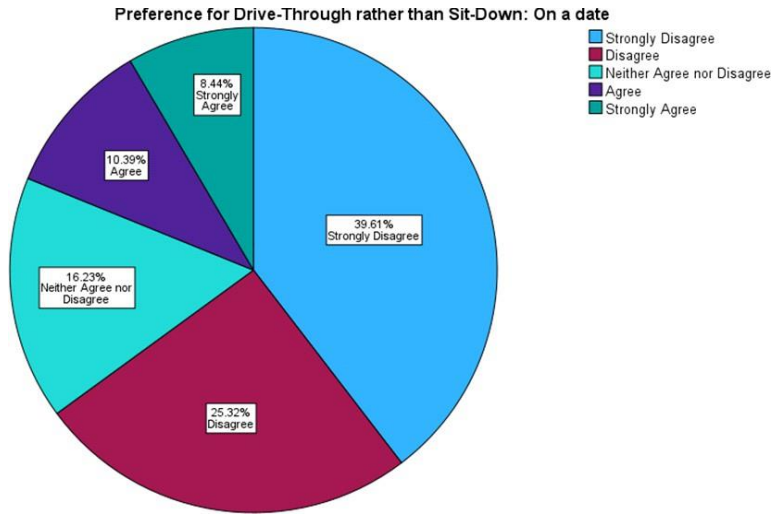
Preference for Drive-Through rather than Sit-Down: On a date

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	122	38.4	39.6	39.6
	Disagree	78	24.5	25.3	64.9
	Neither Agree nor Disagree	50	15.7	16.2	81.2
	Agree	32	10.1	10.4	91.6
	Strongly Agree	26	8.2	8.4	100.0
	Total	308	96.9	100.0	
Missing	System	10	3.1		
Total		318	100.0		

• Approximately 18.3% Agree or Strongly Agree with a preference for drive through on a date rather than sit down. This shows a low preference for drive through.
• The mean from this variable is 2.23 on a 5-point scale. This is consistent with the previous finding also showing a low preference for drive through on a date.
• **Managerial Conclusion**: Driving through for a date is doing low relative to sitting down. It is recommended that there should be emphasis and attention placed on the atmosphere in the dine-in area.

Have you ever eaten at Chick-fil-A:
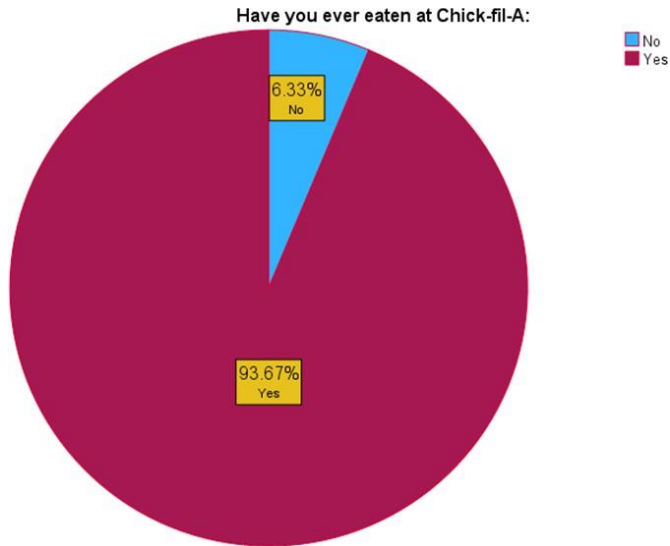
Have you ever eaten at Chick-fil-A:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	19	6.0	6.0	6.0
	Yes	296	93.1	94.0	100.0
	Total	315	99.1	100.0	
Missing	System	3	.9		
Total		318	100.0		

•   Approximately (93.67%) 94% of people have eaten at the restaurant Chick-fil-A. The majority of respondents have eaten at Chick-fil-A.

•   The Mean for the variable (Have you ever eaten at Chick-fil-A) is 4 on a 5-point scale. This is consistent with the high percentage of respondents who said that they have eaten at Chick- fil-A.

•   **Managerial Conclusion**: Most people who eat at fast food restaurants have eaten at Chick-fil-A.

Have you ever eaten at Popeyes:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	54	17.0	17.1	17.1
	Yes	261	82.1	82.9	100.0
	Total	315	99.1	100.0	
Missing	System	3	.9		
Total		318	100.0		

Have you ever eaten at Popeyes:
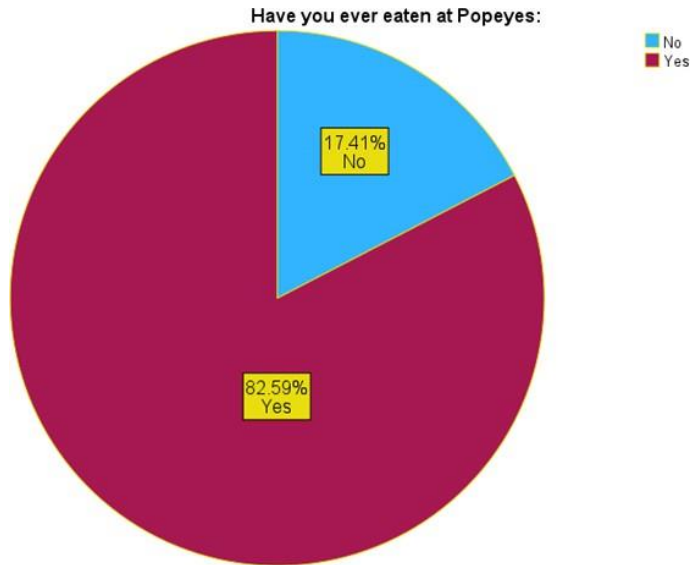
• Approximately (82.59%) 83% of people have eaten at the restaurant Popeyes. The majority of respondents have eaten at Popeyes.
• The mean for the variable is approximately 4, which is consistent with the respondents and the previous percentages.
• **Managerial Conclusion**: Most of the respondents have eaten at the restaurant Popeyes.

On average, how many times a week do you vist Chick-fil-A?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	50	15.7	16.0	16.0
	1.00	131	41.2	41.9	57.8
	2.00	61	19.2	19.5	77.3
	3.00	32	10.1	10.2	87.5
	4.00	23	7.2	7.3	94.9
	5.00	9	2.8	2.9	97.8
	6.00	3	.9	1.0	98.7
	7.00	4	1.3	1.3	100.0
	Total	313	98.4	100.0	
Missing	System	5	1.6		
Total		318	100.0		

On average, how many times a week do you vist Chick-fil-A?

- 1.28% 7.00
- 2.88% 5.00
- 0.96% 6.00
- 1.28% 7.00
- 7.35% 4.00
- 15.97% .00
- 10.22% 3.00
- 19.49% 2.00
- 41.85% 1.00

Legend:
- .00
- 1.00
- 2.00
- 3.00
- 4.00
- 5.00
- 6.00
- 7.00
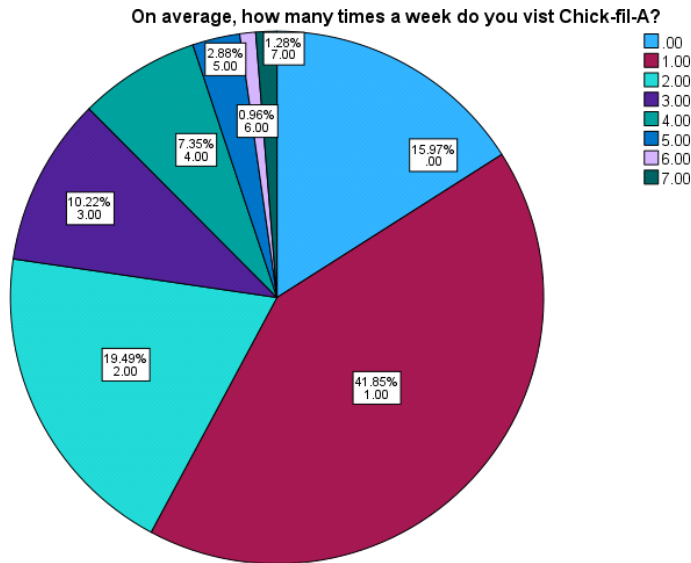
•   The data shows that 61.34% of respondents go to Chick-fil-A between once and twice a week.

•   These responses were based on an open-ended question, and the mean for this question was 1.69. This aligns with previous data findings.

•   **Managerial Conclusion**: It is a positive finding that over half the respondents go to Chick-fil-A 1 or more times a week. Managers should work to target the 15.97% that typically do not visit the restaurant at all during the week.

On Average, Approximately How Much Do You Spend Each Time You Visit Chick-fil-A?

•   Roughly 42% (42.26%) of respondents spend $10-$15 on average per visit to Chick-fil-A. This result was derived from an open-ended question in this survey. Only about 8.6% of Chick-fil-A customers spend $20 per visit. The minimum value for this question was $0, and the maximum value was $55.

•   The mean was $13.87, which aligns with prior results.

•   **Managerial Conclusion**: The average price for a meal at Chick-fil-A lies around the $14 mark. Few respondents spend $20 or more at the restaurant per visit.

Chick-fil-A - I am a regular at Chick-fil-A:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	30	9.4	9.9	9.9
	Disagree	59	18.6	19.5	29.5
	Neither Agree nor Disagree	62	19.5	20.5	50.0
	Agree	89	28.0	29.5	79.5
	Strongly Agree	62	19.5	20.5	100.0
	Total	302	95.0	100.0	
Missing	System	16	5.0		
Total		318	100.0		

Chick-fil-A - I am a regular at Chick-fil-A:

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

9.97% Strongly Disagree
19.27% Disagree
20.60% Neither Agree nor Disagree
29.57% Agree
20.60% Strongly Agree
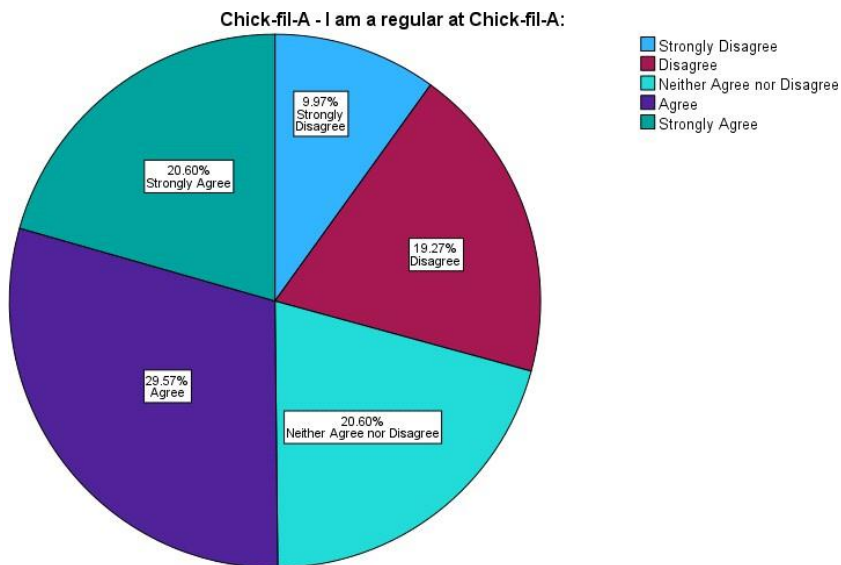
• Approximately 50 percent (50.17%) of the respondents claim to be regulars of Chick-fil-A. 20.6% of the respondents neither agree nor disagree with this statement.

• The mean for this question was 3.31 on a 5-point scale. This finding is consistent with prior results. With a rating of 3.31, it falls towards the middle of this 5-point scale, much like 50% is the middle point for the data results.

• **Managerial Conclusion**: The team was able to see that approximately half of the respondents claim to be regulars at Chick-fil-A. Chick-fil-A has a solid foundation of regular customers, but they should work to target the approximately 29% that either disagree or strongly disagree with this statement.
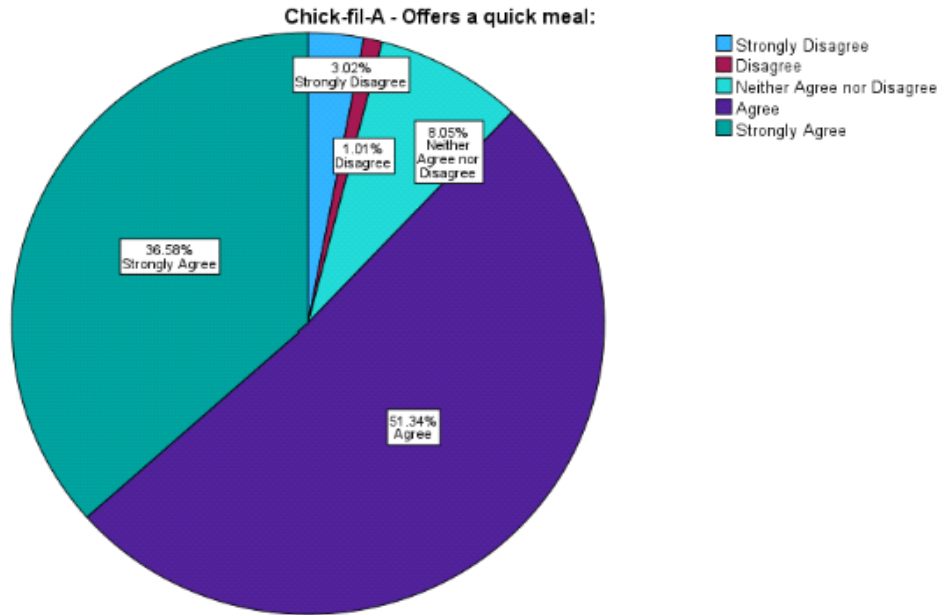
Chick-fil-A - Offers a quick meal:

Chick-fil-A - Offers a quick meal:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	2.3	3.0	3.0
	Disagree	3	.8	1.0	4.0
	Neither Agree nor Disagree	24	6.2	8.1	12.1
	Agree	153	39.3	51.3	63.4
	Strongly Agree	109	28.0	36.6	100.0
	Total	298	76.6	100.0	
Missing	System	91	23.4		
Total		389	100.0		

• Approximately 88 percent (87.92%) agree with the statement that Chick-fil-A offers a quick meal. Only about 4% of consumers disagree or strongly disagree with this statement.

• The mean on this 5-point Likert scale was 4.17. This shows a strong positive correlation that customer satisfaction is high in terms of speed of receiving their meal.

• **Managerial Conclusion**: Chick-fil-A is doing a fantastic job at providing a quick meal for their customers. They should continue with these practices, as their customers seem to be highly satisfied in this category.

Chick-fil-A - Offers an inexpensive meal:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	11	3.5	3.7	3.7
	Disagree	65	20.4	21.8	25.5
	Neither Agree nor Disagree	99	31.1	33.2	58.7
	Agree	93	29.2	31.2	89.9
	Strongly Agree	30	9.4	10.1	100.0
	Total	298	93.7	100.0	
Missing	System	20	6.3		
Total		318	100.0		

Chick-fil-A - Offers an inexpensive meal:

Legend:
- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

3.69% Strongly Disagree
10.07% Strongly Agree
31.21% Agree
33.22% Neither Agree nor Disagree
21.81% Disagree
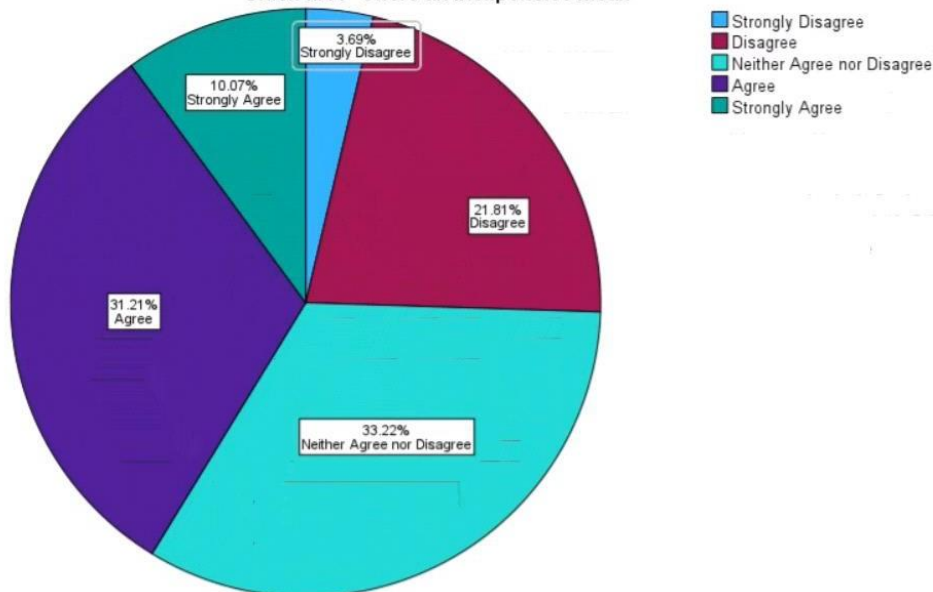
• 41.28% of respondents believe that Chick-fil-A offers an inexpensive meal. 33.22% neither agree nor disagree with this statement.

• Based on a 5-point Likert scale, the mean was 3.22. This reflects the above statement, and does not show a strong positive agreement to the statement "Chick-fil-A offers an inexpensive meal."

• **Managerial Conclusion**: Based on the results, respondents do not overwhelmingly agree that Chick-fil-A offers an inexpensive meal. Many of the respondents seem to fall somewhere in the middle, being neither agree nor disagree. Chick-fil-A should look at their meal pricing, and possibly make changes to prices in order to make them more enticing to all customers.

Chick-fil-A - Offers a pleasant dining experience:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	2.2	2.3	2.3
	Disagree	6	1.9	2.0	4.3
	Neither Agree nor Disagree	50	15.7	16.7	21.0
	Agree	139	43.7	46.3	67.3
	Strongly Agree	98	30.8	32.7	100.0
	Total	300	94.3	100.0	
Missing	System	18	5.7		
Total		318	100.0		

Chick-fil-A - Offers a pleasant dining experience:

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

2.33% Strongly Disagree
2.00% Disagree
16.67% Neither Agree nor Disagree
32.67% Strongly Agree
46.33% Agree
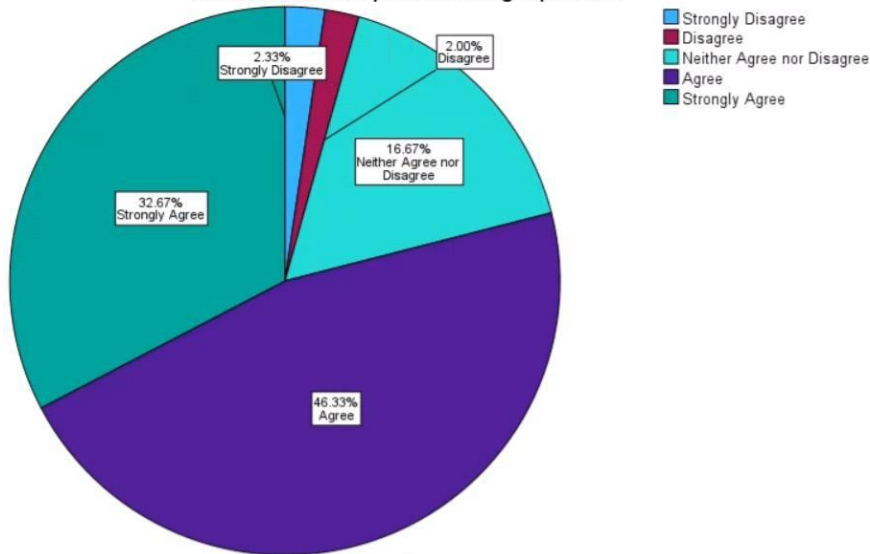
• The chart shows that 79% of respondents either agree or strongly agree that Chick-fil-A offers a pleasant dining experience. Only 4.33% of respondents disagree or strongly disagree with this statement. 16.67% do not have a strong opinion.

• Based on this 5-point Likert scale, the mean was 4.05. This shows a strong and positive attitude towards the pleasantness of the restaurant.

• **Managerial Conclusion**: Based on the results, the team can conclude that a majority of customers believe that Chick-fil-A offers a pleasant atmosphere and dining experience. Chick-fil-A should continue with their current practices, as customers seem to be quite receptive towards how the restaurant operates.

Chick-fil-A - Menu offers a good variety of options:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	3.1	3.3	3.3
	Disagree	27	8.5	9.0	12.3
	Neither Agree nor Disagree	65	20.4	21.6	33.9
	Agree	133	41.8	44.2	78.1
	Strongly Agree	66	20.8	21.9	100.0
	Total	301	94.7	100.0	
Missing	System	17	5.3		
Total		318	100.0		

Chick-fil-A - Menu offers a good variety of options:
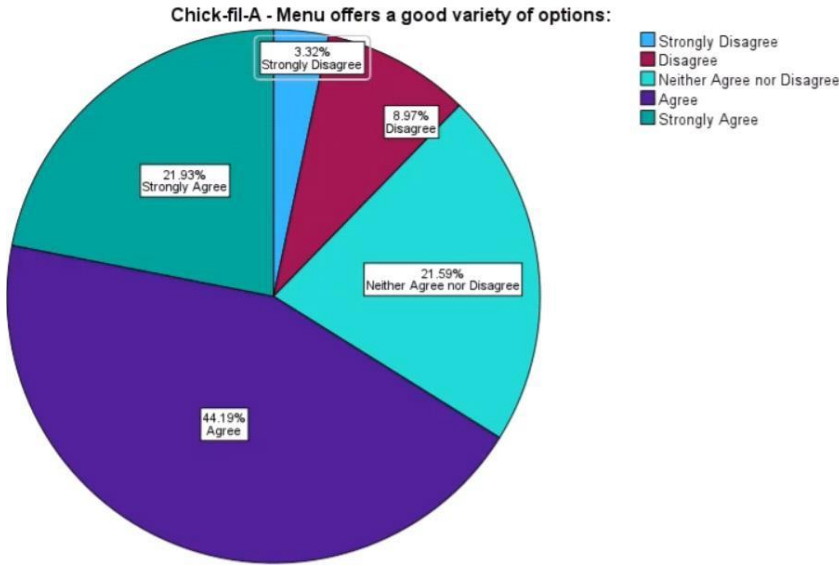
- 66.12% of respondents believe that the Chick-fil-A menu offers a good variety of options. 12.29% either disagree or strongly disagree with this statement. 21.59% fall somewhere in between.
- The mean for this question is 3.77, and was based on a 5-point Likert scale. The team can see that these findings are consistent with each other. 3 is the midpoint for this Likert scale, and 50% is the midpoint for this data. In both sets of data, the scores were well above the midpoints.
- **Managerial Conclusion**: It seems that many customers believe that Chick-fil-A offers a good variety of options. By adding more options and increasing menu size, Chick-fil-A could target the 12.29% of people who are dissatisfied with the number of menu options.

