

LEWIS

Undergraduate
Research Journal

RESEARCH

VOL.

18

WINTER

Lucerna Undergraduate Research Journal

Volume 18

A publication by
The Honors Program of
The University of Missouri-Kansas City

2023-2024

Publication Date: March 14, 2024

Copyright © 2024 The Editors of *Lucerna*
ISSN 2691-0284 (Print)
ISSN 2691-0365 (Online)

Table of Contents

Letter from the Editor.....	6
Editorial Board.....	8
Staff.....	9

Social Sciences

Regulation in the Cryptocurrency Industry Maha Mateen.....	11
---	----

Science, Technology, Engineering, and Mathematics (STEM)

<i>Fomes fomentarius</i> : A Sustainable Plastic Alternative? Alijah Henderson.....	30
The Spanish Inquisition and its Impact on Mathematics in Spain during the Seventeenth Century: A translation of excerpts from J. Zaragoza's Trigonometría Española Rye Ledford.....	49

Humanities

The Problem with International Social Contracts Catherine Abbott.....	73
As Seen on TV: The Effects of Pharmaceutical Advertising on the Doctor- Patient Relationship Ashlesha Bhojane.....	88
Kansas City, Missouri Climate Change Indications: An Analysis of Climate Data Between 1973 and 2023 Nico Bradshaw.....	106
YouTube's Flat-Earth Discourse Community Caitlyn Davis.....	118

“Barbara’s Way or the Highway”: An Analysis of Barbara Grier and Her Involvement with <i>The Ladder</i> , 1957-1972 Kale Marie Michael.....	128
Denazification of West Germany, 1945-1950: US Disappointment and Justifications Emma Nowotny.....	139
Queens of Punk Rock: The Impact of The Slits, Dolores O’Riordan, and Kirsty MacColl on the Subgenre Lauren Textor.....	159
Author Biographies.....	168

Letter From the Editor

Welcome to the eighteenth volume of *Lucerna*! This journal presents the unique and remarkable research of undergraduates at the University of Missouri-Kansas City and is produced annually by the Honors Program. Since its debut in 2006, *Lucerna* has showcased the scholarship of 164 students. With the publication of this volume, we also celebrate the hard work of the *Lucerna* staff, Honors Program student reviewers, faculty advisors, and mentors.

I have been involved with *Lucerna* since 2022, when I began as managing editor under Anuhya Dayal (Editor-in-Chief 2022), whose organizational skills, guidance, and kindness set me up for success. I am grateful for her leadership last year. I would also like to thank Dr. Henrietta Rix Wood, *Lucerna's* faculty advisor, whose passion for publication, writing, and research is inspiring. As she prepares for retirement, I am honored to recognize her commitment to *Lucerna* over the past seven years. Finally, I would like to thank Dr. Gayle Levy, Honors Program Director, and Margo Gamache, Honors Program Director of Student Affairs, for their support in the production of *Lucerna*.

We have made great strides in the return to normalcy following the COVID-19 pandemic. In-person staff meetings have fully returned, and we even hosted our first in-person *Lucerna* symposium since 2020 on March 23, 2023. The excitement was evident as six authors presented their incredible research, and we had an insightful question-and-answer session. I look forward to maintaining this energy for our 2024 symposium on March 14.

This year, we further committed ourselves to the organization of the journal based on three disciplines: Humanities, Social Sciences, and Science, Technology, Engineering, and Mathematics (STEM). We focused our efforts on updates and further development of the individualized rubrics for each discipline used in our review process. I am excited that this will further show *Lucerna's* dedication to providing a fair selection process and encourage an even higher caliber of writing. I thank Managing Editor Theo Raitzer for his work on these rubrics.

Another focus this year was ramping up publicity. I would like to thank Marisa McKay for her work starting and running the new *Lucerna*

Instagram page (be sure to follow @umkclucerna!). I would also like to recognize Olivia Carlson for her work with publicity, including encouraging students to speak in classes, tabling events, and emailing professors.

The beautiful volume you are reading reflects the commitment of *Lucerna's* senior editors and Marketing and Design Co-Supervisor, Anna Shaw, who aided Professor Zach Frazier and the students of Ether Design Lab. Together, they skillfully compiled the essays and spent countless hours on the layout. I am grateful for their knowledge and assistance.

Ultimately, *Lucerna's* role is to encourage interdisciplinary research. As you enjoy volume eighteen, be sure to note the range of topics, from exploring a lesbian writer through the lens of the co-cultural communication theory to the discussion of fungi as a plastic alternative. I commend the contributors for their commitment to their research, to making this journal possible, and to inspiring fellow researchers. I wish them all the best in their future endeavors and look forward to seeing where *Lucerna* goes!

Sincerely,

Lauren Ferguson

2023 *Lucerna* Editor-in-Chief

Editorial Board

Editor-in-Chief: Lauren Ferguson

Lauren Ferguson (she/her) is a senior majoring in environmental studies and literature and languages with a Spanish emphasis. This is Lauren's second year with *Lucerna*, and she is also a member of the Spanish Honors Discussion Group and the treasurer for the Mercury Association of Professional Communication. After graduation, she is interested in working on environmental policy and waste management.

Managing Editor: Theo Raitzer

Theo Raitzer (he/him) is a junior in the BA/MA economics program. He began working for *Lucerna* as a reviewer a year ago. Theo also is involved in the Economics Club and other organizations at UMKC. His research interests include Post-Keynesian economic policy and Modern Monetary Theory. After graduation, Theo hopes to work at the Kansas City Federal Reserve or another government organization.

Staff

Spring 2023:

Anuhya Dayal – *Editor-in-Chief*

Lauren Ferguson – *Managing Editor*

Alex Unseth – *Secretary*

Christian Dang – *Marketing & Design Coordinator*

Marisa McKay – *Public Relations Co-Supervisor*

Tinh Nim – *Public Relations Co-Supervisor*

Olivia Carlson – *Public Relations Co-Supervisor*

Gouri Kallanagowdar – *Treasurer*

Fall 2023:

Anuhya Dayal – *Senior Editor and Treasurer*

Lauren Ferguson – *Editor-in-Chief*

Theo Raitzer – *Managing Editor*

Alex Unseth – *Co-Secretary*

Tami Ayegbo – *Co-Secretary*

Grace Dang – *Marketing & Design Co-Coordinator*

Anna Shaw – *Marketing & Design Co-Coordinator*

Marisa McKay – *Public Relations Co-Supervisor*

Jillian Neeley – *Public Relations Co-Supervisor*

Olivia Carlson – *Public Relations Co-Supervisor*

Dr. Henrietta Rix Wood – *Faculty Advisor, Teaching Professor, Honors Program*

Ether Design Lab:

Professor Zach Frazier – *Faculty Advisor*

Novalee Rivera – *Layout Designer*

Lauren Markley – *Cover Designer*

Anna Shaw – *Layout Designer*

Social Sciences

Regulation in the Cryptocurrency Industry

Maha Mateen

Cryptocurrency is a controversial addition to the global payments system. It is novel, unique, and is highly volatile. Crypto allows for an alternative way of payments and rivals traditional financial institutions. The new technology allows for anonymity, transparency, and decentralization of the financial system (Woo et al., 2013). This paper will examine regulation in the cryptocurrency industry. To understand the complexities with regulation it is essential to consider the origination of cryptocurrency and blockchain technology. Crypto exchanges are responsible for facilitating the trading of cryptocurrencies. Futures Exchange (FTX) was the third largest crypto exchanges by volume, and it declared bankruptcy in November of 2022 (Reiff, 2023). Regulatory bodies around the world are working towards setting appropriate regulation in the cryptocurrency industry. With all these rapid changes in the industry, the future of cryptocurrency is still undecided. The overlapping and undefined responsibility in the crypto industry leaves gaps in regulation (Kingsley, 2022). Since there is not one entity responsible for regulation, there are many different entities taking responsibility for applicable aspects of regulation. The changing accounting standards regarding crypto assets also create confusion and frustration for crypto firms in the industry (Kharpal, 2023). In all, regulation must increase in the cryptocurrency industry.

Origin of Crypto

Cryptocurrency has taken the financial world by storm over the last decade. This currency provides a peer-to-peer transaction network that removes the need for a central clearing house or financial institution to process transactions (Woo et al., 2013). Different cryptocurrencies and cryptocurrency exchanges exist in the market space. It has developed into an industry that has begun to compete with traditional financial institutions.

Bitcoin, the first cryptocurrency, was created in January of 2009 by Satoshi Nakamoto. This name is a pseudonym, the identity of the

creator(s) of Bitcoin is unknown. Bitcoin was created in response to the Great Financial Crisis of 2008. The currency was designed to create a decentralized financial system by removing the need for financial intermediaries (Cointelegraph, 2022). Bitcoin has a finite supply, similar to gold. As of February 2023, there are approximately 19.3 million Bitcoins in circulation. The supply of Bitcoins will continue to increase until it reaches a limit of 21 million. This is estimated to occur around 2140 (Woo et al., 2013). Bitcoin uses blockchain technology, which is made up of a distributed ledger on many separate computers that is used to process and verify transactions. The first block of the Bitcoin blockchain was mined on January 3, 2009, and is referred to as the genesis block. On May 22, 2010, the first real world transaction of Bitcoin occurred when 10,000 bitcoins were exchanged for two pizzas (Cointelegraph, 2022). Currently, a single Bitcoin is worth around \$25,000. Figure 1 shows the price of Bitcoin over the past few years.

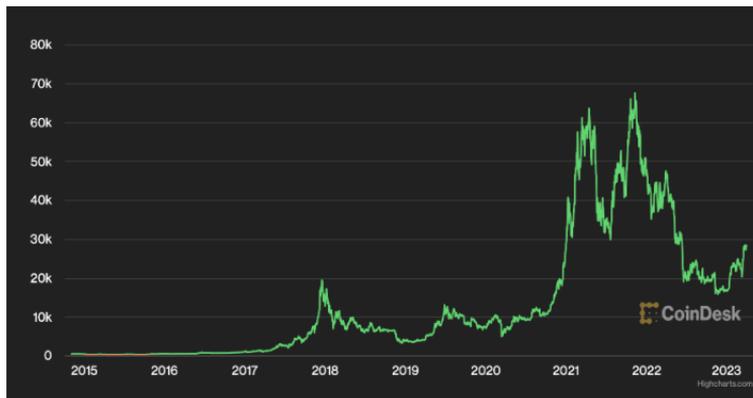


Figure 1. (CoinDesk, 2023)

Over the last decade, Ethereum, Tether, and Binance Coin have emerged as other large currencies in this space (CoinMarketCap, 2023a). The crypto industry has proven to be risky and volatile. Even though large

spikes and falls in price are common, Bitcoin has skyrocketed in popularity (Baker, 2023).