Chick-fil-A - Offers quick service in the drive-thru line:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	2.8	3.0	3.0
	Disagree	5	1.6	1.7	4.7
	Neither Agree nor Disagree	32	10.1	10.7	15.4
	Agree	121	38.1	40.6	56.0
	Strongly Agree	131	41.2	44.0	100.0
	Total	298	93.7	100.0	
Missing	System	20	6.3		
Total		318	100.0		

Chick-fil-A - Offers quick service in the drive-thru line:
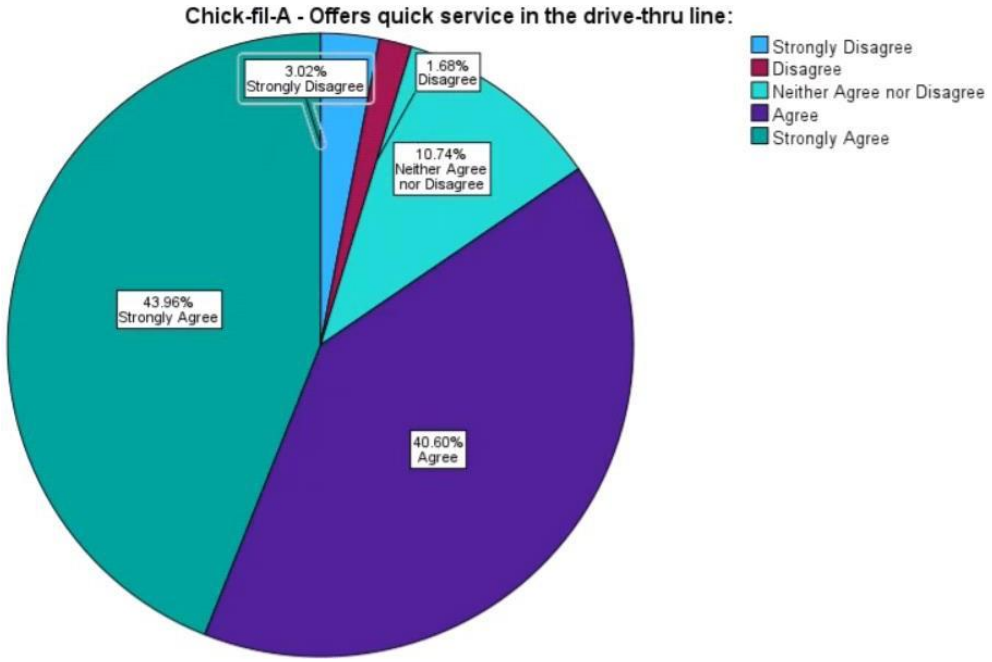
- Approximately 85% (84.56%) of respondents agree or strongly agree that Chick-fil-A offers quick service in the drive-thru line. Only 4.72 percent of respondents disagree or strongly disagree with this statement.
- The mean for the question was 4.21 out of 5. 1 represented strongly disagree and 5 represented strongly agree. This finding shows that most respondents have a strong positive outlook on the speediness of the Chick-fil-A drive-thru.
- **Managerial Conclusion**: Chick-fil-A should continue to run their drive-thru in this manner, as a large portion of respondents think they offer speedy drive-thru service.

Chick-fil-A - Offers healthy options:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	12	3.1	4.0	4.0
	Disagree	21	5.4	7.0	10.9
	Neither Agree nor Disagree	58	14.8	19.2	30.1
	Agree	136	34.8	45.0	75.2
	Strongly Agree	75	19.2	24.8	100.0
	Total	302	77.2	100.0	
Missing	System	89	22.8		
Total		391	100.0		

Chick-fil-A - Offers healthy options:
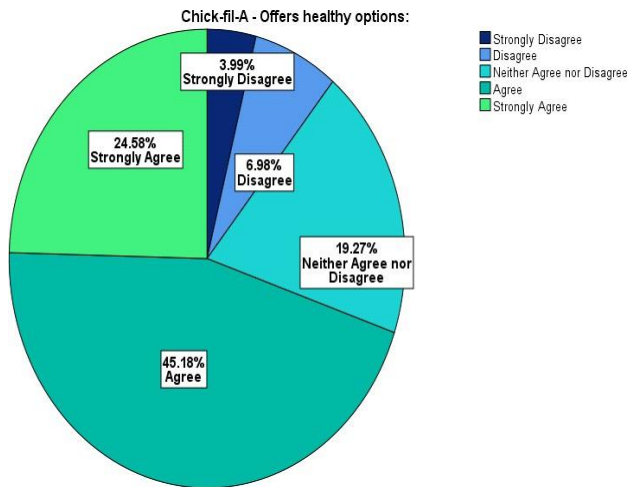
- The data presented shows that approximately 25% of the survey participants strongly agree, and 45% of participants agree that Chick-fil-A offers healthy options. Combined, 70% of participants concur that Chick-fil-A has healthy food options.
- The mean for this variable on a 5-point scale was 3.79. Based on the mean, participants seem to be content with Chick-fil-A's menu.
- **Managerial Conclusion**: Chick-fil-A is a fast-food eating establishment that prides itself on delicious and fast food; however, the brand may benefit from offering more health-conscious food choices to raise this mean.

Chick-fil-A - Is in an easily accessible location:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	2.5	2.7	2.7
	Disagree	10	3.1	3.3	6.0
	Neither Agree nor Disagree	33	10.4	11.0	17.0
	Agree	147	46.2	49.0	66.0
	Strongly Agree	102	32.1	34.0	100.0
	Total	300	94.3	100.0	
Missing	System	18	5.7		
Total		318	100.0		

Chick-fil-A - Is in an easily accessible location:
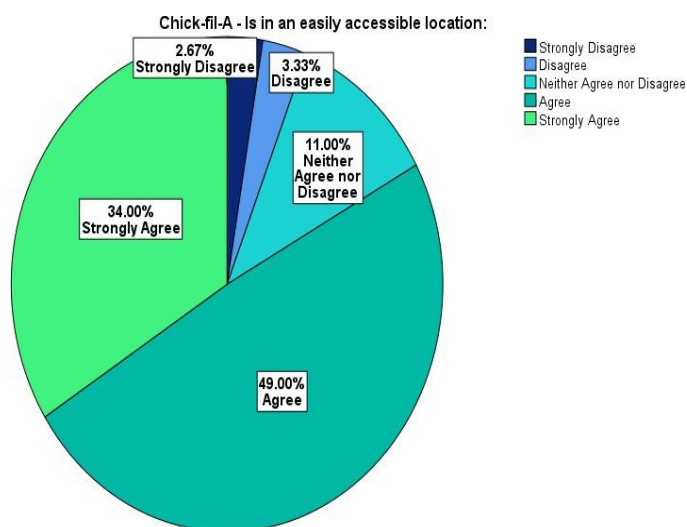
- The data from the survey shows that 34% of participants strongly agree, and 49% agree that Chick-fil-A is in an easily accessible area. Combined, 83% of participants share this sentiment.
- On a 5-point scale, the mean for those satisfied with Chick-fil-A's location is 4.08. Chick-fil-A's location can be connected to the number of people who favor using the drive-through (4.32) versus sitting in a restaurant to eat.
- **Managerial Conclusion**: Both of these means signify that people are satisfied with Chick-fil-A's location and means of serving food. As it favors an audience of people who enjoy receiving their food via drive-throughs, managers of Chick-fil-A should be incredibly proud of where they have built their business.

Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	2.5	2.7	2.7
	Disagree	3	.9	1.0	3.7
	Neither Agree nor Disagree	38	11.9	12.7	16.3
	Agree	139	43.7	46.3	62.7
	Strongly Agree	112	35.2	37.3	100.0
	Total	300	94.3	100.0	
Missing	System	18	5.7		
Total		318	100.0		

Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:
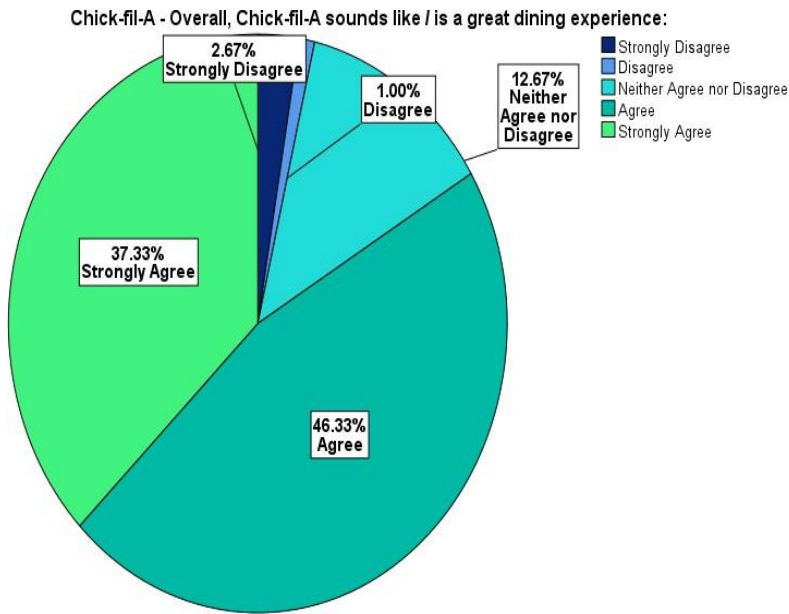
- The data from the survey shows that approximately 84 percent of participants agree or strongly agree that, overall, Chick-fil-A is a great dining experience.
- On a 5-point scale, 1 represents a stance of strong disagreement, and 5 illustrates a view of strong agreement. The mean is 4.15 for the participants who feel that Chick-fil-A is a great dining experience.

• **Managerial Conclusion:** Based on the data presented, a high percentage of the respondents believe that Chick-fil-A offers a great dining experience. Only 3.67% disagreed or strongly disagreed with this sentiment. Chick-fil-A should continue with their current restaurant practices, as customers seem to be receptive to this.

Popeyes - I am a regular at Popeyes:
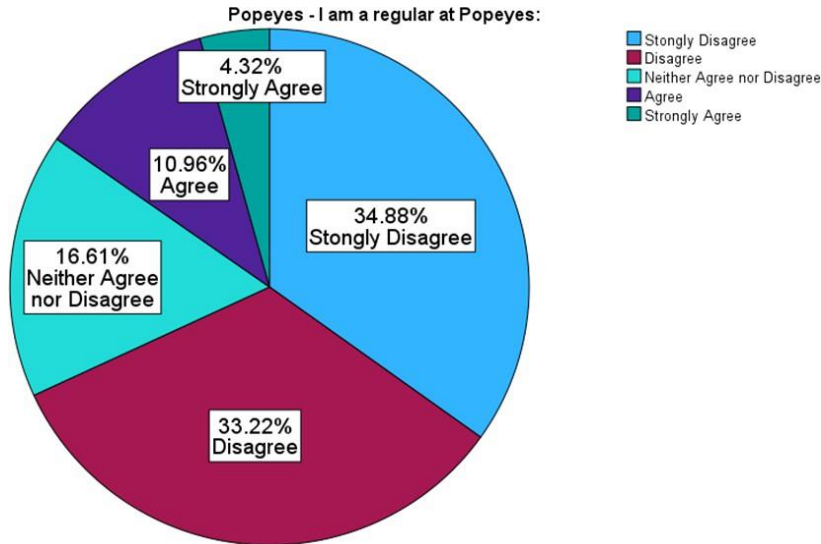
Popeyes - I am a regular at Popeyes:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Stongly Disagree	105	33.0	34.9	34.9
	Disagree	100	31.4	33.2	68.1
	Neither Agree nor Disagree	50	15.7	16.6	84.7
	Agree	33	10.4	11.0	95.7
	Strongly Agree	13	4.1	4.3	100.0
	Total	301	94.7	100.0	
Missing	System	17	5.3		
Total		318	100.0		

• The data shows that most of the responses had a response showing that they are not regulars at Popeyes. Out of those who submitted an answer 68.1% responded with Disagree or Strongly Disagree.

• Additionally, the average response on a 5-point scale, 1 being strongly disagree and 5 being strongly agree, was 2.17. This shows that the sample does not eat at Popeyes often. The low mean is consistent with the high percentage of respondents who selected Disagree or Strongly Disagree.

• **Managerial Conclusion**: The team recommends that Popeyes comes out with new items and work on making their food taste more consistent. When Popeyes released a new chicken sandwich every store had cars lined outside of their parking lot for weeks. The customers slowly dwindled down to what it is now. The team believes that bringing new items to the menu and working on their food consistently will create more regulars at Popeyes.

Popeyes - Offers a quick meal:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Stongly Disagree	19	6.0	6.3	6.3
	Disagree	37	11.6	12.3	18.7
	Neither Agree nor Disagree	94	29.6	31.3	50.0
	Agree	126	39.6	42.0	92.0
	Strongly Agree	24	7.5	8.0	100.0
	Total	300	94.3	100.0	
Missing	System	18	5.7		
Total		318	100.0		

Popeyes - Offers a quick meal:

- Stongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

- 6.33% Stongly Disagree
- 8.00% Strongly Agree
- 12.33% Disagree
- 42.00% Agree
- 31.33% Neither Agree nor Disagree
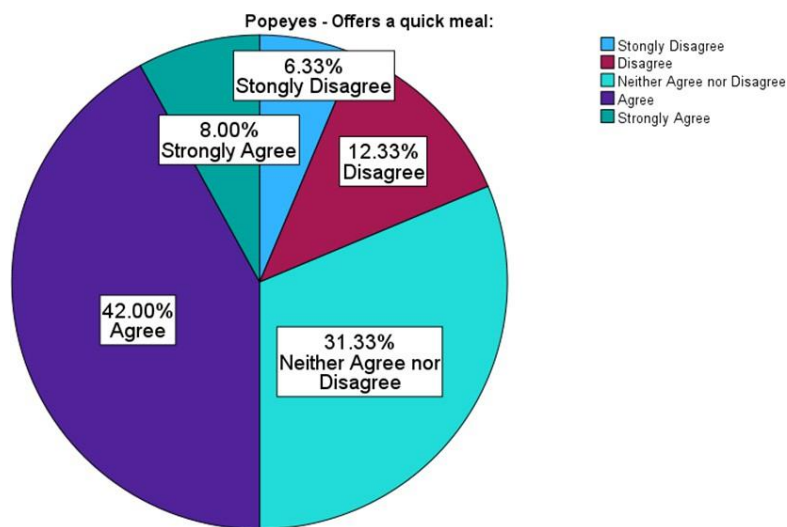
• The data shows that half of the respondents believe Popeyes offers a quick meal. 50% of the sample selected Agree or Strongly Agree.

• Furthermore, the average response on a 5-point scale, 1 being Strongly Disagree and 5 being strongly Agree, was 3.33. The mean shows that half of the respondents agree with the sentiment "Popeyes offers a quick meal." The other half either disagrees or strongly disagrees with this sentiment, or simply does not feel strongly either way.

• **Managerial Conclusion**: The team recommends working on the process and system of making orders. Among the respondents, 31.33% neither agree nor disagree with the speediness of the meal. By improving the time it takes to prepare and serve an order, there may be an influx in both customer satisfaction and sales.

Popeyes - Offers an inexpensive meal:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Stongly Disagree	13	4.1	4.3	4.3
	Disagree	38	11.9	12.7	17.1
	Neither Agree nor Disagree	109	34.3	36.5	53.5
	Agree	113	35.5	37.8	91.3
	Strongly Agree	26	8.2	8.7	100.0
	Total	299	94.0	100.0	
Missing	System	19	6.0		
Total		318	100.0		

Popeyes - Offers an inexpensive meal:

- Stongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree
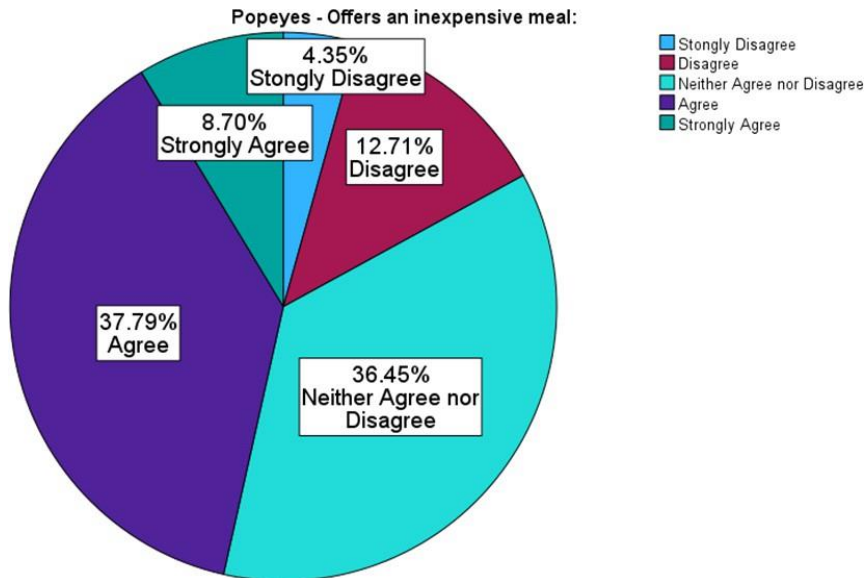
•   Based on the data collected, 46.49 percent of customers either agree or strongly agree that Popeyes offers an inexpensive meal.

•   Additionally, the average response on a 5-point scale, 1 being Strongly Disagree and 5 being Strongly Agree, was 3.34. The mean shows that the majority of the people are not impressed by Popeyes pricing.

•   **Managerial Conclusion**: The team recommends Popeyes work on trying to lower their pricing to help attract more customers. Price plays a major role in consumer decision-making. The team thinks looking for new vendors and finding more cost friendly items will help solve this problem.

Popeyes - Offers a pleasant dining experience:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Stongly Disagree	17	5.3	5.7	5.7
	Disagree	59	18.6	19.7	25.4
	Neither Agree nor Disagree	143	45.0	47.8	73.2
	Agree	67	21.1	22.4	95.7
	Strongly Agree	13	4.1	4.3	100.0
	Total	299	94.0	100.0	
Missing	System	19	6.0		
Total		318	100.0		

Popeyes - Offers a pleasant dining experience:

- Stongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

4.35% 5.69% 22.41% 19.73% 47.83%
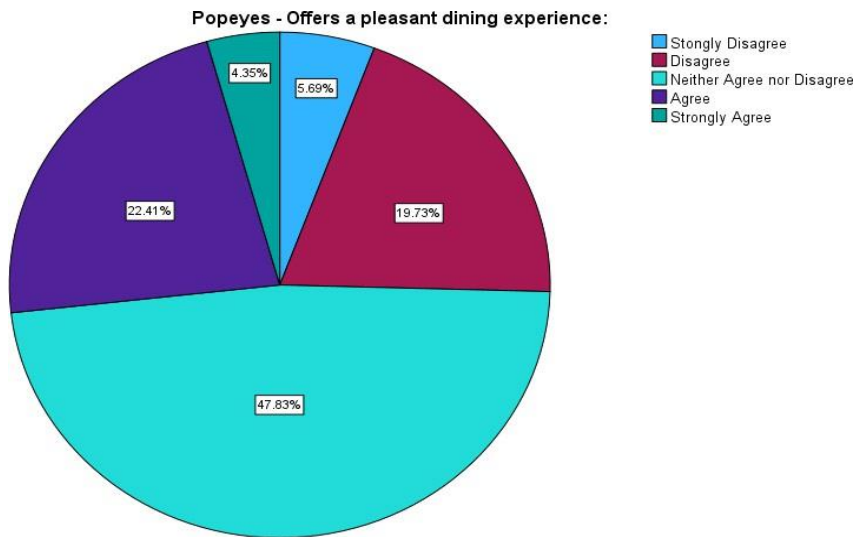
• The data shows that 26.76% of respondents agree or strongly agree that Popeyes offers a pleasant dining experience. 47.83% of the respondents chose "Neither Agree nor Disagree." Because almost half of the respondents chose this option, the team can see that many respondents do not have a strong opinion on the pleasantness of the dining experience at Popeyes.

• This data was based on a 5-point scale, with Strongly Agree being 1 and Strongly Disagree being 5. Popeyes' average score for this question was a 3.0. This tells us that this sample of 299 respondents neither agree nor disagree that Popeyes offers a pleasant dining experience, and the test results reflect this.

• **Managerial Conclusion**: Popeyes customers do not seem to strongly agree nor strongly disagree with the idea that Popeyes offers a pleasant dining experience. They fall mostly in the middle. The team recommends taking actions that will make customers feel more welcomed and comfortable at the establishment.