Blockchain Technology

Most cryptocurrencies use blockchain technology to process and verify their transactions. Blockchain technology uses blocks on a distributed ledger. A block is a record of transactions stored on chains, which is called the network database. When a transaction occurs, it is added to the blockchain in the database which can then be seen by all the computers on that blockchain. The transaction uses cryptography to secure the transaction. Each user has a private key, which is a highly secure password, and a public key, used to execute transactions. The user needs the public key to send and receive currency, but they also need the private key to access the currency (S, R.A, 2023). Blockchain technology decentralizes the transaction process, so it does not fit the traditional definitions set by regulators (Wanjiru, 2022). Figure 2 describes the transaction process through the blockchain.

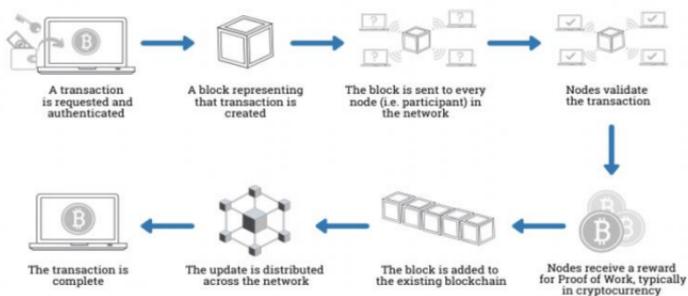


Figure 2.

(Euromoney Learning 2020)

The transactions are permanent, they cannot be reversed, and take approximately an hour to process. The transactions are verified through the process of “mining.” Miners will solve a mathematical puzzle to solve for the hash value of a block. If miners solve the mathematical puzzle correctly, they get the block reward in return (S, R.A, 2023). As of

February 2023, the block reward is set at 6.25 bitcoins (Baker, 2023). The process of mining requires very powerful computers and a significant amount of energy (S, R.A, 2023). The difficulty and complexity of mining increases when more miners join the network, which also causes energy consumption and costs to increase. There has been debate about the environmental impact of large-scale mining due to the substantial amounts of energy consumption. According to the Cambridge Bitcoin Electricity Consumption Index, Bitcoin mining consumes 121-terrawatts of energy per year, which is more than Netherlands or the Philippines (Baker, 2023). In 2022, the White House Office of Science and Technology Policy released a report calling on the Environmental Protection Agency and Department of States to develop standard for the environmental impact of the industry (Gkrtisi, 2022). Riot Blockchain, Marathon Digital Holdings, and Canaan are some of the largest mining companies in the world (Arrieche & Henn, 2023). The unique nature of blockchain technology makes it difficult to regulate.

Crypto Exchanges

With the increase in popularity of Bitcoin, many different cryptocurrencies and crypto exchanges have entered the market. There are two types of exchanges, centralized and decentralized exchanges. Centralized exchanges (CEX) are the most popular with 99 percent of all trades occurring on these platforms (SoFi, 2022). The biggest CEX's by market volume are Binance, Coinbase Exchange, and Kraken (CoinMarketCap, 2023b). Decentralized exchanges (DEX) are significantly less popular but tend to offer lower fees (SoFi, 2022). The biggest DEX's by market volume are dYdX, Uniswap (V3), and Kine Protocol (CoinMarketCap, 2023c). Both CEXs and DEXs provide users with ease of access to Bitcoins. However, both types of exchanges have been subject to scrutiny due to fraud and large-scale hacks (CFI Team, 2023).

Centralized Exchanges

Centralized exchanges (CEX) work like stock exchanges. The CEX acts as an intermediary and profits from commissions and transaction fees. CEXs are usually a better option for new investors because of their user-friendly interface. CEXs are generally reliable and provide an increased level of comfort since there is an intermediary in the

transaction. Also, investors can leverage investments by borrowing money from an exchange, like margin trading (CFI Team, 2023). Investors will use borrowed money given by CEXs to invest in crypto, like borrowing money from a broker (Fernando, 2023). CEXs have high transaction fees and increased hacking risk due to the amount of currency on their platforms (CFI Team, 2023).

Decentralized Exchanges

Decentralized exchanges (DEX) do not use an intermediary but instead use smart contracts and self-executing pieces of code. In a DEX, investors have greater control over their digital currency because there is no third party. DEXs are not as susceptible to market manipulation, they provide greater privacy to users, and are less user friendly than centralized exchanges. They are typically meant for more experienced and sophisticated users. DEXs also do not offer many options for conversion to fiat currency and may have liquidity struggles when trading volumes are low (CFI Team, 2023).

There are two types of wallets for investors: a software or hardware wallet. A software wallet, often referred to as a hot wallet, is connected to the internet and stores cryptocurrency on the internet. Hot wallets are at higher risk for hacking and fraud since they store currency on the internet. A hardware wallet, often referred to as a cold wallet, stores currency offline usually on a physical device and these wallets generally are more secure than a hot wallet (Cryptopedia Staff, 2022).

There are also custodial and noncustodial wallets. A non-custodial wallet gives the investor the private key to access the currency and a custodial wallet gives the private key to a third party (ex. a CEX) (Crypto.com, 2023). "Not your keys, not your coins" is a common warning in the crypto space. It refers to how exchanges possess the private keys to the cryptocurrency if stored on their exchanges. This means that these crypto exchanges have control over the funds, not the investor (Key, 2022). An investor may lose the ability to access their funds if an exchange fails or is subject to fraud. This could create complications in determining the ownership of the cryptocurrency. Figure 3 summarizes the two types of crypto exchanges.

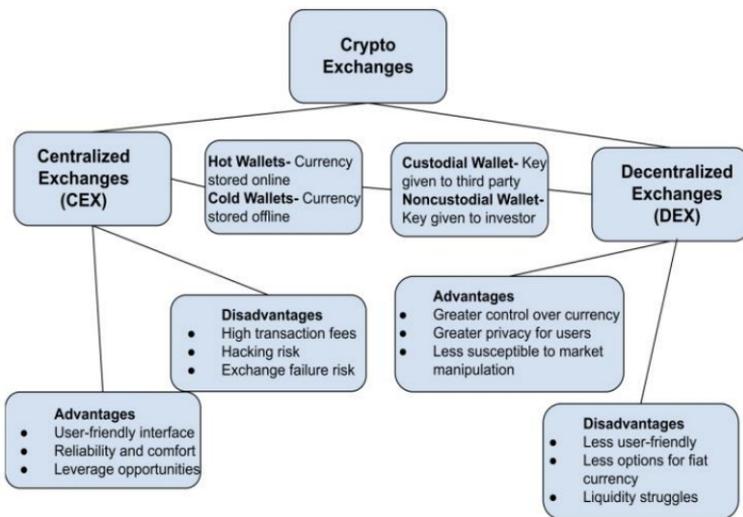


Figure 3. (CFI Team, 2023; Crypto.com, 2023; Cryptopedia Staff, 2022)

FTX Bankruptcy

Futures Exchange, better known as FTX, is a cryptocurrency exchange started by Sam Bankman-Fried in 2019 (Mack, 2023). FTX functioned as a centralized crypto exchange and became one of the biggest exchanges in the world. In all, the exchange collapsed over a 10-day period in November of 2022. On November 2, a media outlet named CoinDesk published a report revealing Alameda Research, Bankman-Fried's trading firm, had a \$5 billion position in FTT, which is FTX's native token (Reiff, 2023). A native token is the blockchain's foundational digital currency. The blockchain's design functions with its native token (Amure, 2022). Alameda Research having a large position in FTT meant that two firms with the same leadership had a large amount of money crossed over, rather than being invested in some other crypto or fiat currency. This information caused leverage and solvency concerns (Reiff, 2023). On November 6, Binance, one of FTX's competitors in the industry, announced

that it would sell its position in FTT, approximately worth \$529 million USD. On November 8, Binance announced a nonbinding agreement to buy FTX. However, the next day Binance backed out of the deal citing concerns with corporate due diligence. On November 8, Alameda Research shut down and FTX (headquartered in the Bahamas) had its assets frozen by The Securities Commission of the Bahamas (Reiff, 2023); which is responsible for regulating and overseeing digital assets (Securities Commission of the Bahamas, 2023). On November 11, FTX filed for Chapter 11 bankruptcy and Bankman-Fried stepped down as CEO and was replaced by John J. Ray III, who was also the CEO of Enron after it went bankrupt. FTX was also allegedly hacked and approximately \$477 million was stolen and reportedly invested in Ethereum (Reiff, 2023).

After filing for bankruptcy, FTX lost billions of dollars and caused a significant crash in the crypto industry. Throughout the collapse, customers demanded approximately \$8 billion in withdrawals (Mack, 2023). This reaction is similar to a run on a bank in traditional financial institutions. Celebrities and influencers who have promoted the exchange also are currently involved in lawsuits relating to the collapse. Bankman-Fried was held for a bail of \$250 million, the largest bail in history (Reiff, 2023). He pleaded not guilty to all charges against him in January 2023 (Gura, 2023).

The collapse of FTX had a ripple effect affecting other exchanges and coins in the industry. Blockfi, a crypto exchange, filed for Chapter 11 bankruptcy, in part because of its \$275 million outstanding loan to FTX. Bitcoin, Tether, and Ethereum all fell in value due to the FTX collapse (Ramirez, 2023). The Securities and Exchange Commission (SEC) charged Bankman-Fried with defrauding investors (SEC, 2022). In a press release, the SEC stated, "Defendant concealed his diversion of FTX customers' funds to crypto trading firm Alameda Research while raising more than \$1.8 billion from investors" (2022). John J Ray, FTX's new CEO, stated, "The crimes that were committed [at Enron] were highly orchestrated financial machinations by highly sophisticated people to keep transactions off balance sheets . . . (the crimes of FTX) were not sophisticated at all" (qtd in Field, 2022). Ray continued: "This is really old-fashioned embezzlement . . . This is just taking money from customers and using it for your own purpose." Ray also spoke about an "utter lack of record keeping and no

internal controls whatsoever" (qtd/ in Field, 2022). This situation shows the need for strict monitoring and regulation in the crypto industry.

Regulation

Regulatory Bodies Defining Crypto

Due to the unique nature of cryptocurrencies, there is not one regulatory body that is solely responsible for its regulation. In Forbes, Steven Ehrlich comments "crypto regulation has been difficult. This is because digital assets break the mold when it comes to traditional classifications. Ether, the native token to the multipurpose blockchain Ethereum, has or had characteristics of a commodity, currency and a security" (Ehrlich, 2023). As of now the Securities and Exchange Commission (SEC), and The Commodity Futures Trading Commission (CFTC) take on significant regulatory responsibility.

Securities and Exchange Commission

The Securities and Exchange Commission (SEC) is responsible for regulating securities and protecting investors in the US market (FSOC, 2022). Securities are defined as financial instruments that hold monetary value, like ownership in a company through stock (Kenton, 2023). There has been debate if cryptocurrency can be defined as a security since it does not satisfy the Howey Test, which was created by the US Supreme Court to determine if a financial instrument can be regulated by the SEC. To pass the Howey test and be defined as a security, the financial instrument needs to satisfy the following four characteristics under the Howey test. The instrument must:

- 1) Be an investment of money
- 2) Be in a common enterprise
- 3) Have a reasonable expectation of profits
- 4) Be derived from the effort of others

Cryptocurrency does not satisfy the fourth requirement because it is not derived from the efforts of others (Kingsley, 2022) For example, the stock of a publicly traded company is reliant upon its executives and managers to make decisions will either increase or decrease the value of the stock, therefore being derived from the effort of others (Kim, 2022). However, the SEC believes that most crypto tokens are actually still securities. SEC Chairman Gary Gensler states investors are trading crypto

because they are expecting profits derived from the efforts of others in a common enterprise (SEC, 2022). Gensler also reiterated his predecessor Jay Clayton's belief that most crypto tokens are investment contracts (and therefore securities) under the Howey Test.

Commodity Futures Trade Commission

The Commodity Futures Trade Commission (CFTC) is responsible for regulating derivatives and commodities. The CFTC asserts that cryptocurrency is a commodity, citing its primary authorizing legislation, the Commodity Exchange Act (CEA). The CFTC defines a commodity as "goods and articles, . . . and all services, rights, and interests . . . in which contracts for future delivery are presently or in the future dealt in and is not limited to solely tangible assets" (Kingsley, 2022). The CFTC and SEC differ in their classification of cryptocurrency where the former view it as a commodity and the latter as a security (Kingsley, 2022). There is ongoing debate on the classification of cryptocurrency. This has created a gray area in the industry in terms of regulation.

Internal Revenue Service

In addition, the Internal Revenue Service (IRS), which is mainly responsible for collecting taxes, classifies cryptocurrency as property, not currency (Kingsley, 2022). The IRS states that for federal tax purposes, virtual currency is treated as property and general tax principles are applicable to transactions using virtual currency. For recording gains and losses, the IRS states "If the fair market value of property received in exchange for virtual currency exceeds the taxpayer's adjusted basis of the virtual currency, the taxpayer has a taxable gain. The taxpayer has a loss if the fair market value of the property received is less than the adjusted basis of the virtual currency" (pg. 3). To determine fair value, the IRS states that transactions using virtual currency must be recorded in US dollars, (for US tax purposes) and fair market value of a cryptocurrency is determined as of date of payment or receipt (2014).

Financial Accounting Standards Board

Accounting standards also add another complication to regulation. The Generally Accepted Accounting Principles (GAAP) are the accounting standards used in the US and the International Financial

Reporting Standards (IFRS) are the accounting standards used by many other countries around the world. Currently, there is no crypto-asset specific standard in these frameworks (FSOC, 2022). A report by the Financial Stability Oversight Council (FSOC) in 2022 states that under GAAP crypto assets generally meet the definition of live intangibles and are not measured at fair value on a recurring basis. Crypto assets are tested at least annually for impairment. Specialized entities may measure crypto as investments, depending on industry specific standards. Fair value is defined as the price that would be received to sell assets in an orderly market transaction (Spiceland et al., 2020). Intangibles assets are defined as operational assets which lack a physical substance (Spiceland et al., 2020). Intangible assets with indefinite useful lives are tested for impairment, which occurs when there is a significant decline in the assets value (Spiceland et al., 2020). Under GAAP, crypto is defined as an intangible which is tested for impairment, rather than being measured at fair value.

The Financial Accounting Standards Board (FASB) sets the accounting standards for the U.S., and they proposed an exposure draft in March of 2023 regarding crypto assets. This draft states that entities would have to measure certain crypto assets at fair market value at each reporting period and recognize changes in fair value net income. In addition, entities would be required to provide enhanced disclosures for both annual and interim reporting periods. This would provide investors with more relevant information from these disclosures to analyze and assess the exposure and risk of significant individual crypto asset holdings. This guidance would apply to all entities (except specialized entities like investment companies) and can reduce the cost and complexity associated with testing for impairment (FASB, 2023). Crypto assets will be reported differently, changing from being tested for impairment to being recorded at fair value. As shown in the recent standard change by FASB, regulatory bodies are still developing and revising regulation in the cryptocurrency industry.

Crypto Exchanges as Money Service Businesses

A 2022 FSOC report states that crypto assets companies rely on banks as part of their services, and this creates interconnectedness between the industries. This interconnectedness means that there is

overlap wherein regulation meant for another industry will also impact crypto. Bank regulators may limit a bank's activity with crypto assets. Due to this interconnectedness, regulation meant specifically for banks indirectly regulates crypto (FSOC, 2022). Although the SEC and CFTC have taken significant responsibility in regulation, existing laws and rules are also regulating cryptocurrency. Regulatory bodies are taking action to regulate the crypto industry, but there is debate regarding if they can keep pace with the industry. In an interview with news source PYMNTS, Saule Omarova, a professor at Cornell University, stated: "While it may be possible to institute a system of safeguards into a new regulatory framework, it is extremely difficult to get right and extremely difficult to enforce because the digital asset sphere is so dynamic and dependent on technology — and technology moves much faster than regulators do" (qtd. in PYMNTS, 2022).

The 2022 FSOC report highlights a gap in regulation in how crypto exchanges register themselves with the Financial Crimes Enforcement Network (FinCEN) (FSOC, 2022). Cryptocurrency exchanges emphasize that they are registered as Money Service Businesses (MSBs) with FinCEN. However, MSB regulation was not designed to mitigate vulnerabilities for large and interconnected platforms like cryptocurrency exchanges. FinCEN's definition of an MSB includes a business performing as a money transmitter, and/or a currency dealer or exchanger (FinCEN.gov, 2023). The largest MSB in the world is Western Union (Abrams, 2022). MSB regulation focuses on anti-money laundering control at the federal level, and consumer protection in money transmission at the state level (FSOC, 2022).

This creates a gap in the regulation relating to vulnerabilities and market integrity. Coinbase, Binance.US, and Kraken (CoinMarketCap, 2023b), the largest crypto exchange platforms, are all registered as MSBs with the FinCEN (FinCEN, 2023). FTX is also registered as an MSBs with FinCEN. The FSOC Report states:

Some platforms emphasize that they are regulated through MSB laws. These laws generally are intended to address consumer protection related to money transmission and to combat illicit finance. They are not intended to address funding mismatches outside of money transmission or risks posed by platforms

custodying crypto-assets internally within omnibus accounts, particularly when commingled with platform assets. MSB laws and regulations also do not provide a general framework to address run risks of a large multi-activity financial institution. (FSOC, 2022)

This quote shows a clear and significant gap in regulation through crypto exchanges registering as MSBs with FinCEN.

Financial Stability Oversight Council (FSOC) Recommendations

Although there are gaps in cryptocurrency regulation, regulatory bodies are taking action to increase regulation in the industry. As discussed above, the IRS, SEC, FASB, and CFTC have taken steps to set rules and regulation in the industry. Regulation from other industries has also impacted cryptocurrency (FSOC, 2022). Considering these factors, the council made recommendations to address this issue, such as passing legislation that would give federal financial regulators rule making authority over crypto assets that are not securities in the spot market. The spot market is where financial instruments, like securities, are traded immediately in exchange for cash (Smith, 2021). They also recommend that regulators coordinate with each other when a single regulator has limited visibility to all affiliates, subsidiaries, and service providers of an entity. Finally, the council recommends the passing of regulation that would give regulators the authority to have visibility and supervises all an entity's activities with affiliates, subsidiaries, and service providers to address regulatory arbitrage. They recommended that existing authorities gain experience examining crypto assets and evaluate whether exiting authorities are sufficient (p. 111-117).

Conclusion

Cryptocurrency exchanges need stricter regulation. The cryptocurrency market is extremely large with a market cap in April 2023 of \$1.21 Trillion (CoinGecko, 2023). Considering that the first cryptocurrency, Bitcoin, was created just over 10 years ago, this market cap shows tremendous growth. Also, because of interconnectedness between cryptocurrency and sectors such as the banking industry, there are many stakeholders in this market that are impacted by the regulatory

standards. It is essential that proper regulation maintains accuracy and transparency in the industry to protect the stakeholders in the crypto industry and beyond.

Although existing regulation has directly and indirectly applied to the crypto industry, there is still a significant gap in regulation regarding market vulnerabilities and integrity. For example, according to the FSOC, crypto exchanges registered as MSB's with FinCEN do not provide adequate oversight. This can lead to exchanges making risky decisions, creating a lack of transparency, and causing potential failures. The FTX bankruptcy is a clear example of the large impact of a failure of internal controls. With substantial regulation investors have enough trust in the system that their funds will be safe, which would avoid a run on a bank like in FTX's case. Currently, Crypto currency exchanges are operating like traditional financial institutions without being subject to the regulation present in those institutions. Given the situation with FTX and other large-scale frauds occurring in the industry, stricter regulation for exchanges is therefore essential in the industry.