Popeyes - Menu offers a good variety of options:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	18	5.7	6.0	6.0
	Disagree	56	17.6	18.7	24.7
	Neither Agree nor Disagree	110	34.6	36.7	61.3
	Agree	95	29.9	31.7	93.0
	Strongly Agree	21	6.6	7.0	100.0
	Total	300	94.3	100.0	
Missing	System	18	5.7		
Total		318	100.0		

Popeyes - Menu offers a good variety of options:
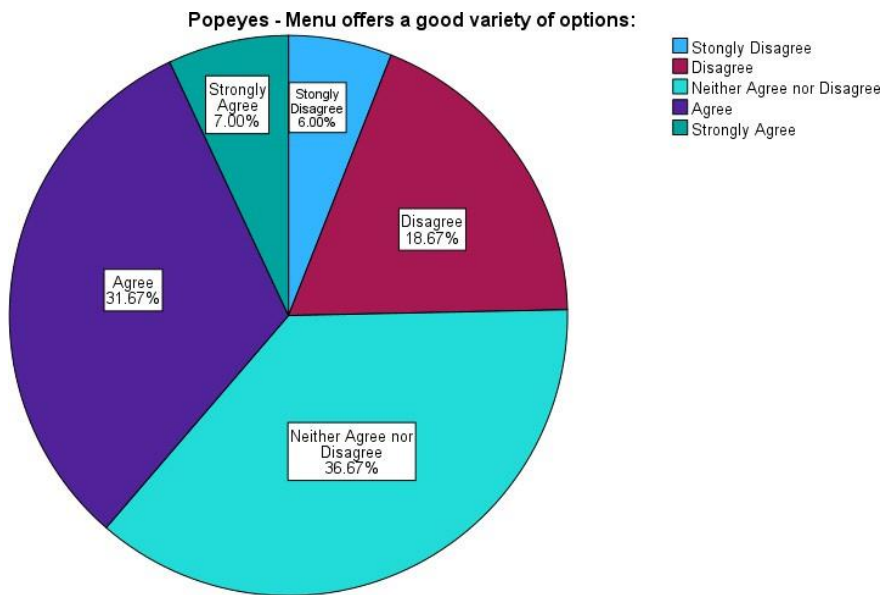
- 38.6% of respondents believe that Popeyes offers a good variety of menu options. 36.67% of respondents chose "Neither Agree nor Disagree" for this question, and 24.67% chose either "Disagree" or "Strongly Disagree."
- On a 5-point Likert scale, the mean was 3.15. This was consistent with prior data findings, as it does not seem that respondents believe that Popeyes offers a good variety of options. They seem to fall somewhere in the middle for this statement.

• **Managerial Conclusion**: Because many respondents do not seem to believe that Popeyes has a large variety of menu options, Popeyes could benefit by increasing their menu size and food variety.

Popeyes - Offers quick service in the drive-thru line:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	23	7.2	7.7	7.7
	Disagree	58	18.2	19.4	27.1
	Neither Agree nor Disagree	111	34.9	37.1	64.2
	Agree	76	23.9	25.4	89.6
	Strongly Agree	31	9.7	10.4	100.0
	Total	299	94.0	100.0	
Missing	System	19	6.0		
Total		318	100.0		

Popeyes - Offers quick service in the drive-thru line:
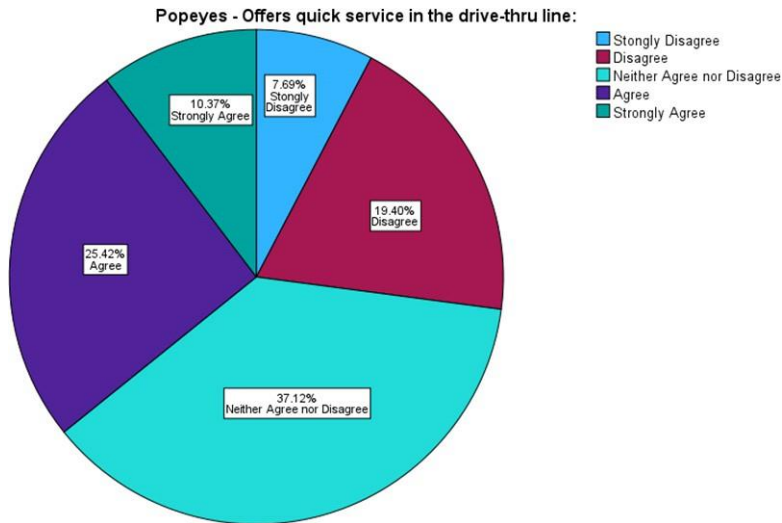
• 35.79% of respondents feel that Popeyes offers quick service in the drive-thru line. 37.12% neither agree nor disagree with this statement. 27.09% disagree with this statement completely.

- The mean for this question is 3.11 out of a 5-point scale. 1 represents "Strongly Disagree" and 5 represents "Strongly Agree." This aligns with the findings from the data, as most of the data lies in the middle.
- **Managerial Conclusion**: Based on the data, many respondents seem to neither agree nor disagree with the above statement. In order to increase customer satisfaction, Popeyes should be aware of how long it takes to get a meal out through the drive-thru line, and take the necessary steps to increase their speediness.

Popeyes - Offers healthy options:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Stongly Disagree	68	21.4	22.7	22.7
	Disagree	108	34.0	36.0	58.7
	Neither Agree nor Disagree	102	32.1	34.0	92.7
	Agree	16	5.0	5.3	98.0
	Strongly Agree	6	1.9	2.0	100.0
	Total	300	94.3	100.0	
Missing	System	18	5.7		
Total		318	100.0		

Popeyes - Offers healthy options:

105
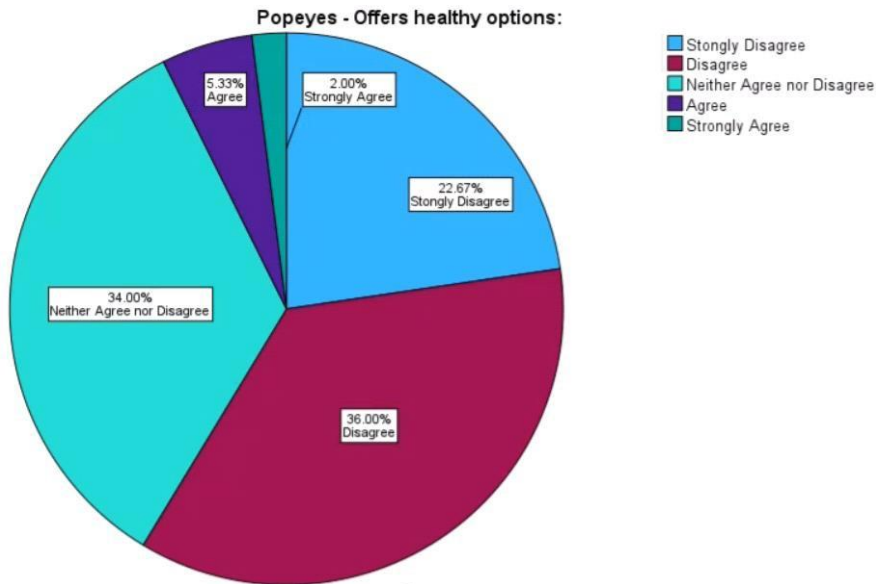
- Only 7.33% of respondents believe that Popeyes offers healthy options. 58.67% either disagreed or strongly disagreed with this statement. 34% of respondents fell somewhere in the middle.
- Based on this 5-point Likert scale, with 1 being strongly disagree and 5 being strongly agree, the mean was 2.28. This is consistent with prior data findings, as many respondents seem to disagree with the idea that Popeyes offers healthy options.
- **Managerial Conclusion**: By adding healthier menu options, Popeyes could improve their customer perceptions about the health options on the menu. Many people seem to believe that the menu has a majority of unhealthy options.

Popeyes - Is in an easily accessible location:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Stongly Disagree	16	5.0	5.4	5.4
	Disagree	28	8.8	9.4	14.7
	Neither Agree nor Disagree	94	29.6	31.4	46.2
	Agree	121	38.1	40.5	86.6
	Strongly Agree	40	12.6	13.4	100.0
	Total	299	94.0	100.0	
Missing	System	19	6.0		
Total		318	100.0		

Popeyes - Is in an easily accessible location:

- Stongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

5.35% Stongly Disagree
9.36% Disagree
13.38% Strongly Agree
31.44% Neither Agree nor Disagree
40.47% Agree
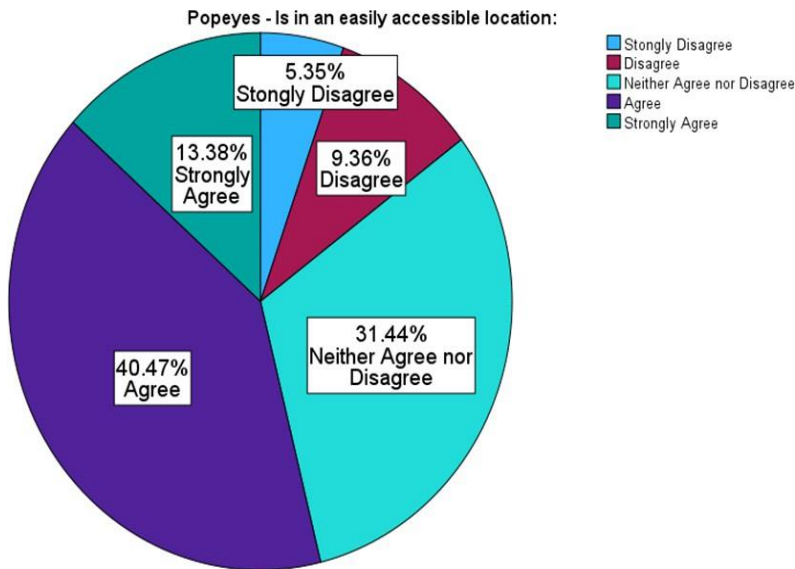
• 53.85% either agree or strongly agree that Popeyes locations are easily accessible. 31.44% neither agree nor disagree. 14.71% either disagree or strongly disagree with this sentiment.

• Furthermore, the average answer on a 5-point scale was 3.47. The average shows Popeyes location accessibility is mediocre.

• **Managerial Conclusion**: The team thinks Popeyes should not worry about their location. Not many people decide on eating at Popeyes because of their location. The team recommends focusing more on pricing and a quick meal which will help create more regular customers.

Popeyes - Overall, Popeyes sounds like / is a great dining experience:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Stongly Disagree	21	6.6	7.0	7.0
	Disagree	38	11.9	12.6	19.6
	Neither Agree nor Disagree	139	43.7	46.2	65.8
	Agree	80	25.2	26.6	92.4
	Strongly Agree	23	7.2	7.6	100.0
	Total	301	94.7	100.0	
Missing	System	17	5.3		
Total		318	100.0		

Popeyes - Overall, Popeyes sounds like / is a great dining experience:
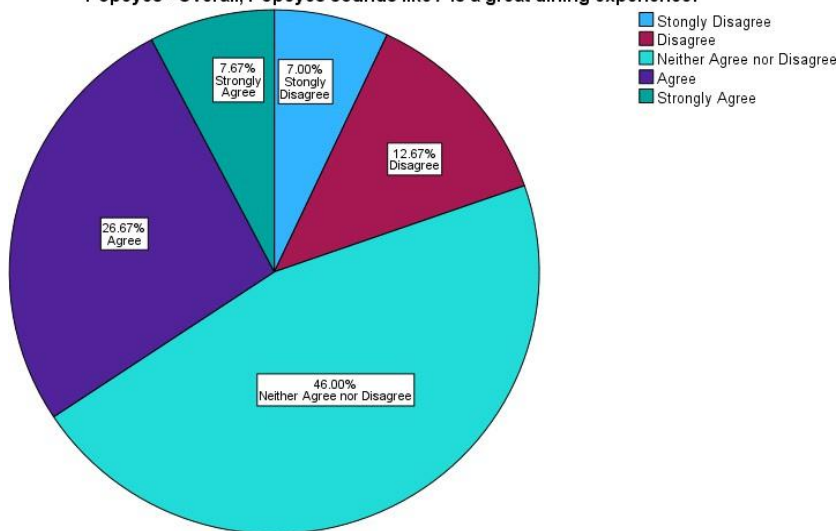
- The data shows that 39.27% Strongly Agree or Agree that popeyes sounds like/is a great dining experience.
- This data is based on a 5 point scale, with 5 being strongly and 1 being Strongly Disagree. The average score for this question was 3.15, which means out of the 300 respondents that were asked, majority neither agree or disagree that Popeyes sounds like/is a great dining experience; the data from the chart is consistent.
- **Managerial Conclusion:** Overall, Popeyes customer satisfaction seems low. Most respondents seem to fall in the "Neither Agree nor Disagree" category. The team recommends that Popeyes focuses on creating a better dining experience for their customers so they can flip the respondents that are in the middle ground.

I Prefer: - 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Prefer Chick-fil-A	124	39.0	45.9	45.9
	Prefer Chick-fil-A	67	21.1	24.8	70.7
	Neutral	40	12.6	14.8	85.6
	Prefer Popeyes	16	5.0	5.9	91.5
	Strongly Prefer Popeyes	23	7.2	8.5	100.0
	Total	270	84.9	100.0	
Missing	System	48	15.1		
Total		318	100.0		

I Prefer: - 1

108
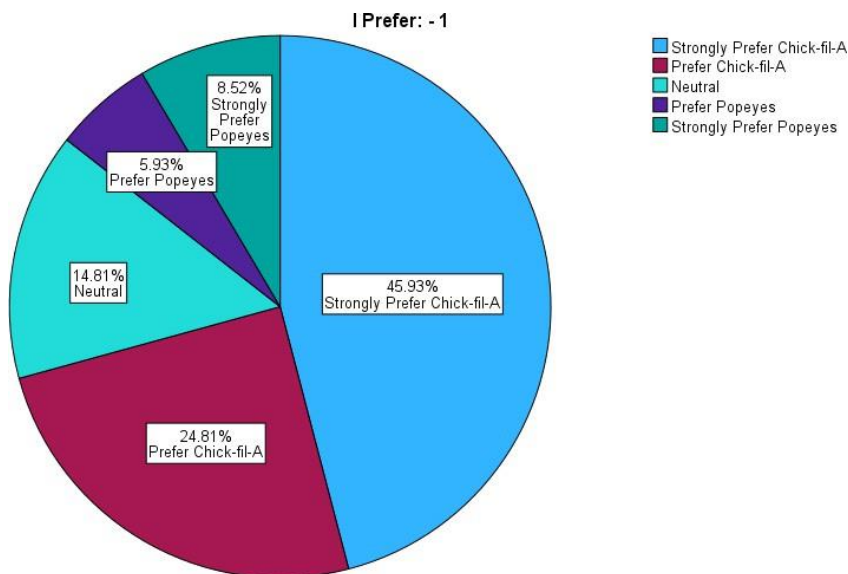
- The data shows that approximately 70.7% of respondents prefer Chick-fil-A over Popeyes. This is a staggering result and a great look for Chick-fil-A
- On the scale for this statement, with 1 being strongly prefer Chick-fil-A and 5 being strongly prefer Popeyes, the average response was 2.06. This means that, on average, people prefer Chick-fil-A over Popeyes. For this particular question, "Strongly prefer Chick-fil-A" is represented by 1. The more people who prefer Chick-fil-A, the more that the results would skew closer to 1 and 2; in this case, it is almost at 2. This is a great indicator for Chick-fil-A.
- **Managerial Conclusion**: The team recommends that Chick-fil-A continue with their current business practices, but also consider the recommendations that the team has made thus far, as Chick-fil-A seems to have retained a satisfied and consistent consumer base. Almost 3/4ths of the respondents prefer Chick-fil-A over Popeyes. Chick-fil-A management should feel proud of this sentiment, but should also be aware of the possible recommendations that the team has made based on the survey data.

Q10 - I think Chick-fil-A should add a value option on the menu.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	15	4.7	5.0	5.0
	Disagree	11	3.5	3.7	8.7
	Neither Agree nor Disagree	59	18.6	19.7	28.4
	Agree	91	28.6	30.4	58.9
	Strongly Agree	123	38.7	41.1	100.0
	Total	299	94.0	100.0	
Missing	System	19	6.0		
Total		318	100.0		

Q10 - I think Chick-fil-A should add a value option on the menu.

5.02%
Strongly Disagree

3.68%
Disagree

19.73%
Neither Agree nor Disagree

41.14%
Strongly Agree

30.43%
Agree

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree
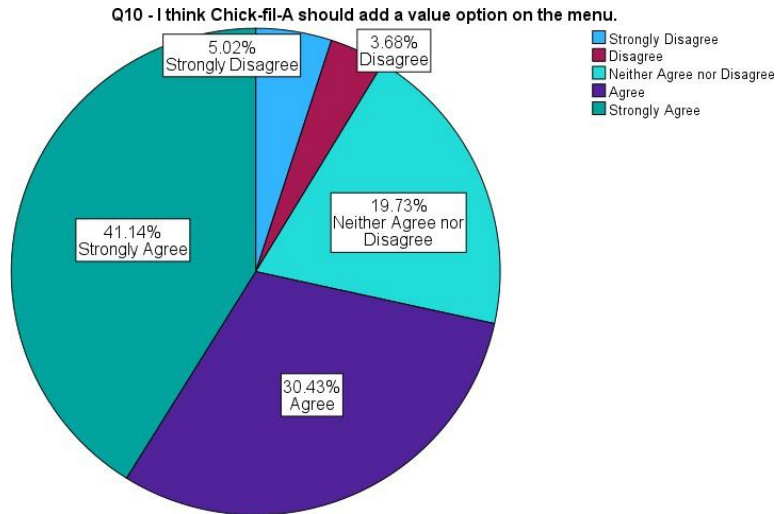
- • The data shows that most of the sample has a positive outlook on the question of adding a value menu option. Those who responded "Agree" or "Strongly Agree" make up a total of 71.57% of respondents.
- • Furthermore, the average response on a 5-point scale is 3.99. This high mean is consistent with the high percentage of respondents who Agreed or Strongly Agreed with the above statement.
- • **Managerial Conclusion**: The team recommends that Chick-fil-A considers adding a value option on the menu due to the positive response of the question. To target and improve upon those responses, the team also recommended targeting the neutral group which is compiled of 19.73%.

Q10 - I like the Chick-fil-A rewards system.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	2.8	3.0	3.0
	Disagree	12	3.8	4.0	7.0
	Neither Agree nor Disagree	80	25.2	26.8	33.8
	Agree	89	28.0	29.8	63.5
	Strongly Agree	109	34.3	36.5	100.0
	Total	299	94.0	100.0	
Missing	System	19	6.0		
Total		318	100.0		

Q10 - I like the Chick-fil-A rewards system.
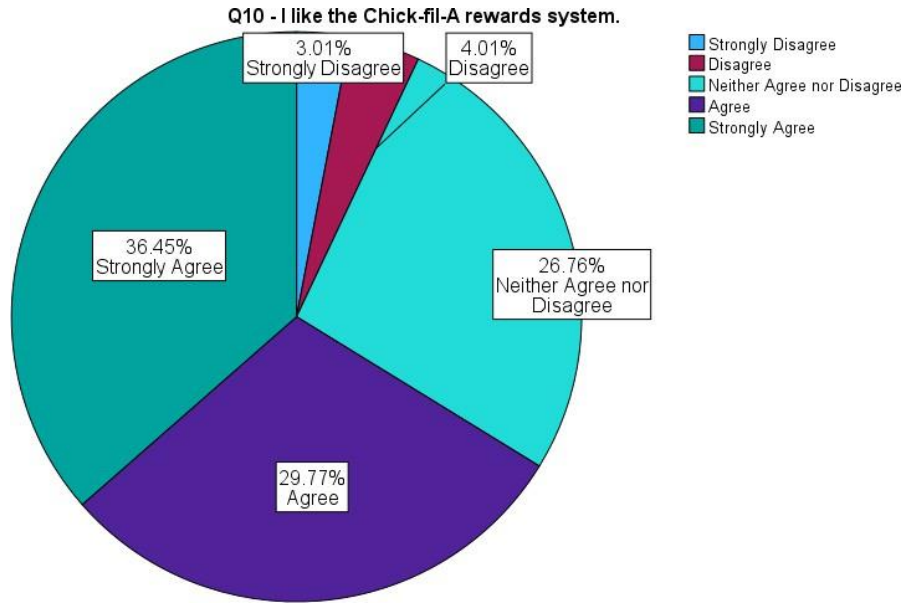
- The data shows that most of the sample has a positive outlook on the question of adding a rewards system. Those who responded agree or strongly agree make up a total of 66.22%
- Furthermore, the average response on a 5-point scale is 3.93. This high mean is consistent with the high percentage of respondents who Agreed or Strongly Agreed.
- **Managerial Conclusion**: The data shows that most of the sample has a positive outlook on the question of liking the rewards system. To target and improve upon those responses, the team also recommended targeting the neutral group which is compiled of 26.76%.

Q10 - I would prefer for Chick-fil-A to be open 7 days a week.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	31	7.9	10.3	10.3
	Disagree	51	13.0	17.0	27.3
	Neither Agree nor Disagree	61	15.6	20.3	47.7
	Agree	72	18.4	24.0	71.7
	Strongly Agree	85	21.7	28.3	100.0
	Total	300	76.7	100.0	
Missing	System	91	23.3		
Total		391	100.0		

111

Q10 - I would prefer for Chick-fil-A to be open 7 days a week.

Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

10.33%
Strongly Disagree

28.33%
Strongly Agree

17.00%
Disagree

24.00%
Agree

20.33%
Neither Agree nor Disagree
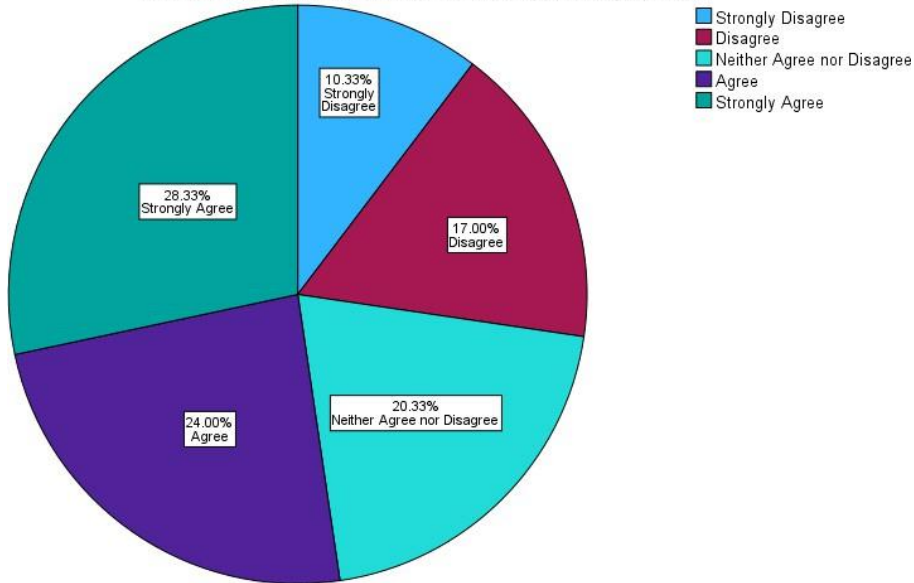
• The data shows that most of the sample has a positive outlook on the question of being open 7-days a week. Those who responded agree or strongly agree make up a total of 52.51%.
• Furthermore, the average response on a 5-point scale is 3.44. This high mean is consistent with the high percentage of respondents who Agreed or Strongly Agreed.
• **Managerial Conclusion**: The data shows that most of the sample has a positive outlook on the question of Preferring Chick-fil-A being open 7 days a week. To target and improve upon those responses, the team recommends possibly extending their days of operation.

Comparison of Means
Chick-fil-A
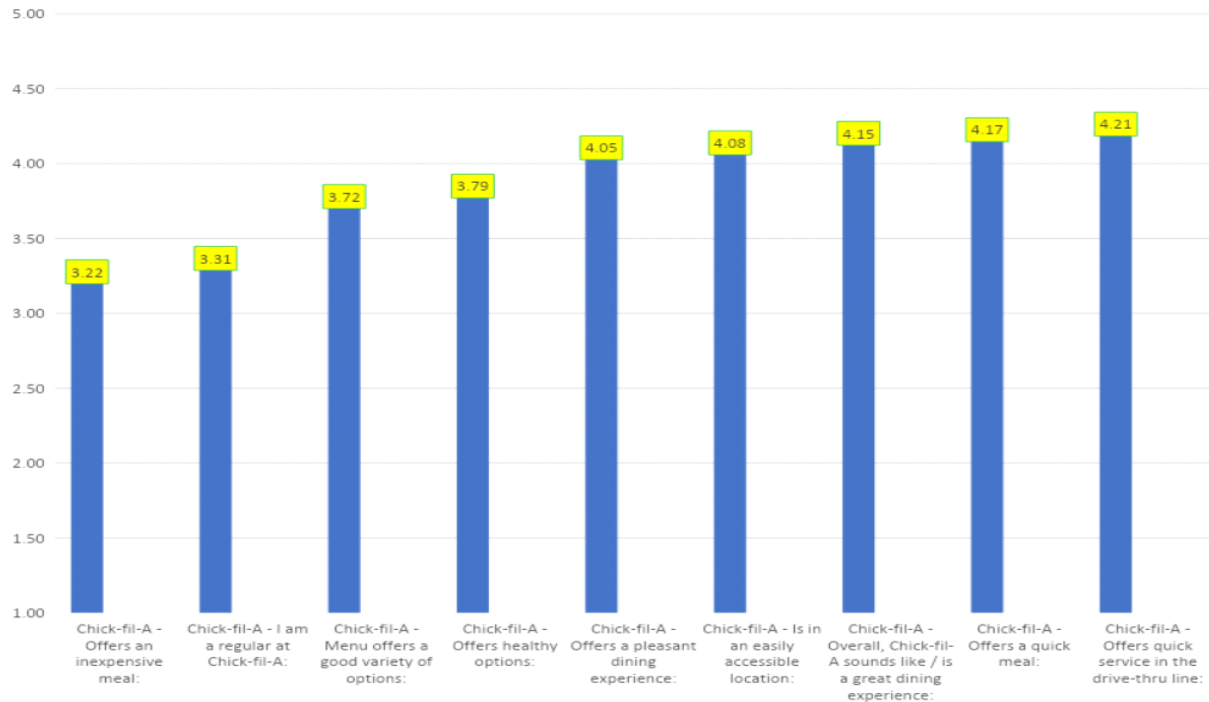
When asking various questions about Chick-fil-A, most customers had a positive outlook on the company. Most respondents either chose either "Agree" or "Strongly Agree," as most of the average scores were 3 and higher. A 1 represented "Strongly Disagree," and a 5 represented "Strongly Agree." Based upon the above means, it is clear that Chick-fil-A is doing well in many facets of the fast-food industry.

Managerial Conclusions

The team recommends that Chick-fil-A keeps up its current policies, as most people find their work satisfactory. However, the company can improve in areas such as price point, menu variety, and healthy options. These improvements could also increase the number of people who consider themselves "regulars" at Chick-fil-A. Although many people agree that Chick-fil-A offers an inexpensive meal and that they are regulars at Chick-fil-A, these two points have means that are significantly different from 3. By improving in these two fields, Chick-fil-A can improve overall consumer perception and retention. Chick-fil-A is exceeding in areas such as great dining experience, offering a quick meal, and having quick drive-thru service.

Popeyes
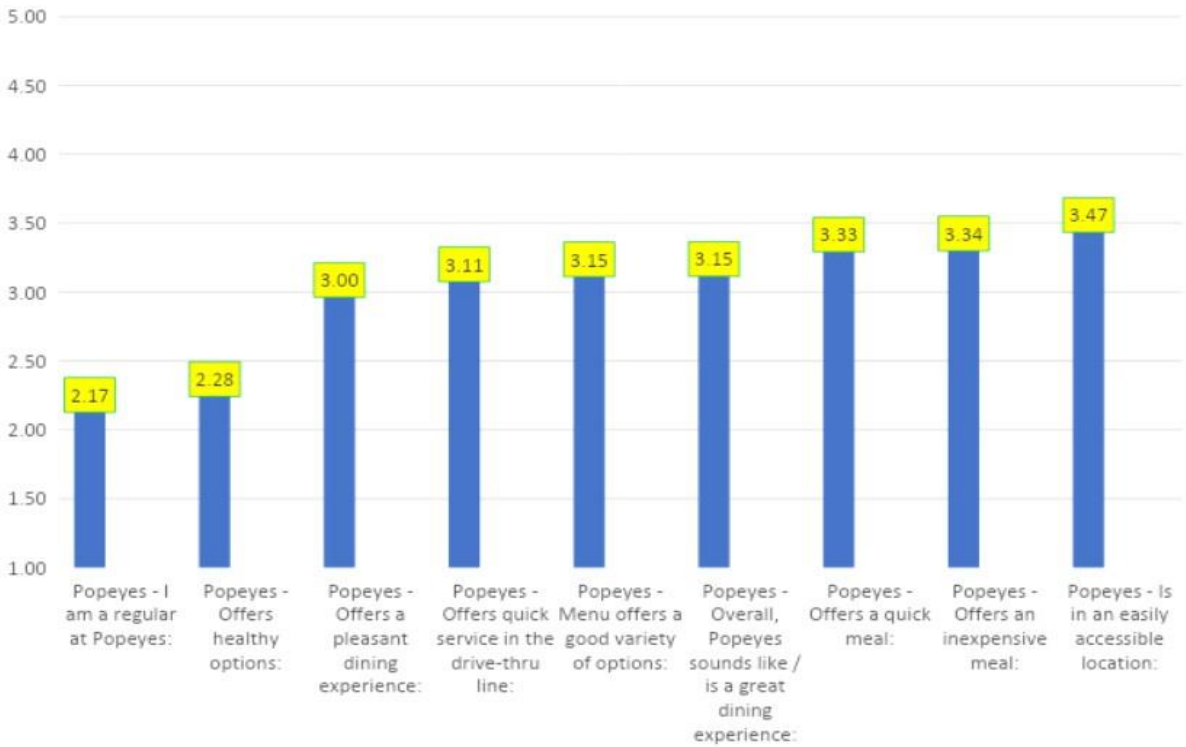
When asking various questions about Popeyes, most customers had a relatively positive outlook on the company. However, Popeyes does have areas that need improvement if they are wishing to compete with a fast-food giant like Chick-fil-A, which is doing a much better job than them in particular fields. The bar charts displayed above give a visual representation of customer perceptions of Popeyes. The average scores for Popeyes were between 2 and 4, with 2 representing "Disagree," and 4 representing "Agree."

Managerial Conclusions

Popeyes needs to improve in multiple areas if they want to compete with Chick-fil-A more effectively. Chick-fil-A is scoring far higher in all of the above categories. For this survey, Chick-fil-A is heavily favored in categories such as service in the drive-thru line, offering a quick meal, being in an easily accessible location, offering a pleasant dining experience, and being an overall great dining experience.

Comparison of Means

The two charts expressed on the page above show the mean scores for the Chick-fil-A and Popeyes-specific questions on this questionnaire. The questions asked were the exact same between the two restaurants, but their averages were very different based on how the respondents answered the Likert questions. For this questionnaire, 1 represented "Strongly Disagree," 3 represented "Neither Agree nor Disagree," and 5 represented "Strongly Agree."

The top set of means shows Chick-fil-A's scores, and the bottom set of means shows Popeyes' scores. On attributes such as dining experience, accessible locations, speediness of the meal, and drive-thru service, Chick-fil-A scored above a 4. On attributes such as healthy options, inexpensive

meals, being a Chick-fil-A regular, and menu variety, Chick-fil-A scored between a 3.2 and 3.8. Popeyes did not score above a 4 in any aspect. Their averages ranged from 2.17 to 3.47.

The team recommends that Chick-fil-A continue with their current business practices in terms of the items that ranked above a 4. By adding more/ healthier options to their current menu, they would have the opportunity to increase customer satisfaction and possibly increase the amount of regulars at Chick-fil-A.

Hypothesis test or T-tests
Hypothesis Test for the Proportion of Females
Step 1: Ho: P=Po; Ha: P ≠ Po (Po represents the proportion of females in the Georgia population)

Step 2:
$$Z_c = \frac{p - P_o}{s_p} \quad s_p = \sqrt{\frac{P_o \times (1 - P_o)}{n}}$$

Step 3:   Zt from table = ± 2.58 (α = 0.01)

Step 4: Calculate Zc from Step 2, where p = .473 (sample proportion), Po = .5263 (52.63%), and n= 313 (52.63% female population in Georgia is based on the data from https://statisticstimes.com/demographics/country/georgia-demographics.php)

Sp= √.5236 x (1- .5236)/ 313= **.0283** —-> Zt= (.473- .5263)/ .028 = **-1.8**

Step 5:
Zt=± **2.58** Zc=**-1.8**
The team will fail to reject the null hypothesis. The percentage of females in this sample is not significantly different from the percentage of females in Georgia. This sample is representative of the population in terms of gender.

Hypothesis Test for the Proportion of Caucasians
Step 1: Ho: P=Po; Ha: P≠ Po (Po represents the proportion of Caucasians in the Georgia population)

Step 2:
$$Z_c = \frac{p - P_o}{s_p} \quad s_p = \sqrt{\frac{P_o \times (1 - P_o)}{n}}$$

Step 3: Zt from table = ± 2.58 (α = 0.01)

Step 4: Calculate Zc from Step 2, where p = .4164 (sample proportion), Po = .5585 (55.85%), and n=313 (55.85% Caucasian population in Georgia is based on the data from https://worldpopulationreview.com/states/georgia-population)

Sp= √.5585 x (1- .5585)/ 313= **.028** —-> Zt= (.4164- .5585)/ .028= **-5.075**
Step 5:
Zt=± **2.58** Zc=**-5.075**

The team will reject the Ho, as this sample <u>is significantly different</u> from the percentage of Caucasians in Georgia. The team's sample is not representative of the population in terms of ethnicity.

<u>**One-Sample T-Tests**</u>
One-Sample T-Tests: T-Test (Preference Questions)

Test of One Mean	Mean
Preference for Drive-Through rather than Sit-Down: With family	2.64
Preference for Drive-Through rather than Sit-Down: Eating alone	4.32
Preference for Drive-Through rather than Sit-Down: With college friends	3.56
Preference for Drive-Through rather than Sit-Down: On a date	2.23

Test of One Mean Test Value =3	t	One-Sided p	Two-Sided p
Preference for Drive-Through rather than Sit-Down: With family	-4.821	<.001	<.001
Preference for Drive-Through rather than Sit-Down: Eating alone	21.761	<.001	<.001
Preference for Drive-Through rather than Sit-Down: With college friends	7.891	<.001	<.001
Preference for Drive-Through rather than Sit-Down: On a date	-10.439	<.001	<.001

Test of One Mean Test Value =4	t	One-Sided p	Two-Sided p
Preference for Drive-Through rather than Sit-Down: With family	-18.295	<.001	<.001
Preference for Drive-Through rather than Sit-Down: Eating alone	5.242	<.001	<.001
Preference for Drive-Through rather than Sit-Down: With college friends	-6.322	<.001	<.001
Preference for Drive-Through rather than Sit-Down: On a date	-23.949	<.001	<.001

The following variables had means significantly greater than 4:
• Preference for Drive-Through rather than Sit-Down: Eating alone
The following variables had means insignificantly different from 4: None
The following variables had means significantly less than 4, but significantly greater than 3:
• Preference for Drive-Through rather than Sit-Down: With college friends
The following variables had means insignificantly different from 3: **None**
The following variables had means significantly less than 3:
• Preference for Drive-Through rather than Sit-Down: With Family
• Preference for Drive-Through rather than Sit-Down: On a Date
Managerial Conclusion: The sample data shows that respondents typically do not prefer to use the drive-through with family and on dates, as they both had means that were less than 3. Using the drive-though when alone has a mean that is significantly greater than 4. The respondents who prefer to sit down with college friends have a mean that is significantly less than 4, but significantly higher than 3. The data shows that respondents typically value the dine-in option when in familial or social settings. When dining alone, respondents seem to use the drive-through option versus dining in.

One-Sample T-Tests: T-Test (Chick-fil-A Questions)

Test of One Mean	Mean
Chick-fil-A - I am a regular at Chick-fil-A:	3.31
Chick-fil-A - Offers a quick meal:	4.17
Chick-fil-A - Offers an inexpensive meal:	3.22
Chick-fil-A - Offers a pleasant dining experience:	4.05
Chick-fil-A - Menu offers a good variety of options:	3.72
Chick-fil-A - Offers quick service in the drive-thru line:	4.21
Chick-fil-A - Offers healthy options:	3.79
Chick-fil-A - Is in an easily accessible location:	4.08
Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:	4.15

Test of One Mean Test Value =3	t	One-Sided p	Two-Sided p
Chick-fil-A - I am a regular at Chick-fil-A:	4.254	<.001	<.001
Chick-fil-A - Offers a quick meal:	23.649	<.001	<.001
Chick-fil-A - Offers an inexpensive meal:	3.758	<.001	<.001
Chick-fil-A - Offers a pleasant dining experience:	20.547	<.001	<.001
Chick-fil-A - Menu offers a good variety of options:	12.439	<.001	<.001
Chick-fil-A - Offers quick service in the drive-thru line:	22.680	<.001	<.001
Chick-fil-A - Offers healthy options:	13.525	<.001	<.001
Chick-fil-A - Is in an easily accessible location:	20.732	<.001	<.001
Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:	22.767	<.001	<.001

Test of One Mean Test Value =4	t	One-Sided p	Two-Sided p
Chick-fil-A - I am a regular at Chick-fil-A:	-9.412	<.001	<.001
Chick-fil-A - Offers a quick meal:	3.446	<.001	<.001
Chick-fil-A - Offers an inexpensive meal:	-13.210	<.001	<.001
Chick-fil-A - Offers a pleasant dining experience:	.978	.164	.329
Chick-fil-A - Menu offers a good variety of options:	-4.736	<.001	<.001
Chick-fil-A - Offers quick service in the drive-thru line:	3.906	<.001	<.001
Chick-fil-A - Offers healthy options:	-3.509	<.001	<.001
Chick-fil-A - Is in an easily accessible location:	1.595	.056	.112
Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:	2.912	.002	.004

The following variables had means significantly greater than 4:
- Chick-fil-A - Offers a quick meal
- Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience
- Chick-fil-A - Offers quick service in the drive-thru line

The following variables had means insignificantly different from 4:
- Chick-fil-A - Offers a pleasant dining experience
- Chick-fil-A - Is in an easily accessible location

The following variables had means significantly less than 4, but greater than 3:
- Chick-fil-A - I am a regular at Chick-fil-A
- Chick-fil-A - Offers healthy options
- Chick-fil-A - Menu offers a good variety of options
- Chick-fil-A - Offers an inexpensive meal

Managerial Conclusion: Data shows that respondents all have a mean greater than 3 in all aspects of the questions, proving that Chick-fil-A is moving in the right direction in terms of how they operate their business. They are particularly thriving in the areas "offers a quick meal," "sounds like/is a great dining experience," and "offers quick service in the drive-thru line." These areas all have a mean greater than 4. To give an idea of improvement, they can improve upon their menu

variety to appeal to a broader range of customers, as the mean for this question is significantly less than 4, but is greater than 3

One-Sample T-Tests: T-Test (Popeyes Questions)

Test of One Mean	Mean
Popeyes - I am a regular at Popeyes:	2.17
Popeyes - Offers a quick meal:	3.33
Popeyes - Offers an inexpensive meal:	3.34
Popeyes - Offers a pleasant dining experience:	3.00
Popeyes - Menu offers a good variety of options:	3.15
Popeyes - Offers quick service in the drive-thru line:	3.11
Popeyes - Offers healthy options:	2.28
Popeyes - Is in an easily accessible location:	3.47
Popeyes - Overall, Popeyes sounds like / is a great dining experience:	3.15

Test of One Mean Test Value = 3	t	Significance One-Sided p	Significance Two-Sided p
Popeyes - I am a regular at Popeyes:	-12.597	<.001	<.001
Popeyes - Offers a quick meal:	5.684	<.001	<.001
Popeyes - Offers an inexpensive meal:	6.104	<.001	<.001
Popeyes - Offers a pleasant dining experience:	.000	.500	1.000
Popeyes - Menu offers a good variety of options:	2.593	.005	.010
Popeyes - Offers quick service in the drive-thru line:	1.824	.035	.069
Popeyes - Offers healthy options:	-13.260	<.001	<.001
Popeyes - Is in an easily accessible location:	8.040	<.001	<.001
Popeyes - Overall, Popeyes sounds like / is a great dining experience:	2.711	.004	.007

Test of One Mean Test Value = 4	t	Significance One-Sided p	Significance Two-Sided p
Popeyes - I am a regular at Popeyes:	-27.704	<.001	<.001
Popeyes - Offers a quick meal:	-11.541	<.001	<.001
Popeyes - Offers an inexpensive meal:	-11.966	<.001	<.001
Popeyes - Offers a pleasant dining experience:	-19.032	<.001	<.001
Popeyes - Menu offers a good variety of options:	-14.692	<.001	<.001
Popeyes - Offers quick service in the drive-thru line:	-14.220	<.001	<.001
Popeyes - Offers healthy options:	-31.676	<.001	<.001
Popeyes - Is in an easily accessible location:	-9.010	<.001	<.001
Popeyes - Overall, Popeyes sounds like / is a great dining experience:	-15.028	<.001	<.001

The following variables had means significantly greater than 4: None

The following variables had means insignificantly different from 4: None

The following variables had means significantly less than 4, but greater than 3:
- Popeyes - Offers a quick meal
- Popeyes - Offers an inexpensive meal

- • Popeyes - Menu offers a good variety of options
- • Popeyes - Overall, Popeyes sounds like/ is a great dining experience
- • Popeyes - Is in an easily accessible location

The following variables had means insignificantly different from 3:
- • Popeyes - Pleasant Dining Experience
- • Popeyes - Quick service in drive thru line

The following variables had means significantly less than 3:
- • Popeyes - I am a regular at Popeyes
- • Popeyes - Offers healthy options

Managerial Conclusion:

Based on this sample, most people "Agree" but not "Strongly Agree" with many of Popeyes business practices. Some areas have a mean significantly lower than 3, which means that respondents generally don't agree with those particular points. These points include offering healthy options and being a regular at Popeyes. The rest of the data is insignificantly different from 3, or significantly less than 4 but greater than 3.

One-Sample T-Tests: T-Test (Additional Questions)

	N	Mean	Std. Deviation	Std. Error Mean
Q10 - I think Chick-fil-A should add a value option on the menu.	299	3.99	1.101	.064
Q10 - I like the Chick-fil-A rewards system.	299	3.93	1.030	.060
Q10 - I would prefer for Chick-fil-A to be open 7 days a week.	299	3.44	1.328	.077

Test Value = 3

	t	df	Significance One-Sided p	Significance Two-Sided p	Mean Difference	95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper
Q10 - I think Chick-fil-A should add a value option on the menu.	15.554	298	<.001	<.001	.990	.86	1.12
Q10 - I like the Chick-fil-A rewards system.	15.547	298	<.001	<.001	.926	.81	1.04
Q10 - I would prefer for Chick-fil-A to be open 7 days a week.	5.704	298	<.001	<.001	.438	.29	.59

Test Value = 4

	t	df	Significance One-Sided p	Significance Two-Sided p	Mean Difference	95% Confidence Interval of the Difference Lower	95% Confidence Interval of the Difference Upper
Q10 - I think Chick-fil-A should add a value option on the menu.	-.158	298	.437	.875	-.010	-.14	.12
Q10 - I like the Chick-fil-A rewards system.	-1.235	298	.109	.218	-.074	-.19	.04
Q10 - I would prefer for Chick-fil-A to be open 7 days a week.	-7.316	298	<.001	<.001	-.562	-.71	-.41

The following variables had means significantly greater than 4: None
The following variables had means insignificantly different from 4:
- • I think Chick-fil-a should add a value option on the menu.