References

- Abrams, A. (2022, February 2). *Money Service Businesses and Their Money Laundering Risks*. The SumSuber.
<https://sumsub.com/blog/money-service-business/#first>
- Amure, T. (2022, November 30) *What are Native tokens?*. Investopedia.
<https://www.investopedia.com/what-are-native-tokens-6754173#:~:text=Native%20tokens%20are%20a%20blockchain%27s%20foundational%20digital%20currency.,functions%20with%20a%20particular%20token.>
- Arrieche, A., & Henn, P. (2023, April 18). *Who are the biggest bitcoin mining companies?*. Capital.com. from <https://capital.com/biggest-global-crypto-bitcoin-mining-companies-ranking-btc>
- Baker, B. (2023, March 27). *Bitcoin mining: What is it and how does it work?*. Bankrate. <https://www.bankrate.com/investing/what-is-bitcoin-mining/>
- CFI Team. (2023, April 4). *Cryptocurrency exchanges*. Corporate Finance Institute.
<https://corporatefinanceinstitute.com/resources/cryptocurrency/cryptocurrency-exchanges/>
- CoinDesk. (2023). *Bitcoin*. CoinDesk. from <https://www.coindesk.com/price/bitcoin/>
- CoinGecko. (2023). *Crypto market cap charts*. CoinGecko.
<https://www.coingecko.com/en/global-charts>
- CoinMarketCap. (2023a). *Today's cryptocurrency prices by Market Cap*. CoinMarketCap. <https://coinmarketcap.com/>
- CoinMarketCap. (2023b). *Top cryptocurrency Spot Exchanges*. CoinMarketCap.
<https://coinmarketcap.com/rankings/exchanges/>
- CoinMarketCap. (2023c). *Top Cryptocurrency Decentralized Exchanges*. CoinMarketCap.
[.https://coinmarketcap.com/rankings/exchanges/dex/](https://coinmarketcap.com/rankings/exchanges/dex/)
- Cointelegraph. (2022, February 11). *Who is the mysterious Bitcoin creator satoshi nakamoto?* Cointelegraph.
<https://cointelegraph.com/learn/who-is-satoshi-nakamoto-the-creator-of-bitcoin>

- Crypto.com. (2023, February 17). *Custodial vs Non-Custodial wallets*. Crypto.com. <https://crypto.com/university/custodial-vs-non-custodial-wallets>
- Cryptopedia Staff. (2022, March 10). *Crypto wallets: Hot vs. cold wallets*. Gemini. <https://www.gemini.com/cryptopedia/crypto-wallets-hot-cold#section-best-of-both-wallet-worlds>
- Ehrlich, S. (2023, March 7). *Beginners guide to crypto regulation*. *Forbes*. from <https://www.forbes.com/sites/digital-assets/article/beginners-guide-to-crypto-regulation/?sh=2775a1936628>
- Euromoney Learning. (2020). *How does a transaction get into the blockchain?*. Euromoney Learning. <https://www.euromoney.com/learning/blockchain-explained/how-transactions-get-into-the-blockchain>
- FASB. (2023, March 23). *Intangibles—goodwill and other—crypto assets (subtopic 350-60)*. *fasb.org*. [https://www.fasb.org/document/blob?fileName=Prop%20ASU%E2%80%94Intangibles%E2%80%94Goodwill%20and%20Other%E2%80%94Crypto%20Assets%20\(Subtopic%20350-60\)%E2%80%94Accounting%20for%20and%20Disclosure%20of%20Crypto%20Assets.pdf](https://www.fasb.org/document/blob?fileName=Prop%20ASU%E2%80%94Intangibles%E2%80%94Goodwill%20and%20Other%E2%80%94Crypto%20Assets%20(Subtopic%20350-60)%E2%80%94Accounting%20for%20and%20Disclosure%20of%20Crypto%20Assets.pdf)
- Fernando, J. (2023, January 13). *Margin and margin trading explained plus advantages and disadvantages*. Investopedia. <https://www.investopedia.com/terms/m/margin.asp>
- Field, J. (2022, December 14). *The utter failure of corporate controls at FTX: CEO John Ray III testifies before US congress*. CoinGeek. <https://coingeek.com/the-utter-failure-of-corporate-controls-at-ftx-ceo-john-ray-iii-testifies-before-us-congress/>
- FinCEN.gov. (2023). *Money Service Business Definition*. FinCEN.gov. <https://www.fincen.gov/money-services-business-definition#:~:text=The%20term%20%22money%20services%20business,money%20orders%20or%20stored%20value.>
- FinCEN.gov. (2023). *MSB registrant search*. FinCEN.gov. <https://www.fincen.gov/msb-registrant-search>
- FSOC. (2022). *Report on Digital Asset Financial Stability Risks and Regulation*. Treasury Department.

- <https://home.treasury.gov/system/files/261/FSOC-Digital-Assets-Report-2022.pdf>
- Gkrtisi, E., Nikiliesh, D. (2022) *White House Calls for Crypto Mining Standards to Minimize Environmental Impact*. CoinDesk. <https://www.coindesk.com/policy/2022/09/08/crypto-mining-energy-implications-need-further-study-white-house-report-says/>
- Gura, D. (2023, January 3). *Sam Bankman-fried pleads not guilty to fraud and other charges tied to FTX's collapse*. NPR. <https://www.npr.org/2023/01/03/1146653595/ftx-ceo-sam-bankman-fried-pleads-not-guilty-to-fraud-charges-collapse>
- IRS. (2014). *Notice 2014-21 Section 1. Purpose - IRS*. irs.gov. <https://www.irs.gov/pub/irs-drop/n-14-21.pdf>
- Key, A. (2022, November 15). *Not your keys, not your crypto: What to know before the next FTX-type meltdown*. Decrypt. <https://decrypt.co/resources/coins-keys-wallet>
- Kenton, W. (2023, April 24). *What are Financial Securities? Examples, Types, Regulation, and Importance*. Investopedia. <https://www.investopedia.com/terms/s/security.asp>
- Kharpal, A. (2023, March 24). *'Can't get their act together': Crypto firms slam SEC, Washington for lack of clarity on rules*. CNBC. <https://www.cnbc.com/2023/03/24/cant-get-their-act-together-crypto-firms-slam-sec-washington-for-lack-of-clarity-on-rules.html>
- Kim, P. (2022, May 31). *The Howey test: A set of rules that determine if an investment is a security*. Business Insider. <https://www.businessinsider.com/personal-finance/howey-test>
- Kingsley, T. (2022, August 9). *Who regulates crypto?*. AAF. <https://www.americanactionforum.org/insight/who-regulates-crypto/>
- Mack, E. (2023, February 24). *The fall of FTX and Sam Bankman-Fried: A timeline*. CNET. <https://www.cnet.com/personal-finance/crypto/the-fall-of-ftx-and-sam-bankman-fried-a-full-timeline-of-events/>
- PYMNTS. (2022, November 22). *What regulators must do now in light of FTX scandal*. PYMNTS.com.

- <https://www.pymnts.com/cryptocurrency/2022/ftx-fraud-and-crypto-market-fallout-demand-regulatory-response/>
- Ramirez, D. (2023, January 10). *FTX crash: Timeline, fallout and what investors should know*. NerdWallet.
<https://www.nerdwallet.com/article/investing/ftx-crash>
- Reiff, N. (2023, February 27). *The collapse of FTX: What went wrong with the Crypto Exchange?* Investopedia.
<https://www.investopedia.com/what-went-wrong-with-ftx-6828447>
- S, R. A. (2023, March 31). *What is blockchain technology? How does blockchain work? [Updated]*. Simplilearn.com.
<https://www.simplilearn.com/tutorials/blockchain-tutorial/blockchain-technology>
- SEC. (2022, December 13). *Press release*. SEC.
<https://www.sec.gov/news/press-release/2022-219>
- SEC. (2022, September 8). *Speech*. SEC.
<https://www.sec.gov/news/speech/genkler-sec-speaks-090822>
- Securities Commission of the Bahamas. (2023). *About Us Who we are*. Securities Commission of the Bahamas.
<https://www.scb.gov.bs/the-commission/about-us/#:~:text=The%20Commission%20is%20responsible%20for%20capital%20markets%20in%20The%20Bahamas>
- Smith, T. (2021, September 29). *Spot Market: Definition, How they work, and Example*. Investopedia.
<https://www.investopedia.com/terms/s/spotmarket.asp>
- SoFi. (2022, September 23). *How does a crypto exchange work?* SoFi.
<https://www.sofi.com/learn/content/how-crypto-exchanges-work/>
- Spiceland, J.D., Nelson, M., & Thomas, W. (2020). *Intermediate Accounting* (10th ed). McGraw-Hill Education.
- Wanjiru, R. (2022, July 30). *Understanding Three Challenges That Make Cryptocurrency Regulation Difficult For Nation States*. Forbes.
<https://www.forbes.com/sites/roselynewanjiru/2022/07/30/understanding-three-challenges-that-make-cryptocurrency-regulation-difficult-for-nation-states/?sh=4793f8bd7352>
- Woo, D., Gordon, I., & Iaralov, V. (2013, December 5). *Bitcoin: a first assessment*. Bank of America Merrill Lynch. <https://files.static->

chmedia.ch/extfile/127c0c3b1fca5320245d73f9921413f2f10b4d0
8

STEM

***Fomes fomentarius*: A Sustainable Plastic Alternative?**

Alijah S. Henderson

In 2018, the worldwide average plastic consumption was calculated at about 359 million tons per year. It is projected that consumption will continue to increase. Only 9 percent of this plastic will be recycled, with the remainder ending up in landfills and incinerators (Blackburn & Green, 2020). There are many different strategies for recycling: primary, secondary, tertiary, and quaternary. Grouping is based partially on whether the plastic is in good condition. The relatively small percentage of plastic recycling is a significant problem as plastics pose a severe threat to our environment due to their ability to withstand degradation over hundreds of years.

Despite the difficulties that plastics bring, many benefits come with plastics, such as being relatively cheap to manufacture. Over the years, we have found many novel uses for plastics as they are less fragile than glass and sturdier than cardboard. Plastics have many different features that allow them to be used in all sorts of applications, such as product packaging, building materials, household appliances, and cosmetics (Blackburn & Green, 2020). Plastics do not degrade quickly. In addition, the average “wear and tear” they can withstand results in tiny fragments of plastics left behind, called microplastics and nano-plastics, depending on the sizing. Plastic must be within .05 to 5mm to be considered a microplastic. In comparison, plastics considered nano-plastics are smaller than .05 mm (Chamas et al., 2020). Plastic pollution is very serious and extremely dangerous to our environment.

Examination of the type of plastics polluting our oceans and environments reveals several common forms of plastics, such as Bisphenol A, commonly called BPA, which can be made synthetically by condensation reactions BPA (Zhou & Hong, 2021). Polyvinyl chloride is commonly called PVC and is created synthetically from a vinyl chloride monomer. PVC has a wide range of uses due to its qualities, such as being resistant to combustion (Čolnik et al., 2022). Polyethylene terephthalate is commonly known as PET; this plastic is a thermoplastic that has many features that can contribute to its application, such as chemical and

thermal stability, durability, and easy processability (Webb et al., 2012). Polypropylene Polyethylene is commonly called PE and can be made into different forms: high-density polyethylene, low-density polyethylene, and linear low-density polyethylene based on its side chains that all have different features (Yao et al., 2022). These plastics can be found in many aspects of our lives, from clothing materials like fleece created from PET to piping made of PVC.

Although these plastics have benefited humans, they may also be our downfall due to the risks and dangers they may create. These plastics are each made differently, including various chemical compositions and additives. Additives create durability, flexibility, and lightness, among other standard features associated with plastic. However, these additives are not necessarily safe for human consumption as they may cause various health issues by their presence as well as accumulation and storage in the body (Blackburn & Green, 2020). Plastics also put animal and human health in danger as specific types of plastics have been linked with pathogens vectors and increased estrogen levels (Lear et al., 2021). Many animals will suffer from the effects of plastic pollution. Animals trapped in plastic have suffocated, and some have also starved from eating the plastic. Even animals who do not die are not entirely spared as microplastics build up in their bodies, leading to further health issues (Blackburn & Green, 2020).

After learning about the benefits and costs of plastics, we have a choice to make. Do we continue along the path of destruction that makes us vulnerable to illness, pollution, and contamination? Or will we find a way to overcome the issues that plastic usage has brought, looking to other, more natural and sustainable sources?

Types of plastic alternatives include biodegradable plastics, glass, wood, metals, and fungi. One alternative candidate that has fantastic potential to replace plastic materials is fungi. Fungi hold a whole new world of possibility, as they are both a sustainable and biodegradable resource. Fungi even possess the ability to degrade petroleum-based plastics. Due to this, fungi are an excellent alternative resource for dealing with the problem of plastic pollution and degradation (Lange, 2014).

Fungi are heterotrophic eukaryotes that gain energy by absorbing sustenance from outside their cells. Fungi are a large and diverse kingdom that belongs to the supergroup Opisthokonta, which

shares deep familial ties with many plants. One of the oldest forms of fungi is zoopagomycota. This fungus is thought to have evolved into Mucoromycota, which is still seen today; these fungi belong to the convergently evolved species that make hyphae. Fungi have evolved to have different features that aid their survival by trafficking nutrients, protection, and stopping diffusion. These features include but are not limited to hyphae, mycelium, septate structures, fruiting bodies, and mycorrhizae (Nagy et al., 2017). Hyphae are the branches that work to make up mycelium. There are two forms of hyphae, septate and coenocytic, which are categorized based on whether a septum separates nuclei. Mycelium is composed of hyphae; this will aid spores while they disperse and create progeny. When many hyphae work together, they can create mycelium, which will extend outwards in search of essential dietary requirements (Bledsoe, 2022). Septate structures are found within septate or around septate, and these are woronin bodies and dolipore septum; they both work to help maintain a balance of nutrients. Fruiting bodies have been used to order and classify types of fungi. This is due to the numerous shapes a fruiting body can take on depending on the species of fungi. The development of fruiting bodies is highly dependent on various transcription factors, including structural and effector genes, along with lectin, a cell wall protein (Nagy et al., 2017). Fungi tend to grow best in aerobic environments, with the following substances being provided as a food source: glucose, ammonium salts, inorganic ions, and growth factors (Kavanagh, 2018). Mycelium can be grown to create different types of materials depending on the fungi used. In a study to see if mycelium composite materials are good alternatives to plastics, researchers were able to show that the different types of mycelia that were created with different types of fungi each created unique forms of mycelium (Balaeş et al., 2023). These findings prove the many forms of fungi mycelium have the potential to replace plastic usage.

Fungi are so diverse: there are multiple ways that reproduction can occur. "Many species can exist as unicellular (ex. yeasts) and multicellular organisms (ex. molds and mushrooms) and dimorphs, which can create both yeast and mold. Some yeasts reproduce asexually through budding or a process termed fission while molds reproduce sexually" (Bledsoe, 2022). Unicellular organisms are believed to be the result of de-evolution from multicellular fungi. These fungi will not become

filamentous, but in specific circumstances, they may create hyphae-like structures. Due to the nature of yeast to not be filamentous, it must receive nutrients in wet environments. Multicellular fungi are a form of fungi that can develop hyphae. This structure allows them to be utilized for symbiosis as they can help aid plants by bringing them nutrients through their long hyphae that band together to make mycelium. Dimorphic fungi will use fungal transcripts to start the production of yeast to hyphae to shift the organism to a dimorphic state (Nagy et al., 2017).

The different reproduction processes can lead to different results and added benefits to the organism. Sexual reproduction will work to help add adaptations and prevent undesirable genes from being passed along, unlike asexual reproduction, which will produce an exact copy of its parent (Usher, 2019). This process involves the creation of spores. The process of sexual reproduction can be incredibly complicated as many different things occur during its cycle, such as the cytoplasm being meshed with the mycelium and the nuclei being meshed with the cytoplasm. After meiosis, the cellular process through which spores are made, the fungi undergo germination to form mycelium (Bledsoe, 2022). Rhizomorphs and cords are essential for reproducing fungi as these structures help deliver water and dietary needs throughout the fungi (Kavanagh, 2018).

Fungi have established many different symbiotic relationships in nature. For example, fungi and plants work together without harming each other to have fungi deliver nutrients to the plants. Fungi can also dissolve materials, a helpful trait for recycling materials. Fungi also can be parasitic. For example, chytrids commonly infect frogs and cause them to lose their ability to breathe using their skin, resulting in suffocation (Bledsoe, 2022). Too often, we see in the media information on how fungi can lead to terrible health diseases, such as nail infections, histoplasmosis, and pneumocystis pneumonia, among other various diseases and infections. Nail infections are quite common among the population, affecting around 14 percent of people. Symptoms include minor pain and abnormal appearance (CDC, 2022 a). Histoplasmosis, caused by *Histoplasma* sp., is contracted by breathing in the spores and causes symptoms such as fever, coughing, and fatigue (CDC, 2020 b). Pneumocystis pneumonia is a disease that dampens the immune system and, in combination with HIV/AIDS, includes symptoms such as

labored breathing, exhaustion, coughing, elevated temperature, chills, and chest pain (CDC, 2021 c). However, fungi are involved with many positive aspects of life as well.

Fungi are responsible for the production of alcohol through their ability to ferment a variety of products. Fungi also play a role in food preservation through fungal enzymes that can replace the need for added preservative chemicals. Fungi create many antimicrobials and medications, such as antibiotics. Climate change may be impacted by fungi as well due to the ability of fungi to lower CO₂ emissions (Lange, 2014). Research by the University of Sheffield provided information on how this happens and an estimate of how much carbon is stored per year. This process is completed by a plant's symbiotic relationship with fungi. Plants will shuttle carbon, taking it in and delivering it to mycorrhizal fungi. The fungi then work to break down the carbon, utilize it for nutrients, and create a carbon-based soil. According to researchers at the University of Sheffield, around 13 gigatons of carbon will be stored by fungi, which roughly translates to 36 percent of emissions stored year-round (University of Sheffield, 2023). However, fungi's hidden talent may be their ability to create alternative plastics. This will be extremely important in the future when we can no longer avoid our plastic pollution problem. Fungi are an excellent potential alternative to plastics as they can already have various roles while maintaining the ability to remain a sustainable source. Fungi can be used to create many kinds of packaging materials, insulators, construction materials, and clothing like leather. The key to Fungi being able to create these forms of alternative plastics is fungal mycelium. Once the mycelia have grown, they can undergo different types of molding and heating to obtain the desired shape and type of plastic. One promising fungi with mycelia that can be grown this way is *Fomes fomentarius*, classified as a white rot basidiomycete. Basidiomycetes are types of mushrooms that have a wide shape arrangement and have mycorrhizae called ectomycorrhiza that can degrade wood (Lange, 2014). See Figure 1.

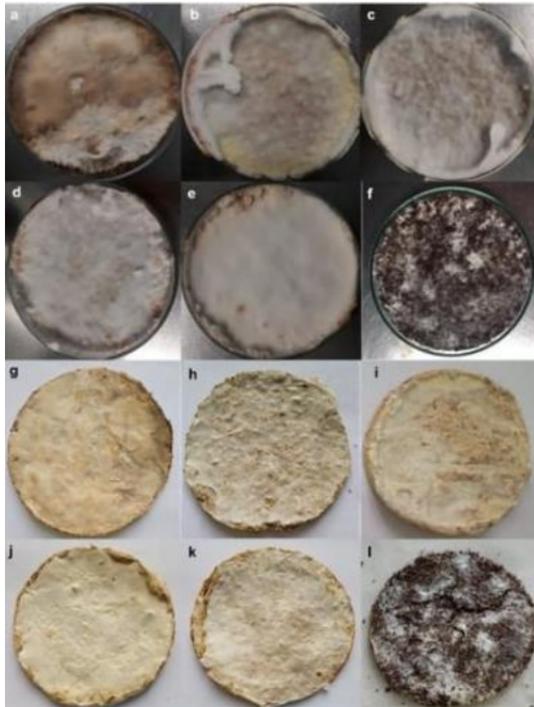


Figure 1. This photo depicts the growth pattern of the fungi grown in the different types of substrates (Balaeş et al., 2023).

Creating fungal-based plastics

To create fungal-based alternative plastics, we need to understand the process of making them. To cultivate fungi for plastic creation, there are specific steps that need to be followed. The first step of cultivating fungi is choosing a filamentous fungal species so that it is possible to manipulate the mycelium. Once a potential candidate fungal species is identified, it is grown for a period of time that will vary

depending on the growth conditions and characteristics of the fungal species. The fungi are inoculated under controlled conditions, including growth substrates (Balaeş et al., 2023).