- I like the Chick-fil-a reward system.

The following variables had means significantly less than 4, but greater than 3:

- I would prefer for Chick-fil-a to be open 7 days a week.

Managerial Conclusion: Based on the results, most respondents seem satisfied with the reward system and the idea of Chick-fil-a adding a value menu. This is something that Chick-fil-A can focus on implementing in the near future to help with overall satisfaction. Something they can also work towards in the future is being open 7 Days a week, as the mean for this question is greater than 3 but significantly less than 4

Hypothesis Tests: Independent Samples T-Tests: Race

	Race:	Mean
Preference for Drive-Through rather than Sit-Down: With family	Black/African American	2.94
	White/ Caucasian	2.33
Preference for Drive-Through rather than Sit-Down: Eating alone	Black/African American	4.24
	White/ Caucasian	4.55
Preference for Drive-Through rather than Sit-Down: With college friends	Black/African American	3.54
	White/ Caucasian	3.63
Preference for Drive-Through rather than Sit-Down: On a date	Black/African American	2.35
	White/ Caucasian	2.04

		t	One-Sided p	Two-Sided p
Preference for Drive-Through rather than Sit-Down: With family	Equal variances assumed	3.987	<.001	<.001
	Equal variances not assumed	4.022	<.001	<.001
Preference for Drive-Through rather than Sit-Down: Eating alone	Equal variances assumed	-2.547	.006	.011
	Equal variances not assumed	-2.585	.005	.010
Preference for Drive-Through rather than Sit-Down: With college friends	Equal variances assumed	-.569	.285	.570
	Equal variances not assumed	-.571	.284	.568
Preference for Drive-Through rather than Sit-Down: On a date	Equal variances assumed	2.004	.023	.046
	Equal variances not assumed	2.017	.022	.045

The following variables showed no significant difference between African Americans and Caucasians:
• Preference for Drive-Through rather than Sit-Down: With college friends
The following variables showed significantly higher means for African Americans:
• Preference for Drive-Through rather than Sit-Down: With family
• Preference for Drive-Through rather than Sit-Down: On a date
The following variables showed significantly higher means for Caucasians:
• Preference for Drive-Through rather than Sit-Down: Eating alone
Managerial Conclusion: The data shows that having a preference for drive-thru when with friends shows no significant difference between African Americans and Caucasians. However, when with family or on a date, African Americans show a significantly higher mean. When eating alone, Caucasians show a higher mean.

Hypothesis Tests: Independent Samples T-Tests: Race

	Race:	N	Mean
Chick-fil-A - I am a regular at Chick-fil-A:	Black/African American	139	3.37
	White/ Caucasian	129	3.33
Chick-fil-A - Offers a quick meal:	Black/African American	136	4.10
	White/ Caucasian	129	4.36
Chick-fil-A - Offers an inexpensive meal:	Black/African American	135	3.17
	White/ Caucasian	129	3.30
Chick-fil-A - Offers a pleasant dining experience:	Black/African American	137	3.99
	White/ Caucasian	129	4.19
Chick-fil-A - Menu offers a good variety of options:	Black/African American	138	3.78
	White/ Caucasian	129	3.69
Chick-fil-A - Offers quick service in the drive-thru line:	Black/African American	136	4.15
	White/ Caucasian	128	4.33
Chick-fil-A - Offers healthy options:	Black/African American	138	3.77
	White/ Caucasian	129	3.86
Chick-fil-A - Is in an easily accessible location:	Black/African American	138	4.04
	White/ Caucasian	128	4.16
Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:	Black/African American	137	4.12
	White/ Caucasian	129	4.26

		One-Sided p	Two-Sided p
Chick-fil-A - I am a regular at Chick-fil-A:	Equal variances assumed	.269	.394	.788
	Equal variances not assumed	.268	.394	.789
Chick-fil-A - Offers a quick meal:	Equal variances assumed	-2.645	.004	.009
	Equal variances not assumed	-2.659	.004	.008
Chick-fil-A - Offers an inexpensive meal:	Equal variances assumed	-1.097	.137	.274
	Equal variances not assumed	-1.098	.137	.273
Chick-fil-A - Offers a pleasant dining experience:	Equal variances assumed	-1.962	.025	.051
	Equal variances not assumed	-1.963	.025	.051
Chick-fil-A - Menu offers a good variety of options:	Equal variances assumed	.708	.240	.480
	Equal variances not assumed	.705	.241	.482
Chick-fil-A - Offers quick service in the drive-thru line:	Equal variances assumed	-1.669	.048	.096
	Equal variances not assumed	-1.673	.048	.095

Chick-fil-A - Offers healthy options:	Equal variances assumed	-.764	.223	.445
	Equal variances not assumed	-.764	.223	.445
Chick-fil-A - Is in an easily accessible location:	Equal variances assumed	-1.214	.113	.226
	Equal variances not assumed	-1.217	.112	.225
Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:	Equal variances assumed	-1.377	.085	.170
	Equal variances not assumed	-1.379	.085	.169
Chick-fil-A - Offers healthy options:	Equal variances assumed	-.764	.223	.445
	Equal variances not assumed	-.764	.223	.445
Chick-fil-A - Is in an easily accessible location:	Equal variances assumed	-1.214	.113	.226
	Equal variances not assumed	-1.217	.112	.225
Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:	Equal variances assumed	-1.377	.085	.170
	Equal variances not assumed	-1.379	.085	.169

The following variables showed no significant difference between African Americans and Caucasians:
•   Chick-fil-A - I am a regular at Chick-fil-A
•   Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience
•   Chick-fil-A - Is in an easily accessible location
•   Chick-fil-A - Offers healthy options
•   Chick-fil-A - Menu offers a good variety of options
•   Chick-fil-A - Offers an inexpensive meal
The following variables showed significantly higher means for Caucasians:
•   Chick-fil-A - Offers quick service in the drive-thru line
•   Chick-fil-A - Offers a pleasant dining experience
•   Chick-fil-A - Offers a quick meal

Managerial Conclusion: Data shows that African Americans and Caucasians show no significant difference when it comes to being a regular customer, a great dining experience, being in an accessible location, offering health options as well as a good variety, and offering an inexpensive meal when it comes to Chick-fil-A. However, there is a significant difference with Caucasians having a higher mean when it comes to quick service in the drive-thru line, offering a pleasant dining experience, and offering a quick meal. Managers should implement strategies to focus on the Caucasian demographic in those areas.

Hypothesis Tests: Independent Samples T-Tests: Race

	Race:	N	Mean
Popeyes - I am a regular at Popeyes:	Black/African American	139	2.58
	White/ Caucasian	128	1.75
Popeyes - Offers a quick meal:	Black/African American	138	3.42
	White/ Caucasian	128	3.27
Popeyes - Offers an inexpensive meal:	Black/African American	138	3.30
	White/ Caucasian	128	3.45
Popeyes - Offers a pleasant dining experience:	Black/African American	138	3.11
	White/ Caucasian	127	2.91
Popeyes - Menu offers a good variety of options:	Black/African American	138	3.39
	White/ Caucasian	128	2.88
Popeyes - Offers quick service in the drive-thru line:	Black/African American	137	3.12
	White/ Caucasian	128	3.13
Popeyes - Offers healthy options:	Black/African American	138	2.36
	White/ Caucasian	128	2.19
Popeyes - Is in an easily accessible location:	Black/African American	137	3.64
	White/ Caucasian	128	3.34
Popeyes - Overall, Popeyes sounds like / is a great dining experience:	Black/African American	139	3.32
	White/ Caucasian	128	2.96

		t	One-Sided p	Two-Sided p
Popeyes - I am a regular at Popeyes:	Equal variances assumed	6.267	<.001	<.001
	Equal variances not assumed	6.351	<.001	<.001
Popeyes - Offers a quick meal:	Equal variances assumed	1.190	.118	.235
	Equal variances not assumed	1.188	.118	.236
Popeyes - Offers an inexpensive meal:	Equal variances assumed	-1.291	.099	.198
	Equal variances not assumed	-1.295	.098	.196
Popeyes - Offers a pleasant dining experience:	Equal variances assumed	1.866	.032	.063
	Equal variances not assumed	1.869	.031	.063
Popeyes - Menu offers a good variety of options:	Equal variances assumed	4.423	<.001	<.001
	Equal variances not assumed	4.427	<.001	<.001

Popeyes - Offers quick service in the drive-thru line:	Equal variances assumed	-.121	.452	.903
	Equal variances not assumed	-.122	.452	.903
Popeyes - Offers healthy options:	Equal variances assumed	1.466	.072	.144
	Equal variances not assumed	1.471	.071	.142
Popeyes - Is in an easily accessible location:	Equal variances assumed	2.507	.006	.013
	Equal variances not assumed	2.487	.007	.014
Popeyes - Overall, Popeyes sounds like / is a great dining experience:	Equal variances assumed	3.045	.001	.003
	Equal variances not assumed	3.035	.001	.003

The following variables showed no significant difference between African Americans and Caucasians:
- Popeyes - Offers healthy options
- Popeyes - Offers quick service in the drive-thru line
- Popeyes - Offers an inexpensive meal
- Popeyes - Offers a quick meal

The following variables showed significantly higher means for African Americans:
- Popeyes - Overall, Popeyes sounds like / is a great dining experience
- Popeyes - Is in an easily accessible location
- Popeyes - Menu offers a good variety of options

- Popeyes - Offers a pleasant dining experience
- Popeyes - I am a regular at Popeyes

Managerial Conclusion: Data shows that when it comes to Popeyes, there is no significant difference between African Americans and Caucasians when it comes to offering healthy options, quick drive-thru service, offering an inexpensive meal, and offering a quick meal. However, there is a significant difference with African Americans having higher means when it comes to Popeyes being a pleasant experience, being in an accessible location, offering a variety of options, offering a pleasant dining experience, and being a regular at Popeyes. Managers should implement strategies to focus on the African American demographic in those areas.

Hypothesis Tests: Independent Samples T-Tests: Race

	Race:	N	Mean
I Prefer: - 1	Black/African American	127	2.37
	White/ Caucasian	114	1.74
I would prefer for Chick-fil-A to be open 7 days a week.	Black/African American	138	3.57
	White/ Caucasian	128	3.38
I like the Chick-fil-A rewards system.	Black/African American	138	3.85
	White/ Caucasian	128	4.12
I think Chick-fil-A should add a value option on the menu.	Black/African American	138	3.96
	White/ Caucasian	128	4.09

		t	One-Sided p	Two-Sided p
I Prefer: - 1	Equal variances assumed	3.936	<.001	<.001
	Equal variances not assumed	3.975	<.001	<.001
I would prefer for Chick-fil-A to be open 7 days a week.	Equal variances assumed	1.209	.114	.228
	Equal variances not assumed	1.201	.116	.231
I like the Chick-fil-A rewards system.	Equal variances assumed	-2.207	.014	.028
	Equal variances not assumed	-2.210	.014	.028
I think Chick-fil-A should add a value option on the menu.	Equal variances assumed	-.923	.178	.357
	Equal variances not assumed	-.924	.178	.356

The following variables showed no significant difference between African Americans and Caucasians:
- I would prefer for Chick-fil-A to be open 7 days a week.
- I think Chick-fil-A should add a value option on the menu.

The following variables showed significantly higher means for Caucasians:
- I like the Chick-fil-A rewards system.

Managerial Conclusion: The data shows that there is no significant difference between African Americans and Caucasians when it comes to preferring Chick-fil-a to be open 7 days a week and adding a value menu options. However, there is a significant difference with Caucasians having a higher mean when it comes to liking the Chick-fil-A rewards system. Managers should implement strategies to focus on the Caucasian demographic in those areas.

Hypothesis Tests: Independent Samples T-Tests: Gender

	Gender:	N	Mean
Preference for Drive-Through rather than Sit-Down: With family	Male	147	2.54
	Female	147	2.73
Preference for Drive-Through rather than Sit-Down: Eating alone	Male	147	4.41
	Female	146	4.23
Preference for Drive-Through rather than Sit-Down: With college friends	Male	145	3.55
	Female	144	3.52
Preference for Drive-Through rather than Sit-Down: On a date	Male	144	2.13
	Female	145	2.29

		t	One-Sided p	Two-Sided p
Preference for Drive-Through rather than Sit-Down: With family	Equal variances assumed	-1.246	.107	.214
	Equal variances not assumed	-1.246	.107	.214
Preference for Drive-Through rather than Sit-Down: Eating alone	Equal variances assumed	1.448	.074	.149
	Equal variances not assumed	1.448	.074	.149
Preference for Drive-Through rather than Sit-Down: With college friends	Equal variances assumed	.211	.417	.833
	Equal variances not assumed	.211	.417	.833
Preference for Drive-Through rather than Sit-Down: On a date	Equal variances assumed	-1.032	.151	.303
	Equal variances not assumed	-1.032	.151	.303

The following variables showed no significant difference between Males and Females:
• Preference for Drive-Through rather than Sit-Down: With family
• Preference for Drive-Through rather than Sit-Down: Eating alone
• Preference for Drive-Through rather than Sit-Down: With college friends
• Preference for Drive-Through rather than Sit-Down: On a date

Managerial Conclusion: There is no statistical difference between males and females in terms of preference for drive-through rather than sit down dining at Chick-Fil-A for all of the above variables. There is not a significantly higher mean for any variable, so Chick-Fil-A should not differ in strategies between males and females when it comes to preference for drive-through rather than sit-down.

Hypothesis Tests: Independent Samples T-Tests: Gender

	Gender:	N	Mean
Chick-fil-A - I am a regular at Chick-Iii-A:	Male	138	3.25
	Female	145	3.44
Chick-fil-A - Offers a quick meal:	Male	138	4.17
	Female	142	4.23
Chick-fil-A - Offers an inexpensive meal:	Male	138	3.14
	Female	141	3.33
Chick-fil-A - Offers a pleasant dining experience:	Male	138	3.97
	Female	143	4.15
Chick-fil-A - Menu offers a good variety of options:	Male	139	3.67
	Female	143	3.83
Chick-fil-A - Offers quick service in the drive-thru line:	Male	138	4.19
	Female	141	4.26
Chick-fil-A - Offers healthy options:	Male	139	3.71
	Female	143	3.93
Chick-fil-A - Is in an easily accessible location:	Male	138	4.01
	Female	143	4.20
Chick-fil-A - Overall, Chick-fil-A sounds like/ is a great dining experience:	Male	138	4.12
	Female	143	4.22

		t	One-Sided p	Two-Sided p
Chick-fil-A - I am a regular at Chick-fil-A:	Equal variances assumed	-1.311	.095	.191
	Equal variances not assumed	-1.310	.096	.191
Chick-fil-A - Offers a quick meal:	Equal variances assumed	-.661	.255	.509
	Equal variances not assumed	-.659	.255	.510
Chick-fil-A - Offers an inexpensive meal:	Equal variances assumed	-1.495	.068	.136
	Equal variances not assumed	-1.494	.068	.136
Chick-fil-A - Offers a pleasant dining experience:	Equal variances assumed	-1.668	.048	.096
	Equal variances not assumed	-1.662	.049	.098

Chick-fil-A - Menu offers a good variety of options:	Equal variances assumed	-1.326	.093	.186
	Equal variances not assumed	-1.325	.093	.186
Chick-fil-A - Offers quick service in the drive-thru line:	Equal variances assumed	-.619	.268	.537
	Equal variances not assumed	-.619	.268	.536
Chick-fil-A - Offers healthy options:	Equal variances assumed	-1.830	.034	.068
	Equal variances not assumed	-1.823	.035	.069
Chick-fil-A - Is in an easily accessible location:	Equal variances assumed	-1.781	.038	.076
	Equal variances not assumed	-1.776	.038	.077
Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:	Equal variances assumed	-.986	.162	.325
	Equal variances not assumed	-.985	.163	.325

The following variables showed no significant difference between Males and Females:
• Chick-fil-A – I am a regular at Chick-fil-A:
• Chick-fil-A - Offers a quick meal:
• Chick-fil-A - Offers an inexpensive meal:
• Chick-fil-A - Menu offers a good variety of options:
• Chick-fil-A - Offers quick service in the drive-thru line:
• Chick-fil-A - Is in an easily accessible location:

The following variables showed significantly higher means for Females:
• Chick-fil-A - Offers a pleasant dining experience
• Chick-fil-A - Offers healthy options
• Chick-fil-A - Is in an easily accessible location

Managerial Conclusion: There is no statistical difference between males and females in the following variables: I am a regular at Chick-fil-A, offers a quick meal, offers an inexpensive meal, menu offers a good variety of options, offers quick service in the drive-thru line, and is in an easily accessible location. There are significantly higher means for females in the following variables: offers a pleasant dining experience, offers healthy options, and is in an easily accessible location. This means that Chick-Fil-A could benefit from asking female patrons what locations are more easily accessible, what options could be added for more healthy food choices, and what can be done to create a more pleasant dining experience. Although the female segment has a higher mean for these particular variables, there would be no harm for Chick-fil-A management to ask the opinions of their male patrons as well. This will allow for the broadest range of opinions to be included.

Hypothesis Tests: Independent Samples T-Tests: Gender

	Gender:	N	Mean
Popeyes - I am a regular at Popeyes:	Male	139	2.14
	Female	**144**	2.22
Popeyes - Offers a quick meal:	Male	139	3.24
	Female	**143**	3.41
Popeyes - Offers an inexpensive meal:	Male	139	3.40
	Female	142	3.35
Popeyes - Offers a pleasant dining experience:	Male	**138**	2.99
	Female	143	3.06
Popeyes - Menu offers a good variety of options:	Male	139	3.22
	Female	**143**	3.13
Popeyes - Offers quick service in the drive-thru line:	Male	139	3.09
	Female	142	3.23
Popeyes - Offers healthy options:	Male	**139**	2.19
	Female	143	2.40
Popeyes - Is in an easily accessible location:	Male	139	3.55
	Female	142	3.42
Popeyes - Overall, Popeyes sounds like / is a great dining experience:	Male	139	3.16
	Female	**144**	3.21

			One-sided p	Two-sided p
Popeyes - I am a regular at Popeyes:	Equal variances assumed	-.568	.285	.570
	Equal variances not assumed	-.570	.285	.569
Popeyes - Offers a quick meal:	Equal variances assumed	-1.400	.081	.163
	Equal variances not assumed	-1.397	.082	.163
Popeyes - Offers an inexpensive meal:	Equal variances assumed	.388	.349	.699
	Equal variances not assumed	.387	.350	.699
Popeyes - Offers a pleasant dining experience:	Equal variances assumed	-.724	.235	.470
	Equal variances not assumed	-.722	.235	.471
Popeyes - Menu offers a good variety of options:	Equal variances assumed	.770	.221	.442
	Equal variances not assumed	.769	.221	.442

Popeyes - Offers quick service in the drive-thru line:	Equal variances assumed	-1.085	.139	.279
	Equal variances not assumed	-1.084	.140	.279
Popeyes - Offers healthy options:	Equal variances assumed	-1.897	.029	.059
	Equal variances not assumed	-1.894	.030	.059
Popeyes - Is in an easily accessible location:	Equal variances assumed	1.037	.150	.301
	Equal variances not assumed	1.036	.151	.301
Popeyes - Overall, Popeyes sounds like / is a great dining experience:	Equal variances assumed	-.439	.330	.661
	Equal variances not assumed	-.439	.330	.661

The following variables showed no significant difference between Males and Females:
• Popeyes - I am a regular at Popeyes
• Popeyes - Offers a quick meal
• Popeyes - Offers an inexpensive meal
• Popeyes - Offers a pleasant dining experience
• Popeyes - Menu offers a good variety of options
• Popeyes - Offers quick service in the drive-thru line
• Popeyes - Is in an easily accessible location
• Popeyes - Overall, Popeyes sounds like / is a great dining experience
The following variables showed significantly higher means for Females:
• Popeyes - Offers healthy options
Managerial Conclusion: There is no statistical difference between males and females in terms of: I am a regular at Popeyes, offers a quick meal, offers an inexpensive meal, offers a pleasant dining experience, menu offers a good variety of options, offers quick service in the drive-thru line, is in an easily accessible location, overall, Popeyes sounds like/is a great dining experience. There is a significantly higher mean for females in terms of the variable "offers healthy options." This means that Popeyes could benefit from asking female patrons what kind of food options they could add to make the menu more healthy.

Hypothesis Tests: Independent Samples T-Tests: Gender

Q10 - I would prefer for Chick-fil-A to be open 7 days a week.	Male	137	3.28
	Female	144	3.57
Q10 - I like the Chick-fil-A rewards system.	Male	137	3.84
	Female	144	4.03
Q10 - I think Chick-fil-A should add a value option on the menu.	Male	137	3.96
	Female	144	4.03

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Q10 - I would prefer for Chick-fil-A to be open 7 days a week.	Equal variances assumed	-1.787	.037	.075
	Equal variances not assumed	-1.784	.038	.075
Q10 - I like the Chick-fil-A rewards system.	Equal variances assumed	-1.602	.055	.110
	Equal variances not assumed	-1.601	.055	.110
Q10 - I think Chick-fil-A should add a value option on the menu.	Equal variances assumed	-.551	.291	.582
	Equal variances not assumed	-.550	.292	.583

The following variables showed no significant difference between Males and Females:
- I like the Chick-fil-A rewards system.
- I think Chick-fil-A should add a value option on the menu.