In experiments with *Fomes fomentarius*, different substrates were used to determine optimal growth conditions. Substrates tested included malt extract agar, glucose agar medium, millet culture, hemp shives, and rapeseed straw. Once the growth process was complete, additional testing was conducted, and data was collected, such as weight, the ability to transmit heat, and compression tests. This study showed that *Fomes fomentarius* possesses qualities comparable to those of synthetic foams. As well as potential uses for the fungi as it produced different types of materials, which depend on the substrate they are grown on. Compared to expanded polystyrene, *Fomes fomentarius* performed better in compression tests as they could resist a force of .2 MPa at 50% with the substrate hemp shive. However, they were not able to see the same success when they were tested for elasticity, where EPS was found to outlast *Fomes fomentarius* by four times. (Pohl et al., 2022). Another test that used *Fomes fomentarius* tried to reproduce the conditions found when the fungus was harvested from its natural environment. It was stored for one month in preparation for creating the cubes from the fungi; this was used for compression testing. The fruiting body was cut in 2 cm thick cuts, and then the slices from the center were cut into bars and segmented into slices. Only cubes that looked similar in structure were used for compression tests; the whole process of creating a cube took around five hours. Once the cubes were created, they were dried in an oven at 60 degrees Celsius for 20 hours to stop the growth of the fungi. This study showed that *Fomes fomentarius* mycelium, which was dried out, resulted in a higher stress level during compression tests. There was also additional information about how dried-out mycelium showed higher energy absorption levels. It was also noted that the shape of the fungus played a role in higher energy absorption levels. However, when tested for failure behavior, it was discovered that wet mycelium will show the best recovery as it will nearly go back to its original state. In contrast, dry mycelium will show cracks and permanent damage. The final conclusions that were drawn about this fungus stated that it resembles a lightweight foam. (Müller et al., 2021). See Figure 2.

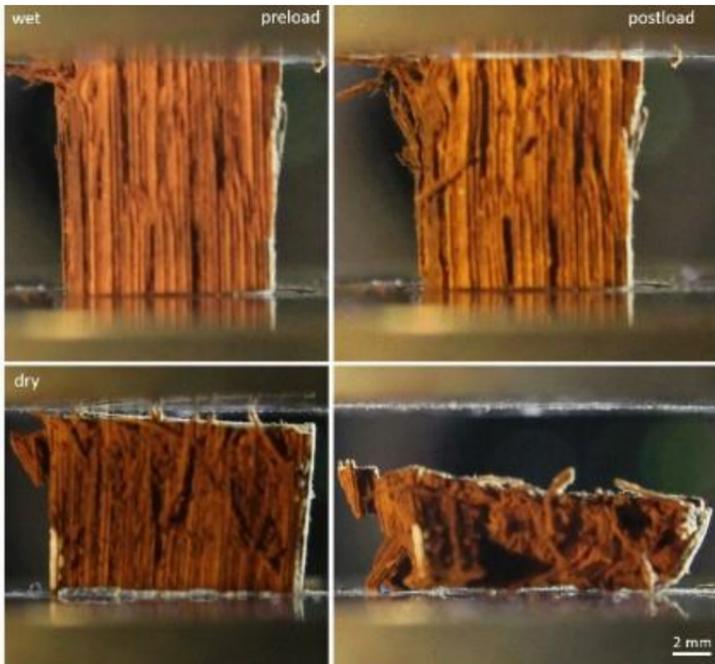


Figure 2. This photo depicts a stress failure test on both wet and dry fungi to see how they can recover from the stress applied. In this picture, you can see that the fungi that remained wet can make the best recovery while the dry fungi remained permanently damaged (Müller et al., 2021).

Comparison of degradation of bioplastics and fungi-based plastics

When discussing the best type of alternative plastic, we must consider how the product will be degraded. Bioplastics is an emerging area of plastic alternative research that claims to be biodegradable and a far more sustainable alternative to plastics. Bioplastics are made from

organic and synthetic polymers, creating various types of plastics (Demirgöz et al., 2000). A 2022 article published by the American Chemical Society focused on how bioplastics in the ocean are degraded. They determined that degradation occurs in two forms: abiotic and biotic degradation. The rate of degradation of bioplastics is determined by composition and environmental factors. The environmental conditions needed to degrade bioplastics are often unmet, which can lead to bioplastics becoming less sustainable than originally thought. Four types of bioplastics, poly L- lactic acid (PLLA), poly (3-hydroxybutyrate/ 3-hydroxyvalerate) (PHB/HV), plasticized starch (PR), and cellulose acetate (CA), were tested. They had a range of widths between .05 to .025 mm to ensure that they were truly able to be degraded. PLLA was able to garner a large gathering of alpha and gamma proteobacteria in both the 6 and 12 months. Another crucial piece of evidence showed that this bioplastic had never undergone any surface erosion, which meant it had not started the process of degradation after a year. This evidence proves that PLLA is not a plastic that is truly biodegradable and will, in turn, cause more harm to our environment. There were even indications that the PLLA was starting to become fragmented, leading to the development of microplastics. However, the results for PHB/HV and PR were very different. These bioplastics were almost completely degraded in six months, which shows that these bioplastics will pose little to no harm to the environment and be a good alternative to petroleum-based plastics. It was also discovered that by one year, CA lost 80% of its mass. This is believed to occur due to the width used (Eronen-Rasimus et al., 2022). See Figure 3.

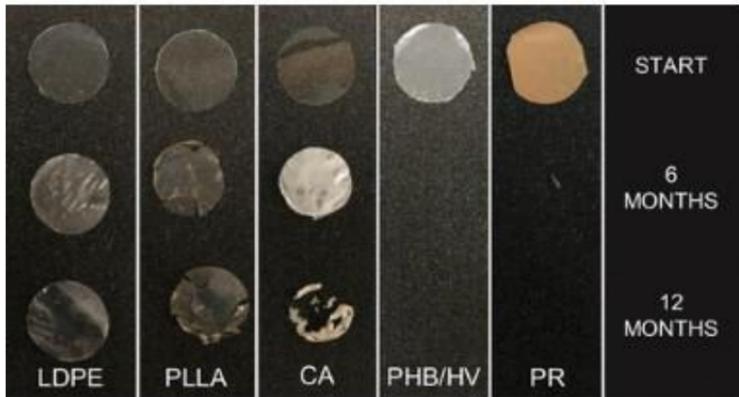


Figure 3. This photo depicts how bioplastics will be degraded at a timeline of 6 months and 12 months. This picture shows that the degradation rates between the different types of plastics have varying degradation rates (Eronen-Rasimus et al., 2022).

Another study conducted to see how bioplastics degrade demonstrated that not all bioplastics are created equally. In this study, four materials were used: starch-based polymer Mater Bi MB, polybutylene adipate terephthalate PBAT, polylactic acid PLA, and low-density polyethylene LDPE. Fourier Transform Infrared spectrum was used as a tool to measure how bioplastics degraded by analyzing the chemical bonds formed. These materials were all put in compost, kept in thermophilic conditions for 20 days (about 3 weeks), and left to mature for 40 days. During this time, the containers would open weekly, and the humidity was constantly maintained at 50-55 percent. There were two checkpoints to observe the bioplastic degradation, the first at 20 days and the second at 60 days. The results from this study showed that both MB and PBAT were fully degraded after 60 days. The bioplastic PLA did not show signs of degradation even at the 60-day checkpoint, which resembled the plastic LDPE that was used in the experiment (Ruggero et al., 2021). Although the usage of bioplastics showed great promise, there

could be a better way to combat our plastic pollution by possibly eradicating plastics. Fungi are such versatile organisms that they can be used in a host of ways. Most notably for their production of plastic and foam-like materials, as well as properties that work to degrade plastics. Fungido this by the enzymes that each species of fungi possesses. However, this process by itself does not occur quickly; it can take a long time if not partnered with photodegradation and thermo-oxidative mechanisms. The most common types of enzymes that were used are cutinase, lipase, proteases, and lignocellulolytic enzymes. The enzymes classified as cutinases belong to the esterase subclass, and they will dissolve polyesters with a high molecular weight. Many types of fungi can produce this enzyme, such as *Humicola insolens*, *Fusarium solani pisi*, *Arxula adenivorans*, and many more species of fungi. Both *Humicola insolens* *Fusarium solani pisi* can perform degradation of PET plastics that are not structurally dense. Plastic can be caused to degrade by four physiochemical responses, which are dependent on the environment they are in (Zhang et al., 2021). The four types of responses are photodegradation, biological degradation, mechanical degradation, and thermal degradation (Fotopoulou & Karapanagioti, 2017). According to the UN's environmental program, it may take around 1000 years for plastics to degrade on land without the help of biological sources, while plastic bags may degrade by 450 years (United Nations, 2023). On average, 97-percent of plastic was lost within 96 hours (about 4 days) of the fungi releasing the enzymes on the plastic. *Arxula adenivorans* has the capability to degrade polycaprolactone fiber mats. Lipases are another subclass of esterases that work to degrade materials with a high lipid content. The fungi that are known to secrete this enzyme are *Rhizopus delemer*, *Candida rugosa*, *Thermomyces lanuginosus*, and more. The fungi *Rhizopus delemer* can be used to degrade polyurethanes that are polyester-like. Within a day, it could be seen that around half of its weight was lost. While *Candida rugosa* was found to degrade poly butylene succinate-co-hexamethylene succinate. *Thermomyces lanuginosus* was found to degrade electrospun polycaprolactone fibers plastics. Proteases are a class of enzymes that work by cutting up peptide chains or degrading proteins to peptide chains. The fungi that can secrete this enzyme are *Anthrobotrys oligospora*, *Aspergillus*, *Penicillium*, and many others, as many fungi produce these. The fungi *Anthrobotrys oligospora* has the potential to degrade polylactic

acid by creating serine proteases. Laccases are a form of lignocellulolytic enzyme that works to speed up oxidation reactions in phenolic compounds. This enzyme can oxidize the hydrocarbon backbone of polyethylene and form water as a byproduct of its reaction. The fungi that secrete this enzyme are *Cochliobolus sp.*, *Pleurotus ostreatus*, and many more. *Cochliobolus sp.* is a fungus that can degrade PVC by secreting laccase. Peroxidase is another class of lignocellulolytic and oxidoreductase enzymes which function by helping redox reactions. There is a subset of these enzymes, such as manganese, lignin, and versatile peroxidases. The fungi that can secrete peroxidases are *Fusarium graminearum*, *Aspergillus flavus*, *Aspergillus niger*, but not limited to these (Srikanth et al., 2022). A study on the types of fungi that were isolated from the shore of Lake Zurich was conducted on September 2, 2015, by Brunner and his team of scientists. The plastics collected either came from pieces floating on the water or picked up by the shore. The plastics that were found in that lake were mainly polyethylene and polyurethane. The isolated fungi were used to see if the fungi could break the plastics down. The results showed that there was no strong evidence that the isolated fungi could break down PE, even those that had lignocellulolytic enzymes. However, a few of the fungi were able to break down PU, such as *Aspergillus*, *Penicillium*, and *Trichoderma* (Brunner et al., 2018). See Figure 4.