The following variables showed significantly higher means for Females:
- I would prefer for Chick-fil-A to be open 7 days a week.

Managerial Conclusion: There is no statistical difference between males and females in terms of: I like the Chick-fil-A rewards system, and I think Chick-fil-A should add a value option on the menu. There is a significantly higher mean for females in terms of the variable, "I would prefer for Chick-fil-A to be open 7 days a week." This means Chick-Fil-A could benefit from asking female patrons why they would want Chick-Fil-A open seven days a week.

Chi-Squared Tests

| | | | Race Recoded | | |
			Black/African American	White/ Caucasian	Total
I would prefer for Chick-fil-A to be open 7 days a week.	Strongly Disagree	Count	10	17	27
		% within- I would prefer for Chick-fil-A to be open 7 days a week.	37.0%	63.0%	100.0%
		% within Race Recoded	7.2%	13.3%	10.2%
	Disagree	Count	17	26	43
		% within- I would prefer for Chick-fil-A to be open 7 days a week.	39.5%	60.5%	100.0%
		% within Race Recoded	12.3%	20.3%	16.2%
	Neither Agree nor Disagree	Count	31	19	50
		% within- I would prefer for Chick-fil-A to be open 7 days a week.	62.0%	38.0%	100.0%
		% within Race Recoded	22.5%	14.8%	18.8%
	Agree	Count	44	24	68
		% within- I would prefer for Chick-fil-A to be open 7 days a week.	64.7%	35.3%	100.0%
		% within Race Recoded	31.9%	18.8%	25.6%
	Strongly Agree	Count	36	42	78
		% within- I would prefer for Chick-fil-A to be open 7 days a week.	46.2%	53.8%	100.0%
		% within Race Recoded	26.1%	32.8%	29.3%
Total		Count	138	128	266
		% within - I would prefer for Chick-fil-A to be open 7 days a week.	51.9%	48.1%	100.0%
		% within Race Recoded	100.0%	100.0%	100.0%

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.564[a]	4	.014
Likelihood Ratio	12.698	4	.013
Linear-by-Linear Association	1.459	1	.227
N of Valid Cases	266		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.99.

Chi Squared Tests

The Chi-Squared value shows that this relationship is significant at the 0.014 level. Approximately 51.6% percent of Caucasians agree or strongly agree that Chick-fil-A should be open 7 days a week, while approximately 58% percent of African Americans do. Correspondingly, about 19.5% percent of African Americans disagree or strongly disagree that Chick-fil-A should be open 7 days

a week, while approximately 33.6% percent of Caucasians do. Chick-fil-A should consider opening Chick-fil-A 7 days a week in areas where there are more African Americans than Caucasians in order to bring more of this demographic in.

| | | | Race Recoded | | |
			Black/African American	White/Caucasian	Total
I Prefer: - 1	Strongly Prefer Chick-fil-A	Count	44	66	11
		% within I Prefer: - 1	40.0%	60.0%	100.0%
		% within Race Recoded	34.6%	57.9%	45.6%
	Prefer Chick-fil-A	Count	33	29	62
		% within I Prefer: - 1	53.2%	46.8%	100.0%
		% within Race Recoded	26.0%	25.4%	25.7%
	Neutral	Count	24	9	33
		% within I Prefer: - 1	72.7%	27.3%	100.0%
		% within Race Recoded	18.9%	7.9%	13.7%
	Prefer Popeyes	Count	11	3	14
		% within I Prefer: - 1	78.6%	21.4%	100.0%
		% within Race Recoded	8.7%	2.6%	5.8%
	Strongly Prefer Popeyes	Count	15	7	22
		% within I Prefer: - 1	68.2%	31.8%	100.0%
		% within Race Recoded	11.8%	6.1%	9.1%
Total		Count	127	114	241
		% within I Prefer: - 1	52.7%	47.3%	100.0%
		% within Race Recoded	100.0%	100.0%	100.0%

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	18.309[a]	4	.001
Likelihood Ratio	18.898	4	<.001
Linear-by-Linear Association	14.607	1	<.001
N of Valid Cases	241		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.62.

The Chi-Squared value shows that this relationship is significant at the 0.001 level. Approximately 83.3% percent of Caucasians prefer or strongly prefer Chick-fil-A over Popeyes, while approximately 59.2% percent of African Americans do. Correspondingly, about 20.5% percent of African Americans prefer or strongly prefer Popeyes over Chick-fil-A, while approximately 8.7% percent of Caucasians do. Clearly, there is a difference between the races on their specific restaurant preferences.

Correlations

Correlations

		Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:	Chick-fil-A - I am a regular at Chick-fil-A:	Chick-fil-A - Offers a quick meal:	Chick-fil-A - Offers an inexpensive meal:	Chick-fil-A - Offers a pleasant dining experience:	Chick-fil-A - Menu offers a good variety of options:	Chick-fil-A - Offers quick service in the drive-thru line:	Chick-fil-A - Offers healthy options:	Chick-fil-A - Is in an easily accessible location:	Q10 - I would prefer for Chick-fil-A to be open 7 days a week.	Q10 - I like the Chick-fil-A rewards system.	Q10 - I think Chick-fil-A should add a value option on the menu.
Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience:	Pearson Correlation	1	.487	.590	.365	.722	.525	.581	.589	.604	.240	.422	.168
Chick-fil-A - I am a regular at Chick-fil-A:	Pearson Correlation	.487	1	.447	.334	.417	.333	.260	.353	.363	.140	.414	.041
Chick-fil-A - Offers a quick meal:	Pearson Correlation	.590	.447	1	.380	.586	.453	.583	.424	.495	.313	.439	.292
Chick-fil-A - Offers an inexpensive meal:	Pearson Correlation	.365	.334	.380	1	.345	.334	.358	.323	.358	.141	.264	-.014
Chick-fil-A - Offers a pleasant dining experience:	Pearson Correlation	.722	.417	.586	.345	1	.526	.519	.476	.514	.223	.408	.161
Chick-fil-A - Menu offers a good variety of options:	Pearson Correlation	.525	.333	.453	.334	.528	1	.418	.473	.453	.223	.327	.119
Chick-fil-A - Offers quick service in the drive-thru line:	Pearson Correlation	.581	.260	.583	.358	.519	.418	1	.483	.544	.217	.323	.201
Chick-fil-A - Offers healthy options:	Pearson Correlation	.589	.353	.424	.323	.476	.473	.483	1	.580	.159	.364	.094
Chick-fil-A - Is in an easily accessible location:	Pearson Correlation	.604	.363	.495	.358	.514	.453	.544	.580	1	.222	.403	.101
Q10 - I would prefer for Chick-fil-A to be open 7 days a week.	Pearson Correlation	.240	.140	.313	.141	.223	.223	.217	.159	.222	1	.342	.370
Q10 - I like the Chick-fil-A rewards system.	Pearson Correlation	.422	.414	.439	.264	.408	.327	.323	.364	.403	.342	1	.360
Q10 - I think Chick-fil-A should add a value option on the menu.	Pearson Correlation	.168	.041	.292	-.014	.161	.119	.201	.094	.101	.370	.360	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Comments

The first row on the table represents the correlation coefficients between the "Overall dining Experience at Chick-fil-A" and multiple other variables. This meets expectations, as it shows that people who come to Chick-fil-A enjoy the dining experience and often come back. Almost all of the variables show a significant relationship with Overall Experience; this is positive because a regression done with this variable as the dependent variable will have many candidate variables that may impact it.

There are many significant correlations among the planned independent variables that are not desirable and may lead to a potential problem of multicollinearity in a regression analysis, which in turn leads to spurious relationships being indicated. This is due to the "Halo Effect," which is a bias that influences people's opinions based on a single characteristic. The rest of the table also shows many significant relationships between the variables. When it comes to Chick-fil-A being in an accessible location and a customer being a regular at Chick-Fil-A, the team expected there to be some significance between the two, as it is believed that Chick-fil-A being in an accessible location would have an effect on how often people visit; the team was proven to be correct. Surprisingly, there was no shown significance between people wanting a value option added to the Chick-fil-A menu and Chick-fil-A offering an inexpensive meal. To minimize the effect of

multicollinearity, the team will use stepwise regressions which will not allow insignificant variables to come into the chosen steps of the regression.

Managerial Implications: Based on the data, there is a correlation between Chick-fil-A offering an inexpensive meal and the "Overall Dining Experience" at Chick-Fil-A. This helps improve customers' overall dining experience at Chick-fil-A. Unfortunately, there is not a strong correlation between Chick-fil-A offering an inexpensive meal and people wanting a value option added to the Chick-fil-A menu. These two variables do not share much of a linear relationship, even though it was assumed that they would. This will be good to note when the team uses "Chick-fil-A offers an inexpensive meal" as the dependent variable in this regression analysis.

		Popeyes - Overall, Popeyes sounds like / is a great dining experience:	Popeyes - I am a regular at Popeyes:	Popeyes - Offers a quick meal:	Popeyes - Offers an inexpensive meal:	Popeyes - Offers a pleasant dining experience:	Popeyes - Menu offers a good variety of options:	Popeyes - Offers quick service in the drive-thru line:	Popeyes - Offers healthy options:	Popeyes - Is in an easily accessible location:
Popeyes - Overall, Popeyes sounds like / is a great dining experience:	Pearson Correlation	1	.483"	.401"	.339"	.678"	.522"	.457"	.379"	.537"
Popeyes - I am a regular at Popeyes:	Pearson Correlation	.483"	1	.226"	.157"	.400"	.440"	.267"	.288"	.287"
Popeyes - Offers a quick meal:	Pearson Correlation	.401"	.226"	1	.536"	.391"	.274"	.537"	.213"	.488"
Popeyes - Offers an inexpensive meal:	Pearson Correlation	.339"	.157"	.536"	1	.459"	.305"	.421"	.249"	.364"
Popeyes - Offers a pleasant dining experience:	Pearson Correlation	.678"	.400"	.391"	.459"	1	.568"	.490"	.483"	.351"
Popeyes - Menu offers a good variety of options:	Pearson Correlation	.522"	.440"	.274"	.305"	.568"	1	.388"	.340"	.337"
Popeyes - Offers quick service in the drive-thru line:	Pearson Correlation	.457"	.267"	.537"	.421"	.490"	.388"	1	.349"	.398"
Popeyes - Offers healthy options:	Pearson Correlation	.379"	.288"	.213"	.249"	.483"	.340"	.349"	1	.131'
Popeyes - Is in an easily accessible location:	Pearson Correlation	.537"	.287"	.488"	.364"	.351"	.337"	.398"	.131'	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The first row on the table represents the correlation coefficient between " Popeyes being a great dining experience" and multiple other variables. This meets expectations because it shows that people are enjoying their dining experience at Popeyes and are continuously visiting. Almost all the variables show a significant relationship with "Overall dining experience" at Popeyes; this is a positive note, as a regression done with this variable as the dependent variable will have many candidate variables that may impact it. The rest of the table also shows many other significant relationships between the variables. The team was surprised to see a correlation between "Popeyes is in an easily accessible location" and "Popeyes offers healthy options," as one would not typically think that Popeyes being in an accessible location had any correlation with Popeyes offering healthy options, but it still showed significance.

This is due to the "Halo Effect" which is a bias that influences people's opinions based on a single characteristic. These many significant correlations among the planned independent variables are not desirable and may lead to a potential problem of multicollinearity in a regression analysis, which in turn leads to spurious relationships being indicated. To minimize the effect of multicollinearity, the team used stepwise regressions which will not allow insignificant variables to come into the chosen steps of the regression.

Managerial Implications: Based on the data, there is a correlation between people being regular customers at Popeyes and their "Overall Dining Experience." This may be explained by the idea that customers perceive their dining experience at Popeyes as being positive will tend to return and consider themselves as "regulars." All the coefficients show a strong relationship to "Overall Satisfaction."

Regression Analysis

Dependent Variable: Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
5	.753[e]	.568	.560	.582

• **Predictors**: (Constant), Chick-fil-A - Is in an easily accessible location; Chick-fil-A offers a quick meal; Chick-fil-A - Offers healthy options; Chick-fil-A - Menu offers a good variety of options; Chick-fil-A - Offers quick service in the drive-thru line

• In this regression, the team has successfully explained 56% of the variance in the dependent variable "Overall Satisfaction."

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
5	Regression	128.684	5	25.737	75.860	<.001[f]
	Residual	98.048	289	.339		
	Total	226.732	294			

• **Predictors**: (Constant), Chick-fil-A - Is in an easily accessible location; Chick-fil-A - Offers a quick meal; Chick-fil-A - Offers healthy options; Chick-fil-A - Menu offers a good variety of options; Chick-fil-A - Offers quick service in the drive-thru line

• Based on the ANOVA, the regression as a whole demonstrates a linear relationship between the variables, significant at the 0.001 level

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
5	(Constant)	.437	.197		2.219	.027
	Chick-fil-A - Is in an easily accessible location:	.204	.051	.208	3.998	<.001
	Chick-fil-A - Offers a quick meal:	.232	.052	.226	4.462	<.001
	Chick-fil-A - Offers healthy options:	.193	.043	.222	4.447	<.001
	Chick-fil-A - Menu offers a good variety of options:	.142	.041	.163	3.493	<.001
	Chick-fil-A - Offers quick service in the drive-thru line:	.153	.050	.160	3.077	.002

• **Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience** = 0.226 * Offers a quick meal + 0.222 * Offers healthy options + 0.208 * Easily accessible location + 0.163 * Offers a good variety of options + 0.160 * Offers quick service in the drive-thru

- **Managerial Conclusions**: Management should be focusing on these variables in the following order: offering a quick meal, offering healthy options, being in an accessible location, offering a good variety of options and having quick service in the drive-thru line.

Regression Analysis

Dependent Variable: Popeyes - Overall, Popeyes sounds like/ is a great dining experience

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
4	.680[d]	.463	.455	.713

- **Predictors**: (Constant), Popeyes - Is in an easily accessible location; Popeyes - Menu offers a good variety of options; Popeyes - Offers healthy options; Popeyes - Offers quick service in the drive-thru line
- In this regression, the team has successfully explained 45.5% of the variance in the dependent variable "Overall satisfaction."

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
4	Regression	127.362	4	31.841	62.623	<.001[e]
	Residual	147.959	291	.508		
	Total	275.321	295			

- **Predictors**: (Constant), Popeyes - Is in an easily accessible location; Popeyes - Menu offers a good variety of options; Popeyes - Offers healthy options; Popeyes - Offers quick service in the drive-thru line
- Based on the ANOVA, the regression as a whole demonstrates a linear relationship between the variables, significant at the 0.001 level

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
	(Constant)	.270	.186		1.447	.149
	Popeyes - Is in an easily accessible location:	.345	.046	.361	7.552	<.001
	Popeyes - Menu offers a good variety of options:	.273	.047	.283	5.783	<.001
	Popeyes - Offers healthy options:	.190	.049	.182	3.887	<.001
	Popeyes - Offers quick service in the drive-thru line:	.124	.045	.138	2.737	.007

- **Popeyes - Overall, Popeyes sounds like / is a great dining experience** = 0.361 * Easily accessible location + 0.283 * Offers a good variety + 0.182 * Offers healthy options + 0.138 * Offers quick service in the drive-thru
- **Managerial Conclusions**: The manager should be focusing on these variables in this order: offering a good variety of options, offering healthy options, and having quick service in the drive-thru line.

Conclusion

This business research project on Chick-fil-A has provided important insights into the opinions, preferences, and satisfaction levels of the respondents questioned. The team was able to obtain a myriad of data by creating and carrying out a detailed survey. This allowed the team the opportunity to examine crucial aspects of Chick-fil-A's business practices, customer support, and overall brand perception. The data was subsequently analyzed to identify patterns, trends, and opportunities for progress. This has helped to clarify the elements that contribute to Chick-fil-A's success, as well as potential improvement areas. In addition to deepening the comprehension of Chick-fil-A's market positioning, this research provides a solid basis for future studies and strategic suggestions in the field of fast-food industry research.

The pie charts provide a visual representation of the exact areas in which Chick-fil-A is exceeding and where they need to improve.

- Areas in which Chick-fil-A is excelling:
- **Chick-fil-A offers a quick meal**: 87.92% agree or strongly agree; mean of 4.17.
- **Chick-fil-A offers a pleasant dining experience**: 79% either agree or strongly agree; mean of 4.05.
- **Chick-fil-A offers quick service in the drive-thru line**: 84.56% of respondents agree or strongly agree; mean of 4.21.
- **Chick-fil-A is in an easily accessible area**: 83% of respondents either agree or strongly agree; mean of 4.08.
- **Chick-fil-A is a great dining experience**: 83.66% of respondents agree or strongly agree; mean of 4.15.
- Areas in which Chick-fil-A needs improvement:
- **Chick-fil-A offers an inexpensive meal**: 41.28% of respondents either agree or strongly agree; mean of 3.22.
- **Chick-fil-A's menu offers a variety of options**: 66.12% of respondents either agree or strongly agree; mean of 3.77.
- **Chick-fil-A offers healthy options**: 69.76% of respondents agree or strongly agree; mean of 3.79.
- **I am a regular at Chick-fil-A**: 50.17% of the respondents agree or strongly agree; mean of 3.31.

After looking further into this study's respondents, the team found that this survey was representative of the Georgia population in terms of gender. This was discovered based on this test of one proportion.

- Females had a higher set of means for the following topics:
- Chick-fil-A - Offers a pleasant dining experience
- Chick-fil-A - Offers healthy options

- Chick-fil-A - Is in an easily accessible location
- Popeyes - Offers healthy options
- I would prefer for Chick-fil-A to be open 7 days a week.

For the rest of the two mean questions, the team found that there were no significant differences between males and females.

The test of one proportion between Blacks/African Americans and Caucasians was not representative of the population of Georgia. Although this is a limitation that the team discovered during this analysis, the following was found for this specific sample:

- Blacks/African Americans had a higher set of means for the following topics:
- Preference for Drive-Through rather than Sit-Down: With family
- Preference for Drive-Through rather than Sit-Down: On a date
- Popeyes - Overall, Popeyes sounds like / is a great dining experience
- Popeyes - Is in an easily accessible location
- Popeyes - Menu offers a good variety of options
- Popeyes - Offers a pleasant dining experience
- Popeyes - I am a regular at Popeyes
- Caucasians had a higher set of means for the following topics:
- Chick-fil-A - Offers quick service in the drive-thru line
- Chick-fil-A - Offers a pleasant dining experience
- Chick-fil-A - Offers a quick meal
- I like the Chick-fil-A rewards system.

For the rest of the two mean questions, the team found that there were no significant differences between Blacks/African Americans and Caucasians.

Looking at the bar charts, one can see that respondents score Chick-fil-A's practices much higher than Popeyes. The first bar chart shows the Likert scale means for Chick-fil-A.

- Chick-fil-A - Offers an inexpensive meal: **3.22**
- Chick-fil-A - I am a regular at Chick-fil-A: **3.31**
- Chick-fil-A - Menu offers a good variety of options: **3.72**
- Chick-fil-A - Offers healthy options: **3.79**
- Chick-fil-A - Offers a pleasant dining experience: **4.05**
- Chick-fil-A - Is in an easily accessible location: **4.08**
- Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience: **4.15**
- Chick-fil-A - Offers a quick meal: **4.17**
- Chick-fil-A - Offers quick service in the drive-thru line: **4.21**

The second bar chart shows the Likert scale means for Popeyes.

- Popeyes - I am a regular at Popeyes: **2.17**
- Popeyes - Offers healthy options: **2.28**
- Popeyes - Offers a pleasant dining experience: **3.00**
- Popeyes - Offers quick service in the drive-thru line: **3.11**
- Popeyes - Menu offers a good variety of options: **3.15**
- Popeyes - Overall, Popeyes sounds like / is a great dining experience: **3.15**
- Popeyes - Offers a quick meal: **3.33**
- Popeyes - Offers an inexpensive meal: **3.34**
- Popeyes - Is in an easily accessible location: **3.47**

Based on bar charts, it is evident that means for the Likert scales are very different. All means for Chick-fil-A lie between 3.22 and 4.21. Offers a pleasant dining experience, Is in an easily

accessible location, Chick-fil-A sounds like/is a great dining experience, Offers a quick meal, and Offers quick service in the drive-thru line all lie above the 4.0 mark. None of the Popeyes' means lie above the 4.0 mark. For Popeyes, Offers a pleasant dining experience, Offers quick service in the drive-thru line, Menu offers a good variety of options, Popeyes sounds like/is a great dining experience, Offers a quick meal, Offers an inexpensive meal, Is in an easily accessible location are all between the 3.0 and 3.47 mark.

For the first Chi-Square analysis, the team took a deeper look at the topics "I would prefer for Chick-fil-A to be open 7 days a week" and "I prefer [Chick-fil-A or Popeyes]" between African American and Caucasian respondents. It is important to note that the team had to essentially recode the SPSS data to only draw conclusions from African American and Caucasian samples, and to consciously disregard any other gender options for only this section of the report. There is a clear racial segmentation for the following:

•	I prefer-

By looking deeper into this topic, the team saw that 83.3% of Caucasians preferred Chick-fil-A over Popeyes. Only 52.9% of African American prefer Chick-fil-A over Popeyes. On the opposite end of the spectrum, 20.5% of African Americans prefer Popeyes over Chick-fil-A, and 8.7% of Caucasian prefer Popeyes over Chick-fil-A.

The correlation and regression tests were based on how independent variables were related back to the dependent variable. Below are the regression equations that tests resulted in:

•	**Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience** $= 0.226 *$ Offers a quick meal $+ 0.222 *$ Offers healthy options $+ 0.208 *$ Easily accessible location $+0 .163 *$ Offers a good variety of options $+ 0.160 *$ Offers quick service in the drive-thru

•	**Popeyes - Overall, Popeyes sounds like / is a great dining experience =** $0.361 *$ Easily accessible location $+ 0.283 *$ Offers a good variety $+ 0.182 *$ Offers healthy options $+ 0.138 *$ Offers quick service in the drive-thru

These conclusions have allowed the team to see the exact points that Chick-fil-A needs to improve on, on what points they are exceeding, and a better understanding of who their customer segments are and what is important to them. The team believes that Chick-fil-A can use the provided managerial recommendations to attract new segments of customers, improve their current image, and overall become a better functioning establishment.

Recommendations

A survey was conducted to examine the correlation between consumers' perceptions of Popeyes and Chick-fil-A as dining establishments. The results obtained by Chick-fil-A indicated that, in the majority of the managerial conclusions, customers prefer Chick-fil-A over Popeyes.

Following an examination of the survey data, it was determined that approximately 60% of Chick-fil-A's clientele holds the opinion that the restaurant offers a more extensive menu selection in comparison to Popeyes. Although Chick-fil-A provides a diverse selection of menu items, the advises the restaurant to consider implementing a value menu as a strategic move to expand their clientele. This will generate interest by facilitating an expansion of the company's market presence. In this survey, the team asked whether individuals would prefer Chick-fil-A to operate 7 days a week. Roughly 52% of the participants responded favorably to this inquiry. The team advises Chick-fil-A to contemplate conducting Sunday operations. Regardless of the corporation's final decision, the team kindly suggests that they contemplate the possibility of operating with modified hours. Sunday hours for Chick-fil-A could be extended from 1:00 pm to 8:00 pm; this would generate additional revenue and increase sales. Being a fast food establishment that is notably

founded on Christian principles, Chick-fil-A might consider operating for a restricted duration, perhaps opening at the end of the church day. This modification has the potential to provide the restaurant with a chance to enhance profitability and satisfy patrons while still upholding the organization's core principles.

The team concluded, based on this research, that the majority of respondents are in agreement or neither concur nor disagree with the statement that Chick-fil-A offers inexpensive meals, with the average cost of a meal per visit is approximately $14. It is advisable to extend discounts exclusively to specific customer segments, including healthcare personnel, first responders, and college students. Alternatively, consider basing promotions on the performances of statewide sports organizations, such as the Georgia Bulldogs, Atlanta Braves, or Atlanta Hawks. This will increase the number of visitors, thereby generating additional revenue.

Additionally, Chick-fil-A should devote more time to educating patrons about the advantages of the rewards program. Respondents seem to appreciate the reward system; therefore, more individuals could benefit from the abundance Chick-fil-A provides if more consumers were mindful of the application. Guests will enjoy using the application because it simplifies the order process and provides opportunities to earn complimentary meals in exchange for their loyalty.

Based on the results of the Chi-Squared test, the team recommends discussing being open 7-days a week. Being closed Sunday is a very important principle for many, but for growing the business, it will help bring in more revenue. The other Chi-Squared test shows that 83.3% percent of Caucasians prefer or strongly prefer Chick-fil-A over Popeyes, while approximately 59.2% percent of African Americans do. The team recommends working on a great dining experience, an easily accessible location, and a variety of menu options. Improving those categories will help increase African Americans preference to Chick-fil-A over Popeyes. The findings in the correlations show Chick-fil-A is strong in all categories.

The regression analysis shows exactly which independent variables have the greatest effect on the dependent variable, the overall dining experience at either establishment. The final regression equation is important for Chick-fil-a to understand, as it expresses just how much weight each attribute carries.

• **Chick-fil-A - Overall, Chick-fil-A sounds like / is a great dining experience** = 0.226 * Offers a quick meal + 0.222 * Offers healthy options + 0.208 * Easily accessible location + 0.163 * Offers a good variety of options + 0.160 * Offers quick service in the drive-thru

• **Popeyes - Overall, Popeyes sounds like / is a great dining experience =** 0.361 * Easily accessible location + 0.283 * Offers a good variety + 0.182 * Offers healthy options + 0.138 * Offers quick service in the drive-thru

Overall, Chick-fil-A is doing a wonderful job at carrying out its operations and offering its customers a wonderful dining experience. By having a better understanding of customer perceptions between Chick-fil-A and Popeyes, valuable insight can be gained. The team urges Chick-fil-A to use this valuable research to their advantage. The team believes that increasing their number of operating days, adding a value menu option, and improving African American customer perceptions will further the already great experience of dining at a Chick-fil-A.

Limitations
• Relative lack of secondary sources.
• The survey was not based on a random sample.
• The team did not procure a minimum of 385 respondents.
• The sample is only representative of Georgia residents.

-      The sample is not representative of race in terms of the Georgia population.

Explanation of #1:

When doing research, it is crucial to seek work and resources from outside perspectives. Using secondary sources when conducting research has many advantages, such as "answer certain research questions and test some hypotheses, formulate an appropriate research design (e.g., identify key variables), interpret data from primary research as it can provide some insights into general trends in an industry or product category, and understand the competitive landscape" (Mora, 2022). The team did not incorporate as much secondary research as it would have liked due to the time constraint for completing this project.

Explanation of #2

The survey was not based on a random sample. Because the questionnaire was sent to friends, family, acquaintances, and other West Georgia students, the team procured responses from a *convenience sample*. This is included as a limitation, as this sample may not be representative of the population. Unfortunately, this may lead to a sampling bias.

Explanation of #3

Due to the time constraints on this research project, the team was unable to procure 385 usable responses. 385 was the target, as this would allow the team to have a larger sample to examine trends and form recommendations about. Although over 400 people opened the survey, they would often not complete the survey to its entirety. In total, there were approximately 318 usable responses to generate conclusions and recommendations about.

Explanation of #4

As mentioned earlier, these conclusions were drawn from a convenience sample. All the responses came from Georgia residents. Chick-fil-A and Popeyes are located across the United States, so only having responses from Georgia residents does not allow managers to see a full scope of opinions nationally. Therefore, the team is generalizing findings based on a sample of Georgia residents. This limited the team from coming to conclusions about Chick-fil-A and Popeyes for all U.S. residents.

Explanation of #5

Based on hypothesis tests of race, the team concluded that this sample was not representative of the number of Caucasians in Georgia. This, once again, relates back to the fact that this sample was based on convenience. Were the team to have procured a true random sample, the data collected could have shown a more representative set of data in terms of race.

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Appendix
Questionnaire
<u>Disclaimer</u>
This survey will be used for a research project for MKTG- 3808. We, the students, are using this questionnaire to draw conclusions about this targeted company. Please note that this survey is anonymous. Your name will not be recorded and your individual responses are not disclosed. If any aspect of this survey is bothersome, you may decline to answer that/those question(s). Thank you.

Q1. Race:
• Black/African American
• White/ Caucasian
• Hispanic
• American Indian/ Alaskan Native
• Asian/ Pacific Islander
• Other

Q2. Gender:
• Male
• Female
• Non-binary
• Prefer not to say

Q3. On average, how many times a week do you visit Chick-fil-A? (Please enter a whole number)

Q4. On average, approximately how much do you spend each time you visit Chick-fil-A? (Please enter a whole number, without the dollar sign.)

Q5. I would choose to visit a restaurant with a drive-through like Chick-fil-A or Popeyes, over a sit down meal like Olive Garden of Jeffersons if I am:

	Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
With family:					
Eating alone:					
With college friends:					
On a date:					

Q6.1. Have you ever eaten at Chick-fil-A?

No	
Yes	

Q6.2 Have you ever eaten at Popeyes?

No	
Yes	

Answer the questions below the best you can, even if you answered no to the previous two.

Q7.1 I am a regular at Chick-fil-A

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q7.2 Chick-fil-A offers a quick meal:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q7.3 Chick-fil-A offers an inexpensive meal:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q7.4 Chick-fil-A offers a pleasant dining experience:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q7.5 Chick-fil-A's menu offers a good variety of options:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q7.6 Chick-fil-A offers quick service in the drive-thru line:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q7.7 Chick-fil-A offers healthy options:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q7.8 Chick-fil-A is in an easily accessible location:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q7.9 Overall, Chick-fil-A sounds like/is a great dining experience:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q8.1 I am a regular at Popeyes:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q8.2 Popeyes offers a quick meal:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q8.3 Popeyes offers an inexpensive meal:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q8.4 Popeyes offers a pleasant dining experience:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q8.5 Popeyes' menu offers a good variety of options:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q8.6 Popeyes offers quick service in the drive-thru line:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q8.7 Popeyes offers healthy options:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q8.8 Popeyes is in an easily accessible location:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q8.10 Overall, Popeyes sounds like/is a great dining experience:

Strongly Agree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Q9. I prefer:

Strongly Prefer Chick-fil-A	Prefer Chick-fil-A	Neutral	Prefer Popeyes	Strongly Prefer Popeyes

Q10.

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
I would prefer for Chick-fil-A to be open 7 days a week					
I like Chick-fil-A's rewards system					
I think Chick-fil-A should add a value option on the menu					

SELECTED ANALYSIS OF GVMC (GREATER VISAKHAPATNAM MUNICIPAL CORPORATION) ANDHRA PRADESH, INDIA, ECONOMIC VARIABLES DURING 2010-11 AND 2022-23

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Prof. Vani Kotcherlakota**

ABSTRACT

The main objective of the paper is to present a selected analysis of GVMC (Greater Visakhapatnam Municipal Corporation), economic indicators in Andhra Pradesh, India for the period 2010-11 and 2022-23. The data has been obtained from Census of India, GVMC different departments data and other published sources. The methodology used in the paper is simple description of the variables and exponential growth rates. The main conclusion from the analysis is that GVMC has shown considerable progress in all the sectors.

Key Words: Greater Visakhapatnam Municipal Corporation (GVMC), Urbanization, GVA for Agriculture & Allied sectors, Industrial sector, Service sector, Budget estimates, revenue, health, education, employment, investment, exports, Finance Commission, IT related services, water supply, Special Economic Zones.

Introduction:

In this paper the emphasis is on 'Greater Visakhapatnam Municipal Corporation' (GVMC). According to Wikipedia GVMC is the civic body that governs the city of Visakhapatnam, largest city of the Indian state of Andhra Pradesh (A.P). Its jurisdiction encompasses an area of 681.96 Km^2 (263.31 sq mi). It is also part of the planning body of the Visakhapatnam Metropolitan Region Development Authority established in the year 1979, the executive power of the GVMC is vested in the Municipal Commissioner, an Indian Administrative Service officer appointed by the Government of Andhra Pradesh.

The main objective of the paper is to present a selected analysis of GVMC economic indicators in Andhra Pradesh, India for the period 2010-11 and 2022-23. Visakhapatnam, rightly called the 'City of Destiny', is a major industrial centre in the state of Andhra Pradesh. Several industrial units in the public and private sectors are located in Visakhapatnam. These include Port and Shipping, Oil Refinery, Steel, Fertilizer and Heavy Engineering to name a few. The city has strong industrial base, productive workforce and peaceful industrial relations. The city boasts of low cost, high quality social infrastructure, medical, educational, residential and recreational that match the best available anywhere in the country.

Regarding data base, on GVMC information is collected from Census of India data, GVMC different departments data, Office of the Directorate of economics and statistics, government of A.P. Vijayawada, Office of the Development commissioner, Visakhapatnam Special Economic Zone (VSEZ), and other published sources. It is presented in simple bi-variate Tables and percentages and averages wherever necessary. The methodology used in the paper is simple description of the variables and exponential growth rate. We have used Exponential growth formula to estimate 2021 population for GVMC:

$P_t = P_o e^{rt}$, Where P_t: Population at time t, P_o: Population at the initial time period, r: rate of growth, t: time period from initial time point.

$P_{2011} = P_{2001} e^{10r}$, $e^{10r} = P_{2011}/P_{2001}$, $10r \log_e^e = \log_e (P_{2011}/P_{2001})$, $10r.1 = \ln(P_{2011}/P_{2001})$,

$r = 1/10 \ln (P_{2011}/P_{2001})$, $P_{2021} = P_{2011} e^{10r} = P_{2011}. \text{Exp}(10r)$

The paper is presented in four sections. In the first section which is presented in two parts consists of (1) the evolution and in the second part definition of urbanization. In the section 2 the emphasis is on performance of selected sectors of GVMC broad sectors Agriculture, industry and service sectors' Gross Value Added (GVA). Budget estimates and revenue resources of GVMC are presented in two parts in the third section respectively. The fourth section deals with an analysis of health indicators, education, Finance Commission funds to GVMC, I.T and I.T related services, service sector through tourism and water supply.

Section 1 is discussed in two parts. In the first part the evolution of Greater Visakhapatnam Municipal Corporation (GVMC). Whereas the second part is devoted to definition of urbanization.

1.1 Evolution of Greater Visakhapatnam Municipal corporation:

Visakhapatnam once a small fishing village. It was upgraded as a Municipality in the year 1866. In the year 1979 it was upgraded to Visakhapatnam Municipal Corporation (VMC). A further upgrade occurred to Greater Visakhapatnam Municipal Corporation (GVMC) in the year 2005 with merging of Gajuwaka and 32 Villages. Further Anakapalli Municipality with 5 Grama Panchayats and Bheemili Municipality were added in August 2013 and Bheemili 5 Grama Panchayats were added in December 2019. No. of Election Divisions: As a consequence of these upgrades, the VMC-50 population of 8.00 lakhs and sq.Kms 111.00, has increased to Sq.Kms 533.00,with the inclusion of Gajuwaka Municipality and 32 Grama Panchayats (2005) Extent in No. of Election Divisions: 72,and population increased from 14.35 lakhs (2001 Census) to 17.30 lakhs (2011 Census). At

present with the addition Anakapalli and Bheemili Municipality and 10 Grama Panchayats, the area is Sq.Kms 620, population is 18.83 lakhs (2011 Census).The number of Election Divisions with this change increased from 72 to 98 wards. GVMC is divided by 8 zones and each had a Zonal Commissioner. GVMC zones are (1) Bheemunipatnam (2) Madhurawada (3) Asilmeetta (4) Suryabagh (5) Gnanapuram (6) Gajuwaka (7) Anakapalli (8) vepagunta (See Map-1).

MAP-1
GREATER VISAKHAPATNAM MUNICIPAL CORPORATION
CITY MAP SHOWING ZONES AND WARDS
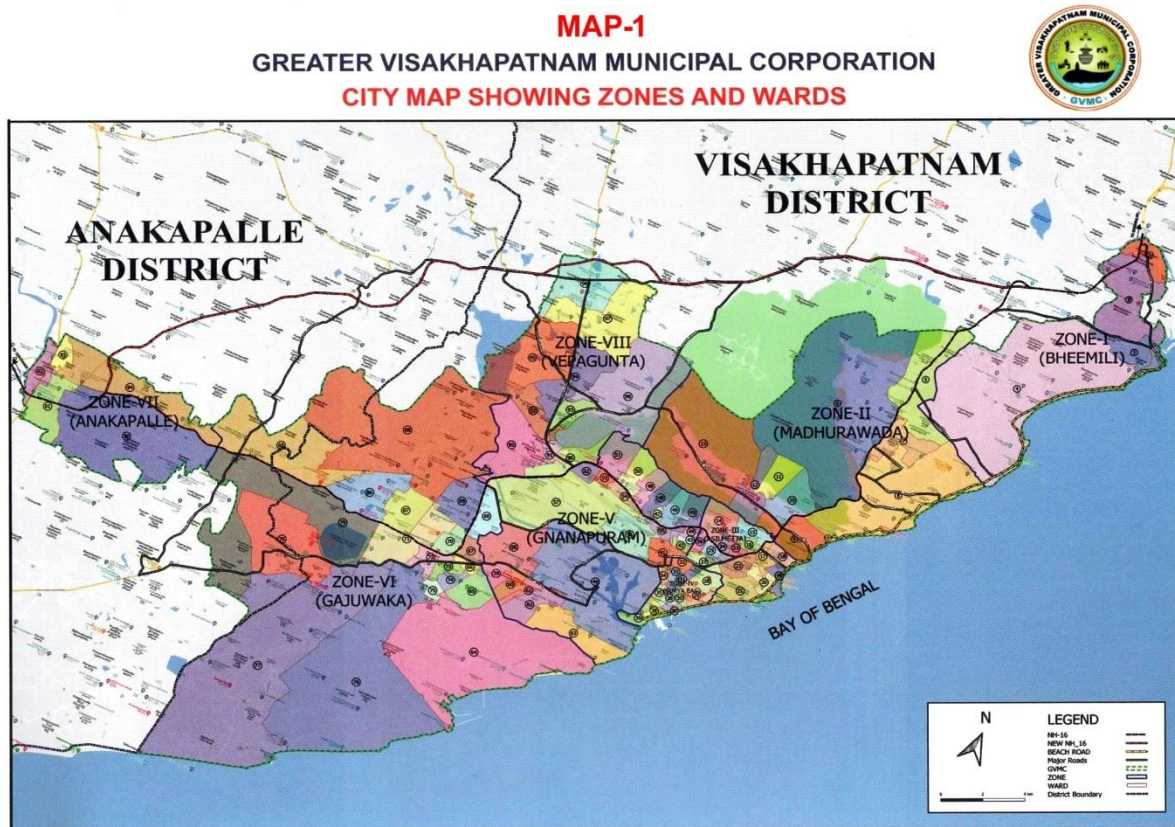
Source: GVMC Budget Estimates 2022-23, Revised Budget Estimates 2021-22, Corporation Resolution No.: 271/2022 dated: 04-03-2022, cover page.

1.2 Urbanization Definition:

The requirement for urbanization as per Census data are:(1) The villages or panchayats, a minimum expected population of 5000 (2) A minimum expected population density of 400 persons per square kilometre (3) At least 75 per cent of the male working population should be engaged in non-farm pursuits. Census towns or non-statutory towns, town with a population of 100 thousand and above is generally is referred as city.

Table 1.1 shows population and Size Class

Population	Size Class
1 lakh and above	1
50,000 – 99,999	11
20,000 – 49,999	111
10,000 – 19,999	1V
Below 5000	V

151

1.2.1 Visakhapatnam Urban Agglomeration Population and decadal Variation between 1901 and 2011

The decadal population growth rates for Visakhapatnam agglomeration during the past century shows (Table-1.2) that there is a steady increase in absolute number of urban populations in Visakhapatnam city. There is a big leap of increase during 1981-91decade which shows an increase of nearly 4.5 lakh. In the later centaury the rate of increase has declined considerably but there was an addition of nearly 3 lakhs in 2001 urban agglomeration over 1991 Census. According to 2011 Census nearly 3 lakhs and 85 thousand added over 2001 Census.

Table1.2: Visakha Urban Agglomeration Population in 2011 with variation since 1901.

	Year	Total	Decadal Variation	% Decadal Variation	Male	Female
Visakhapatnam	1901	40,892			20,034	20,858
	1911	43,413	+2,521	+6.17	21,465	21,948
	1921	44,711	+1,298	+2.99	22,153	22,558
	1931	57,303	+12,592	+28.16	29,449	27,854
	1941	70,243	+12,940	+2258	35,660	34,583
	1951	108,042	+103,148	+95.47	110,545	100,645
	1961	211,190	+103,148	+95.47	110,545	100,645
	1971	363,467	+152,277	+72.10	189,084	174,383
	1981	603,630	+240,163	+66.08	312,224	291,406
	1991	10,51,918	+448,288	+74.13	542,742	509,176
	2001	13,45,938	+294,020	+27.32	687,985	657,953
	2011	17,30,320	+384,328	+28.56	875,199	855,121
	2021	22,24,476	+ 4,94,156	+ 77.78	11,25,144	10,99,332

Source: 2011 Census of India, Provisional Population Totals, Paper 2, Vol. 1 of 2011, data on rural and urban areas Andhra Pradesh series 29.

In addition, it may be noted, that there are 98 wards in GVMC after adding Anakapalli and Bheemili Municipality and 10 Grama Panchayats the total population varies from a high of ward 28 Visakhapatnam East (23,127) to a low of ward 11 Visakhapatnam East of constitution (16,995). The Table also depicts the projected growth from 2011 to 2021 and is observed that the growth is by 4.94 lakhs.

Section 2- Performance of Selected Variables of GVMC:

In this section the Tables for certain sectors are presented to depict the performance in 2014-15 and 2019-20. The choice of the period is dictated by the availability of data. GVMC Gross Domestic Product is the value of the economic value of all goods and services produced within the geographical boundaries of the GVMC; and counted without duplication during a specified period of time, usually a year. GDP = Gross Value Added (GVA) + Product taxes -product subsidies. GVA = Gross Value of output (GVO) – Input – FISIM (Financial subsidies inter mediation Services

Indirectly Measured.)

This GVMC Gross Domestic Product[1]reflects the economic and financial health of the GVMC, Per Capita Incomes of the people, to compare inter corporate corporations, to capture structural changes in the GVMC economy, for devolution of funds from Finance Commission, rate of capital formation and rate of saving etc.