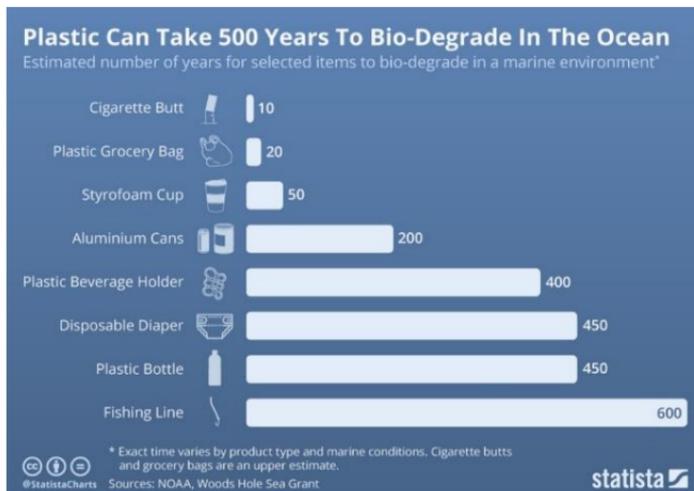


Figure 4. This chart helps to illustrate how long it takes for plastic to degrade in marine environments (Whiting, 2018).

Conclusion

To help end plastic pollution, we need to find an alternative that benefits our environment. Fungi will help to lessen our plastic waste. Fungal-based plastics can aid in packaging, clothing, automotive materials, medical materials, and materials used in electronics (Cerimi et al., 2019). Although some bioplastics are marketed as sustainable, they will cause even more pollution. The best alternative is one that comes directly from natural fungi. As we continue to discover the benefits of fungal-based plastics, we also need to keep in mind how much these resources could potentially cost, as well as a better understanding of whether there is a place on the market for fungal-based plastics. According to research by EUROFUNG, a network that focuses on fungal biotechnology, fungal-associated materials such as enzymes already make

around 4.7 billion euros, which may double in the coming years. A company named Roal Oy has started to mass-produce fungi such as *Aspergillus niger* and *terreus*. These fungi are used for a host of commodities, not only fungal-based plastics. Although there have not been clear projections of the monetary impacts of fungal-based plastics, we can already see that there is a clear market for fungal-based materials (Meyer et al., 2016).

References

- Balaeş, T., Radu, B.-M., & Tănase, C. (2023, February 6). *Mycelium-composite materials-a promising alternative to plastics?* MDPI. Retrieved April 5, 2023, from <http://dx.doi.org/10.3390/jof9020210>
- Blackburn, K., & Green, D. (2020, December 6). *The potential effects of microplastics on human health: What is known and what is unknown.* *Ambio*. Retrieved April 5, 2023, from <https://pubmed.ncbi.nlm.nih.gov/34185251/>
- Bledsoe, G. (2022, January 28). *Fungi. canvas.* Retrieved April 6, 2023, from <https://umsystem.instructure.com/courses/68368/files/folder/BIOL%20109%20Slides?preview=856680>
- Brunner, I., Fischer, M., Rüthi, J., Stierli, B., & Frey, B. (2018, August 22). *Ability of fungi isolated from plastic debris floating in the shoreline of a lake to degrade plastics.* *PLOS ONE*. <https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0202047>
- (a) Centers for Disease Control and Prevention. (2022, September 13). *Fungal nail infections.* Centers for Disease Control and Prevention. <https://www.cdc.gov/fungal/nail-infections.html>
- (b) Centers for Disease Control and Prevention. (2020, December 29). *Histoplasmosis.* Centers for Disease Control and Prevention. <https://www.cdc.gov/fungal/diseases/histoplasmosis/index.html>
- (c) Centers for Disease Control and Prevention. (2021, October 13). *Pneumocystis pneumonia.* Centers for Disease Control and Prevention. <https://www.cdc.gov/fungal/diseases/pneumocystis-pneumonia/index.html>
- Cerimi, K., Akkaya, K. C., Pohl, C., Schmidt, B., & Neubauer, P. (2019, October 26). *Fungi as source for new bio-based materials: A patent review - fungal biology and biotechnology.* *BioMed Central*. Retrieved April 21, 2023, from <https://fungalbiolbiotech.biomedcentral.com/articles/10.1186/s40694-019-0080-y>
- Chamas, A., Suh, S., Scott, S. L., Abu-Omar, M., Jang, J. H., Tabassum, T., Qiu, Y., Zheng, J., & Moon, H. (2020, February 3). *Degradation rates of plastics in the environment - ACS publications.* *ACS*

- Publications. Retrieved April 6, 2023,
from <https://pubs.acs.org/doi/10.1021/acssuschemeng.9b06635>
- Čolnik, M., Kotnik, P., Knez, Ž., & Škerget, M. (2022, September 26). Degradation of polyvinyl chloride (PVC) waste with supercritical water. MDPI. Retrieved May 2, 2023, from <https://www.mdpi.com/2227-9717/10/10/1940>
- Demirgöz, D., Elvira, C., Mano, J. F., Cunha, A. M., Piskin, E., & Reis, R. L. (2000, November 30). *Chemical modification of starch based biodegradable polymeric blends: Effects on water uptake, degradation behaviour and mechanical properties*. Polymer Degradation and Stability. Retrieved April 5, 2023,
- Eronen-Rasimus, Eeva L., Näkki, Pinja P., and Kaartokallio, Hermann P. *Environmental Science & Technology* **2022** 56 (22), 15760–15769 DOI: 10.1021/acs.est.2c06280
- Establishment of the basidiomycete fomes fomentarius for the production of composite materials - fungal biology and biotechnology*. BioMed Central. Retrieved April 5, 2023,
from <https://doi.org/10.1186/s40694-022-00133-y>
- Fotopoulou, K. N., & Karapanagioti, H. K. (2017, April). *Degradation of various plastics in the environment - researchgate*. Research Gate.
https://www.researchgate.net/publication/316040856_Degradation_of_Various_Plastics_in_the_Environment
- Islam, M. R., Tudryn, G., Bucinell, R., Schadler, L., & Picu, R. C. (2017, October 12). *Morphology and mechanics of fungal mycelium*. Nature News. Retrieved April 5, 2023,
from <https://www.nature.com/articles/s41598-017-13295-2/>
- Kavanagh, K. (2018). *Fungi: Biology and Applications* (3rd ed.). Wiley Blackwell.
- Lange, L. (2014, December 12). *The importance of fungi and mycology for addressing major global challenges**. IMA fungus. Retrieved April 6, 2023,
from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4329327/>
- Lear, G., Kingsbury, J. M., Franchini, S., Gambarini, V., Maday, S. D. M., Wallbank, J. A., Weaver, L., & Pantos, O. (2021, January 20). *Plastics and the microbiome: Impacts and solutions - environmental microbiome*. BioMed Central.

- <https://environmentalmicrobiome.biomedcentral.com/articles/10.1186/s40793-020-00371-w>
- Meyer, V., Andersen, M. R., Brakhage, A. A., Braus, G. H., Caddick, M. X., Cairns, T. C., de Vries, R. P., Haarmann, T., Hansen, K., Hertz-Fowler, C., Krappmann, S., Mortensen, U. H., Peñalva, M. A., Ram, A. F. J., & Head, R. M. (2016, August 31). *Current challenges of research on filamentous fungi in relation to human welfare and a sustainable bio-economy: A white paper - fungal biology and biotechnology*. BioMed Central. Retrieved April 5, 2023, from <https://fungalbiolbiotech.biomedcentral.com/articles/10.1186/s40694-016-0024-8>
- Morphology and mechanics of fungal mycelium*. Nature News. Retrieved April 5, 2023, from <https://www.nature.com/articles/s41598-017-13295-2/>
- Müller, C., Klemm, S., & Fleck, C. (2021, February 10). *Bracket fungi, natural lightweight construction materials: Hierarchical microstructure and compressive behavior of fomes FOMENTARIUS fruit bodies - applied physics a*. SpringerLink. Retrieved April 5, 2023, from <https://link.springer.com/article/10.1007/s00339-020-04270-2>
- Nagy, L. G., Toth, R., Kiss, E., Slot, J., Gascér, A., & Kovacs, G. M. (2017, August 18). *Six Key Traits of Fungi: Their Evolutionary Origins and Genetic Bases*. Europe PMC. <https://europepmc.org/article/MED/28820115>
- Pöhl, C., Schmidt, B., Nunez Guitar, T., Klemm, S., Gusovius, H.-J., Platzk, S., Kruggel-Emden, H., Klunker, A., Völlmecke, C., Fleck, C., & Meyer, V. (2022, February 24). *Establishment of the basidiomycete fomes fomentarius for the production of composite materials - fungal biology and biotechnology*. BioMed Central. Retrieved April 5, 2023, from <https://doi.org/10.1186/s40694-022-00133-y>
- Ruggero, F., Onderwater, R. C. A., Carretti, E., Roosa, S., Benali, S., Raquez, J.-M., Gori, R., Lubello, C., & Wattiez, R. (2021, February 27). *Degradation of film and rigid bioplastics during the thermophilic phase and the maturation phase of simulated composting - journal of polymers and the environment*.