Broad and sub sectors in GDP: **(1) <u>Agriculture and Allied Sectors</u>: A)** Agriculture: Production for major crops and other crops **B) Horticulture:** Production for major crops and other crops C**) Fishing:** a) Marine fish b) inland fish c) penaid prawn d) non-penaid Prawn e) fresh water prawn d) brackish water prawn production D**) <u>Livestock</u>:** a) Milk production, Animal meat production b) Bovine population (cattle Buffalo population), c) Wool production, d) egg production, poultry population, cocoons production, honey production E**) Forestry and Logging**: a)Major Forest Produce b) Minor forest produce, c) fodder d) Trees outside forest (TOF) e) fuel wood (**2) <u>Industrial Sectors</u>: (A) Electricity, Gas, Water supply, remediation and other utility services:** a) Electricity b) GAS (Natural) c) Gobar gas d) Water supply e) Remediation and other utility services (B**) Construction:** construction (C) **Manufacturing** a) organized (NDEs+Pvt. Corp) b) unorganised (D) **Mining and quarrying**: **Major Minerals** a) petroleum and Natural Gas b) limestone c) Manganese Ore e) others **Minor minerals including sand** a) road metal b) black granite c) gravel and morrum d) colour granite e) others mineral wise production **(3) <u>Service Sectors</u>: (A)** Railway (Supra Regional **:** a) Railways b) communication c) Banking and insurance) (B)**Transport & Storage:** a) Road transport b) water transport c) Air transport d) services incidental to transport e) Storage and ware housing C) **Trade and repair services, Hotels and Restaurants:** a) trade and repair services b) Hotels and restaurants   D) **Real estate and Ownership of dwellings:** Real estate, ownership of dwellings a) Rural and Urban b)Urban **E) Banking F) Communication G) Public administration:14) Other services:** a) Education, b) Health c) Remaining other services.

The importance of grass root level planning at district/ sub region/GVMC level is increasing day by day. Preparation of district Regional/GVMC and state levels has gained importance over the years to achieve balanced regional development and GVMC GDP estimate is one of the core indicators. The Andhra Pradesh is a fore runner in the preparation of DDP/GDP as per the CSO guidelines. The estimates provide information on the economic status of the districts in a state/District/GVMC and the performance of different sectors across the regions.

<u>Agriculture sector:</u> From Table 2.1 There is no agriculture contribution either for agriculture or for horticulture from urban areas. However, for fishing and livestock urban areas are higher than rural. Further the performance for forestry and logging rural contribution is more both in 2014-15 and 2019-20.

* 1. Office of the Directorate of Economics and Statistics, Government of Andhra Pradesh, Vijayawada.

GVMC Sector Wise Agriculture and Allied sectors GVA for 2014-15 and 2019-20 (Current Prices) (Rs. In Lakhs)
Table 2.1: Agriculture and Allied Sectors-GVA for 2014-15 2019-20 (Current Prices) (Rs. In Lakhs)

GVMC Name of the Mandal	Agriculture GVA		Horticulture GVA		Fishing GVA		Livestock GVA		Forestry & Logging GVA		Total Agriculture and allied sector	
	2014-15	2019-20	2014-15	2019-20	2014-15	2019-20	2014-15	2019-20	2014-15	2019-20	2014-15	2019-20
Visakhapatnam (Rural)	29	27	733	959	353	292	2048	6080	210	18371	3374	25730
Visakhapatnam (Urban)	0	0	0	0	53859	98613	2028	6653	185	301	56072	105568
Total	29	27	733	959	54,212	98905	4076	12733	395	18672	59,446	131298

Source: Office of the Directorate of Economics and Statistics, Government of Andhra Pradesh, Vijayawada.

GVMC Industrial sectors GVA for 2014-15 and 2019-20 (Current Prices) (Rs. In Lakhs)
Table2.2: Industrial Sectors-GVA for 2014-15 2019-20 (Current Prices) (Rs. In Lakhs)

GVMC Name of the Mandal	Electricity, Gas, Water & Remediation GVA		construction GVA		Manufacturing GVA		Mining & Quarrying GVA		Total GVA	
	2014-15	2019-20	2014-15	2019-20	2014-15	2019-20	2014-15	2019-20	2014-15	2019-20
Visakhapatnam (Rural)	4881	37219	31045	43034	25690	32579	116	0	61732	112832
Visakhapatnam (Urban)	21684	108432	115726	160416	187479	270794	0	0	324889	539642
Total	26565	145651	146771	203450	213169	303373	116	0	386621	652474

Source: Office of the Directorate of Economics and Statistics, Government of Andhra Pradesh, Vijayawada.

Note1: Mines and Geology includes: Road Metal, Gravel and Marram, Colour Granite

Industrial sector: For industry from Table 2.2 it is observed that for Electricity and Gas, Construction and manufacturing the values are higher for urban in both the periods. However, for Mining and quarrying the performance is negligible for rural and urban and for both periods.

Table2.3: Service Sector-GVA for 2014-15 and 2019-20 (Current Prices) (Rs. In Lakhs)

GVMC Name of the Mandal	Railway GVA		Transport & Storage GVA		Trade GVA		Real Estate & Ownership Dwelling GVA		Banking GVA		Communication		Public Administration		Other services		Total GVA	
	2014-2015	2019-2020	2014-2015	2019-2020	2014-2015	2019-2020	2014-2015	2019-2020	2014-2015	2019-2020	2014-2015	2019-2020	2014-2015	2019-2020	2014-2015	2019-2020	2014-2015	2019-2020
Visakhapatnam (Rural)	1211	4440	29641	55782	56771	142585	47504	64111	31892	58262	2598	10709	2056	3986	23956	49989	195629	389864
Visakhapatnam (Urban)	68468	94622	155395	309343	353844	1705546	204017	283041	161766	332509	68868	39920	138892	324966	100235	197793	1251485	3287740
Total	69679	99062	185036	365125	410615	1848130	251521	347151	193658	390770	71466	50629	140948	328952	124191	247781	1447114	3677600
GVMC three Sectors Agriculture+ Industrial+ Service sectors put together Grand Total (2014-15) (Rs. In lakhs)																	Rs. In lakhs. 59,446+3,86,621+14,47,114=18,93,181	
GVMC three Sectors Agriculture+ Industrial+ Service sectors put together Grand Total (2019-20) (Rs. In Lakhs)																	Rs. In lakhs. 1,31,298+6,52,474+36,77,600=44,61,372	

Source: Office of the Directorate of Economics and Statistics, Government of Andhra Pradesh, Vijayawada.

Service Sector: Table 2.3 depicts the performance of the service sector for 2014-15 and 2019-20. In the above Table as expected the values are consistently higher than rural for both the periods. However, for both rural and urban areas there is consistent increasing trend for 2014-15 and 2019-20 is observed.

Section 3: This section is discussed in two parts. The first part refers to budget estimates and the second part is devoted to Revenues are presented:

In first part 3.1 the GVMC consolidated details on Budget estimates for 2011-2012 and 2022-23 are presented for comparative analysis.

Table3.1.1: GVMC Consolidated details on Budget Estimates 2011-12 and 2022-23 (Rs. In Lakhs)

		2011-12	2022-23
1	Opening Balance	15113.38	43480.15
2	Receipts under all Heads	196535.00	388518.00
3	Total receipts including opening balance	211648.98	431998.15
4	Expenditure under all heads	199788.35	406190.00
5	Closing Balance	11860.63	25808.15

Source:GVMC Budget 2011-12, date: 09-12-2010, page. 1
GVMC Budget 2022-23, date: 04-03-2022 Page. 8.

In second Part 3.2 Revenue resources of GVMC:

The following are the income sources for the corporation from the Central and State Governments.

Revenue from taxes:

A) **Following is the Tax related revenue for the corporation.**
(a) Property tax (b) Profession tax (c) Entertainment tax (d) grants from Central and State Government like goods and services tax (e) Advertisement tax.

B) **Following is the non-Tax related revenue for the corporation**
(a) Water usage charges (b) Fees from Documentation services (c) rent received from municipal property. (d) Funds from municipal bonds.

Table3.1.2: GVMC Revised budget estimates- abstract, for the years 2010-11 and 2021-22 (Rs. In Lakhs)

Head Description	RECEIPTS						EXPENDITURE					
	Revenue		Capital		Total		Revenue		Capital		Total	
Period	2010-11	2021-22	2010-11	2021-22	2010-11	2021-22	2010-11	2021-22	2010-11	2021-22	2010-11	2021-22
Opening Balance					16143.91	63917.15						
General administration	46107.20	80952.00	1100.00	3300.00	47207.20	84252.00	3324.00	11302.00	4040.00	6750.00	7364.00	18052.00
Engineering	1606.00	5961.00	375.00	33139.00	1981.00	39100.00	7369.50	30026.00	14087.00	56670.00	21456.50	86696.00
Lighting	11.50	0.00	0.00	0.00	11.50	0.00	2260.55	12373.00	795.00	30800.00	3055.55	15453.00
Projects	153.00	0.00	100.00	17200.00	253.00	17200.00	524.50	790.00	489.00	29620.00	1013.50	30410.00
Town Planning	7488.50	26604.00	1075.00	0.00	8563.50	26604.00	353.75	1092.00	2360.00	2600.00	2713.75	3692.00
U.C.D Project	5.50	0.00	3210.00	51835.00	3215.50	51835.00	891.00	1374.00	3210.00	51835.00	4101.00	53209.00
Education	1820.00	1550.00	70.00	550.00	1890.00	2100.00	3625.00	1592.00	3270.00	745.00	6895.00	2337.00
Parks, Leisure and Cemeteries	0.00	0.00	0.00	2500.00	0.00	2500.00	301.00	5360.00	205.00	5600.00	506.00	10960.00
Public Health	450.00	11137.00	1500.00	4300.00	1950.00	15437.00	9734.50	36259.00	2050.00	4380.00	11784.50	40639.00
Water Supply	12158.00	38130.00	1180.00	12430.00	13338.00	50560.00	8227.50	22024.00	2986.00	6130.00	11213.50	28154.00
A Total	**69799.70**	**164334.00**	**8610.00**	**125254.00**	**78409.70**	**289588.00**	**36611.30**	**122192.00**	**33492.00**	**167410.00**	**70103.30**	**289602.00**
JNNURM	**0.00**	0.00	79341.57	0.00	79341.57	0.00	0.00	0.00	89259.00	3460.00	89259.00	3460.00
Rajiv Awas Yojana	**0.00**	0.00	3000.00	300.00	3000.00	300.00	0.00	0.00	3000.00	300.00	3000.00	300.00
AMRUT		0.00		2400.00		2400.00		0.00		10500.00	--	10500.00
External Aided Projects	--	0.00	--	16674.00	--	16674.00	--	0.00		16674.00	--	16674.00
Finance Commission Funds	**0.00**	0.00	1300.00	14600.00	1300.00	14600.00	0.00	0.00	1300.00	24900.00	1300.00	24900.00
B Total	**0.00**	**0.00**	**83641.57**	**33974.00**	**83641.57**	**33974.00**	**0.00**	**0.00**	**93559**	**55834.00**	**93559.00**	**55834.00**
Deposits and Advances	**611.50**	13.00	15024.00	31777.00	15635.50	31790.00	2086.50	131.00	12968.50	30222.00	15055.00	30353.00
C Total	**611.50**	**13.00**	**15024.00**	**31777.00**	**15635.50**	**31790.00**	**2086.50**	**131.00**	**12968.50**	**30222.00**	**15055.00**	**30353.00**
A+B+C Grand Total	**70411.20**	**164347.00**	**107275.57**	**191005.00**	**177686.77**	**355352.00**	**38697.80**	**122323.00**	**140019.50**	**253466.00**	**178717.30**	**375789.00**
Total, Including Opening Balance					193830.68	419269.15						
Closing Balance											15113.38	43480.15

Analysis of Table3.1.2 (Rs. In Lakhs)

Year	Receipts		Expenditure	
	2010-11	**2021-22**	**2010-11**	**2021-22**
A Total	78409.70	289588.00	70103.30	289602.00
B. Total	83641.57	33974.00	93559.00	55834.00
C.Total	15635.50	31790.00	15055.00	30353.00
A+B+C Grand Total	**177686.77**	**355352.00**	**178717.30**	**375789.00**

The above Table depicts the data from Table 3.1.2

Section 4: in this section the focus is on the analysis of health indicators, education and Finance Commission Funds for GVMC. Further IT related services and water supply also are analyzed.

Table 4.1:Performance of Health Indicators in India, A.P and GVMC during 2010-12 and 2022

Indicator	India (SRS 2012)	India (SRS 2022)	AP (SRS 2012)	A P (SRS 2022)	Visakhapatnam District (SRS 2012)	Visakhapatnam District (SRS 2022)	GVMC (SRS2012)	GVMC (SRS Sep 2022)
IMR	**42**	**30**	**41**	**11**	43 per 1000 live Births	**21**	**33**	**21**
MMR	**178**	**97**	**110**	**59**	137 per one Lakh Live Births	**105**	**104**	**96**
Institutional Deliveries	**85.3%**	**88.6%**	**93.0%**	**99.98%**	80.3%	**99.99%**	**100%**	**99.99%**

Source:(1)   HIMS (Health Management Information Systems: Commissioner of Health and Family

Welfare), Vijayawada.

(2)   Sample Registration System (SRS) General of India (RGI) for the year 2012 and 2019
(3)   Special Bulletin on MMR released by the Registrar General of India
(4)   National FamilyHealthSurvey 5 (NFHS-5)

From Table-4.1 the following observations are made. As per the Sample Registration System (SRS) Bulletin of Registrar General of India (RGI) (1) IMR and MMR decreased from 2012 to 2022 for India, A.P, Visakhapatnam District and GVMC.

(2) Institutional delivers depicted increases for India, A.P and more for Visakhapatnam District and the same for GVMC.

4.2 Education: As for education data details, much information was not available. Future works will focus on this aspect.

Table4.2.1:Greater Visakhapatnam Municipal Corporation (GVMC) Schools and Students Details:

S.NO.	*ULB*	*Category of the School*	*No. of Schools*
1	GVMC	Primary Schools	115
		Upper Primary Schools	5
		High Schools	27
		Total No. Schools	**147**

Table 4.2.2: Enrolment of Students in GVMC

	Boys	**Girls**	**Total**
1	14025	13898	27923
Total	**14025**	**13898**	**27923**

Source: School Education Department GVMC December, 2022

4.3. Finance Commission Funds to GVMC:

Table 4.3.1: Finance Commission Capital Receipts during 2009-10 and 2020-21(Rs. In Lakhs)

Head Description	2009-10 Actuals	2020-21 Actuals
Grants, contribution for specific purposes	13th Finance Commission Funds	1300.00
14th Finance commission Grants	0.00	5825.22
15th Finance commission Grants	0.00	7300.00
Grand Total	0.00	13125.22

Source: **Greater Visakhapatnam Municipal Corporation, Budget 2022-23, p.105**
Greater Visakhapatnam Municipal Corporation Budget 2011-12 PP. 129

Table 4.3.2: Finance Commission Capital Expenditure during 2009-10 and 2020-21(Rs. In Lakhs)

Head Description	2009-10 Actuals	2020-21 Actuals
Grants, contribution for specific purposes	13th Finance Commission Funds	1300.00
14th Finance commission Grant works	0.00	438.46
15th Finance commission Grant works	0.00	0.00
Total	0.00	438.46

Source: Greater Visakhapatnam Municipal Corporation, Budget 2022-23, p.105, Greater Visakhapatnam Municipal Corporation Budget 2011-12 PP. 130

Table4.3.3: Finance Commission Funds Abstract during 2009-10 and 2020-21 (Rs. In Lakhs)

Head Description	2009-10 (Actuals) and 2011-12	2020-21(Actuals)
Capital Receipts	1300.00	13125.22
Total Receipts	1300.00	13125.22

Capital Expenditure	1300.00		438.46			
Total Expenditure	1300.00		438.46			

All the Tables 4.3.1, 4.3.2, and 4.3.3 depicted the fact that finances increased considerably from 2009-10 to 2020-21. This reflects the financial health of GVMC.

4.4 IT and IT related Services: The modes planned to push the growth of service sector through IT are

Table 4.4.1 Sector wise breakup of Employment and Investment from SEZs as on 31st December'2022 (2022-23) of VSEZ, Duvvada, and Exports During 2018-19 to 2021-22

Sector	Employment (in numbers)	Investment (Rs.in Crore)	Exports from VSEZs			
			2018-19	**2019-20**	**2020-21**	**2021-22**
Biotech	224	380.48	0.00	0.00	0.00	0.00
Computer/Electronic software	684	25.91	34.12	42.02	38.09	34.91
Electronics	77	107.22	5.13	8.21	21.11	112.56
Engineering	159	23.69	122.95	70.12	89.96	140.01
Gems and Jewellery	954	6.44	39.40	103.62	147.30	86.71
Chemicals and Pharmaceuticals (Crude Petroleum Refinery)	1259	856.74	1377.61	1005.86	1484.40	1625.09
Handicrafts	90	1.86	0.00	0.00	0.00	0.00
Food and Agro Industry	4	0.40	0.00	0.00	0.00	0.00
Trading and service	86	12.10	110.17	21.12	43.47	67.74
Textiles and garments	7	0.70	0.00	0.00	0.00	0.00
Misc.	377	210.58	327.61	390.71	99.21	**70.96**
Total	**3921**	**1626.12**	**2016.99**	**1641.66**	**1923.54**	**2137.99**

The above Table is self explanatory. Visakhapatnam Special Economic zone (VSEZ) has shown considerable growth from 2018-19 to 2021-22, for Biotech, Computer/Electronic software, electronics. In other cases there are fluctuations and also it may be noted that COVID impact is observed by the decline in all categories from 2018-19 to 2020-21.

VSEZ, formerly known as VEPZ, was established in the year 1989. Set up in a sprawling 360 acres of prime land in one of the fastest growing cities of India, Visakhapatnam Special Economic Zone

offers state of the art infrastructure coupled with liberal package of incentives, concessions and support services. The export-friendly administrative set up ensures disposal of all approvals and clearances instantly.

The administrative head of the Visakhapatnam Special Economic Zone is the Development commissioner. He is also the Zonal Head for all Special Economic Zones and Export Oriented Unites in the states of Andhra Pradesh, Telangana, Chhattisgarh and Yanam (Union Territory).

4.5 Service Sector Through Tourism:

Visakhapatnam is developing as a national and international tourism hub because of its natural advantages of having good natural beach, Aruku valley, Borra caves, etc.

The following are the projects to make this happen in the coming few years.

Tourism projects include world class 18-hole golf course by River Bay Group, sea plane project by turbo Aviation Ltd, and ocean swimming pool and club by swarnamukhi, local Asha of sun Group signed up to develop a tourism university.

FIA grade 3 racing track by Hayak Racing Pvt. Ltd. Promoted by Ranbir Sarkar of Hyderabad is coming up near Bhogapuram in Vizianagarm. The project is extimated to cost Rs. 900 crore.

MOU for Tunnel aquarium project with an estimated cost of Rs. 100 crore was signed by NRI TSN Raju and his Turkish partner Safak Guzin with the A.P government.

The Eye of Vizag (mega wheel) project MOU was signed by US-based NRI Hari Damera and his Russian partner Vladimir.

The tourism Department said AP has potential for water tourism recreation and adventure tourism, eco-tourism, beach and water tourism rural tourism, heritage tourism, cuisine tourism, wellness tourism and temple tourism. As expected, the tourism sector attracted investors from across the country as well abroad.

Oberoi group signed an MOU to establish Luxury Villa resorts at Bheemili in Vizag city, Tirupati, Gamdikota, Horsely Hills and Pichukalanka.

Taj group signed an MOU to develop Luxury resorts worth Rs. 700 crore in Vizag city

4.6 Greater Visakhapatnam Municipal Corporation Water Supply:

i)   Demography and other details:

- The population of the city is estimated at 22.97 lakhs with in area about 681.96 Sq.Kms and is divided into 8 distribution zones to ensure uniform distribution of water.

- The water supply distribution zones are broadly:1) Zone 1 Bhimili, 2) Central City (Zones – II III & V), 3) Old City (Zone -IV) 4) Gajuwaka (Zone – VI), 6) 32 Peripheral areas covering, Pendurthi&Madhuruwada, Anakapalli (Zone VII)

ii)   Sources of supply, treatment and other details:

- There are about seven sources (Yelleru/Godavari, Raiwada, Tatipudi, MGR, Gosthani, Ghambiram and Mudasarilova) which supply about 395.5 MLD (87MGD) water to the city for both domestic and industrial usages. The distances of sources ranges from 10Km. to 156 Km.The Table 4.6.1 shows that the water levels of different reservoirs are encouraging to maintain the present water supply of the GVMC even in summer also without much problems, except minor issues that results due to power tripping, pipe line bursts etc.,

Table 4.6.1: The water levels of different reservoirs of the GVMC

Name of the Source	Water drawls (In MLD)	Max Level	Min level
Yeleru/Godavari	193.65	86.56mts	72.54mts
Raiwada	68.19	114.00	99.00mts
Thatipudi	45.46	297'.00''	251'.00''
MehadriGedda	36.36	61'.0''	44'.00''
Gosthani (infiltration wells)	22.73	35'.0''	21'.6''
Gambheeram (Seasonal)	2.273	126'.0''	107'.0''
Mudasarlova	2.273	169'.0''	152'.0''

Source: TSR Complex GVMC water supply office December 2022

In the Table 4.6.1 out of the Yeleru/Goadavari source is the major one, which is an open canal running in a length of 156Km. that supply about 204.57 MLD (45 MGD) and caters to 60 per cent of the GVMC water demand. In addition, there are about 236 PWS schemes which are predominantly in the merged areas and also 8766 hand borewells that supplement the supply. Eleven treatment plants with a capacity of 489 MLD (107.46 MGD) exists for treating the Raw Water. Per capita supply on average is about 105 to 110 LPCD against the standard of 135 LPCD and duration is about to 45 min to 60 min daily once.

Conclusions: The main conclusion from the analysis is that GVMC has shown considerable progress in all the areas during the past decade. The different sectors have shown good growth and nominal GVA, finance, health, education, I.T sector, and I.T related services from VSEZ have performed well. Based

on the analysis the **suggestion** is that economic growth of the GVMC has to grow ideally in double digit continuously for longer years. To achieve this GVMC has to prepare action plan by coordinating with all the concerned departments and increasing the productivity from the existing projects.

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