- SpringerLink. Retrieved April 20, 2023, from <https://link.springer.com/article/10.1007/s10924-021-02098-2>
- Srikanth, M., Sandeep, T. S. R. S., Sucharitha, K., & Godi, S. (2022, April 8). Biodegradation of plastic polymers by Fungi: A Brief Review - bioresources and Bioprocessing. SpringerOpen. <https://bioresourcesbioprocessing.springeropen.com/articles/10.1186/s40643-022-00532-4#:~:text=ln%20biodegradation%2C%20the%20process%20is%20initiated%20by%20micro-organisms%2C.of%20environmental%20factors%2C%20such%20as%20temperature%20and%20pH>
- University of Sheffield. (2023, June 5). *Fungi stores a third of carbon from fossil fuel emissions and could be essential to reaching net zero, New Study reveals*. ScienceDaily. <https://www.sciencedaily.com/releases/2023/06/230605181230.htm>
- United Nations. (2018, April). *Plastic planet: How tiny plastic particles are polluting our soil*. UNEP. <https://www.unep.org/news-and-stories/story/plastic-planet-how-tiny-plastic-particles-are-polluting-our-soil>
- Usher, J. (2019, October 21). The mechanisms of mating in pathogenic fungi—a plastic trait. MDPI. Retrieved May 3, 2023, from <https://www.mdpi.com/2073-4425/10/10/831>
- Voberkova, S., Vaverkova, M. D., Buersova, A., Adamcova, D., Vrsanska, M., Kynicky, J., Brtnicky, M., & Adam, V. (2017, January 5). *Effect of inoculation with white-rot fungi and fungal consortium on the composting efficiency of municipal solid waste*. Shibboleth authentication request. Retrieved April 5, 2023, from <https://www.sciencedirect.com/proxy.library.umkc.edu/science/article/abs/pii/S0956053X16307760>
- Webb, H. K., Arnott, J., Crawford, R. J., & Ivanova, E. P. (2012, December 28). Plastic degradation and its environmental implications with special reference to poly(ethylene terephthalate). MDPI. Retrieved May 2, 2023, from <https://www.mdpi.com/2073-4360/5/1/1>

- Whiting, K. (n.d.). *This is how long everyday plastic items last in the Ocean*. World Economic Forum.
<https://www.weforum.org/agenda/2018/11/chart-of-the-day-this-is-how-long-everyday-plastic-items-last-in-the-ocean/>
- Yao, Z., Seong, H. J., & Jang, Y.-S. (2022, August 3). Environmental toxicity and decomposition of polyethylene. *Ecotoxicology and Environmental Safety*. Retrieved May 2, 2023, from <https://www.sciencedirect.com/science/article/pii/S0147651322007734#:~:text=Polyethylene%20is%20the%20most%20common%20form%20of%20wastes%20in%20environments.&text=PE%20can%20be%20decomposed%20by%20photo%20%26%20thermal%20oxidations%2C%20chemical%20hydrolysis.&text=PE%20can%20be%20biodegraded%20by%20microorganisms%20and%20invertebrates.&text=Multiple%20PE%20biodegradation%20pathways%20are%20to%20be%20elucidated%20further.>
- Zhang, K., Hamidian, A. H., Tubic, A., Zhang, Y., Fang, J. K. H., Wu, C., & Lam, P. K. S. (2021, January 23). *Understanding plastic degradation and microplastic formation in the environment: A Review*. *Environmental Pollution*.
- Zhou, J., & Hong, S. H. (2021, November 18). *Establishing efficient bisphenol A degradation by engineering ...* ACS Publication.
<https://pubs.acs.org/doi/10.1021/acs.iecr.1c03324>

The Spanish Inquisition and its Impact on Mathematics in Spain during the Seventeenth Century: A translation of excerpts from J. Zaragoza's Trigonetría Española

Rye Ledford

The dawn of the scientific revolution encouraged innovation, modernization, and discovery that spanned Europe during the seventeenth century. Many countries, such as France and Britain, promoted theoretical mathematical and scientific advances that would lead to modern day calculus and physics. However, not all countries shared this newfound intellectual development. Spain, once a globally dominant empire, had squandered its fortune through wars of reconquest and expansion. Because of the Spanish Inquisition and the burden of state debt, this country was preoccupied with applied sciences, such as astronomy, cartography, navigation, and trade. While this emphasis was important, this lack of focus on modern science innovation stunted the country's movement to modernization ("J. Zaragoza's Centrum Minimum, an Early Version of Barycentric Geometry" 695). In comparison to the many achievements of other European scholars, such as Sir Isaac Newton (1643-1727) and Pierre de Fermat (1601-1665), Spain produced only a few known notable academics during the seventeenth century ("Mathematicians Born in Spain"). One of these was the Jesuit professor, mathematician, and astronomer, Joseph Zaragozá. There were many complex reasons for the stifled seventeenth century academic landscape in Spain. Despite the Spanish Inquisition and the burden of the Crown's debt, the scholarly tenacity of Father Joseph (José) Zaragozá (1627-1679) testifies to the enduring spirit of intellectual pursuit and the ability to overcome obstacles.

King Ferdinand II (1452-1516) and Queen Isabella I (1451-1504) established the Spanish Inquisition on 27 September 1480 by instituting a separate Holy Office in Castile and appointing the first Spanish inquisitor (Perez 21). In Paul Hauben's edition of *The Spanish Inquisition*, he notes, "Its history is often confounded with racialism, religious tyranny,

obnoxious legal procedures, the permanent delaying of Spanish modernization, and other equally regressive matters" (1). The Spanish Inquisition's principal goal was to form a united faith within the Kingdom of Castile, which would become the heart of modern-day Spain. To complete their objective, the Holy Office forced Jewish and Muslim citizens to convert to Catholicism and be labeled as *conversos*. In addition, they expelled those who would not convert, and used brutal torture against those who spoke out against the orthodox Catholic Church (Perez 22-24). This persecution of non-Catholics further constrained the development and publication of academic literature and thought by stifling religious and intellectual diversity, discouraging open discourse, and limit scholarly exchanges.

The Holy Office also created various positions of power to maintain order within the state. These positions included the Grand Inquisitor, appointed delegated inquisitors, voluntary officiants, and the counselors of the Council of the Inquisition, also known as the *Suprema* (Perez 101-121). Despite the inquisition's violent approach to spread Christianity within Spain, some positions were specifically created to quell theological or scientific thought that would be considered blasphemous to the Holy Office (Perez 119). The specific role of the *Calificador del Santo Oficio* or The Holy Office Qualifier, who was a voluntary officiant, was to judge the contents of all books, publications, manuscripts, and treatises circulated in Spain and determine if they were against the word of the Spanish Inquisition Doctrine. *Calificadores* were most often from the religious orders Franciscans and Jesuits during the seventeenth century, but they were not a united group, and their subjective opinions often contradicted one another, leading to many works being delayed in the approval process (Perez 119).

The Inquisition itself was most concerned with limiting books already in circulation, hence the Holy Office created The Index in 1540 which listed banned works and authors (Kamen 103-105). In 1612, an updated Index was published, and two notable authors were included because of their works: Dante (1265-1321) and Galileo (1564-1642), as their respective works contained sacrilegious content (Kamen 117). Later, the 1640 index included the entire collection of works of Johannes Kepler (1571-1630) and Tycho Brahe (1546-1601) simply because they were Protestants (Kamen 117). All four authors influenced the academic

community of their time, and their impact was so important it continues to resonate with modern works. However, they were all held in contempt by the religious authority in the Iberian Peninsula. Kamen writes: "By the late seventeenth century, on the other hand, it was clear that English and Dutch intellectuals had become the pioneers in science and medicine. They were Protestants, and their books automatically fell within the scope of the inquisitorial bans" (134).

The Index was not the only institution that prevented circulation of literature in Spain. To print books, printers had to get licenses, but obtaining a license from the council of Castile could take years, so most books were published outside of Spain during the reign of the Inquisition (Kamen 106). Authors seeking license from the council were also subject to censorship before and after publication (Kamen 106). While the Spanish Crown and Inquisition couldn't effectively ban all literature or destroy all books listed on the Index, they were overall successful at slowing the pace of intellectual growth. works being delayed in the approval process (Perez 119).

Despite the restrictions established by the Holy Office, Father Joseph (José) Zaragoza was one figure able to access all publications regardless of censorship or banned statues. While no concrete record of his youth exists, it is known where he was born, where he studied, and where he continued his professional career. He was born in Valencia and completed studies at the University of Valencia. He then joined the Society of Jesus where he became a Jesuit Priest and began his career as a scholar and a teacher. He was self-taught in mathematics and physics as his formal education was in theology (Bordas 392). Much of what is known about Zaragoza can be gleaned by the introductory portions of his works which were published between 1669 and 1679 (*Arithmetica Universal*). It is mentioned that he taught at Universities in Mallorca, Barcelona, and Valencia (*Arithmetica Universal, Esphera en Comun Celeste, Euclides Nuevo-Antiqtuo, Geometria Especulativa, Geometria Magna, Trigonometria Espanola*). In 1675 he was appointed as Prince Charles II of Spain's (1661-1700) primary mathematics teacher. Prince Charles held Zaragoza as a close confidant until Zaragoza's death in 1679 (Bordas 393).

All of Father Joseph Zaragoza's works were licensed by the Spanish Inquisition and given special blessings from the Kings and Queens of Spain and Portugal (*Arithmetica Universal, Esphera en Comun Celeste,*

Euclides Nuevo-Antiiguo, Geometria Especulativa, Geometria Magna, Trigonometria Espanola). In his listed works, he was given the title *Calificador del Santo Oficio* (qualifier for the Holy Office) meaning he was a member of the Spanish Inquisition during the latter part of the seventeenth century (*Arithmetica Universal, Esphera en Comun Celeste, Euclides Nuevo-Antiiguo, Geometria Especulativa, Geometria Magna, Trigonometria Espanola*). The primary role of a qualifier for the Holy Office was as follows:

When it was thought that enough charges against an individual had been amassed, the whole file (known as a *sumaria*) was passed to the qualifiers, who were required to pick out anything in the actions, speech or writing of the accused that implied that this individual was a heretic or strongly suspected of being one. The qualifiers were also frequently asked to pronounce on books of a doubtful nature from the theological point of view. (Perez 119)

Zaragoza, as a theologian, close confidant of Prince Charles II of Spain and a man educated in the sciences was a natural candidate for such a position. His position as a *Calificador* was unsalaried but came with immense privileges. A few of these included the right to carry arms, the right to be tried only at an inquisitorial court, exclusion from certain taxes, and the privilege to print his works (Perez 123-125). He also had the benefit of being able to censor his own works and had the ability to seek out immediate licensing and relatively prompt printing, which was rare at the time. It allowed him to bypass the years-long wait most other authors faced. It is unknown what Zaragoza's stance was regarding other academics, but an uncredited writing by a Spanish priest showcased disdain in the censorship of scientific and mathematical materials: "In principle, there was no reason why the Inquisition should ban scientific books for, as Father Mersenne [in France] pointed out in 1625, it is perfectly possible to be at the same time a good Catholic and a good mathematician" (Perez 187). As a result of the censorship of sciences, literature, and many other subjects and publications, Spain was not able to take part in the scientific revolution of the seventeenth century with the rest of Europe. Eduardo Gallart (Active 1991-present), a modern Spanish mathematician, who wrote his dissertation on Joseph Zaragoza's works,

also wrote “Geometrical studies in 17th century Spain and their counterparts in European mathematics.” Gallart, in the above-mentioned paper, made the succinct summary of the mathematical landscape Zaragoza was living in: “Mathematics in Spain during the 16th and 17th centuries are mainly of the applied and instrumental kind ... and therefore most of the books written were intended for teaching basic arithmetic, Euclid’s *Elements*, commercial calculus, the first rules of algebra, trigonometry, and logarithms” (695).

From Zaragoza’s work such as a Latin primer of problems on Euclid (1669), as well as Spanish and Latin translations of Euclid’s *Elements* (1678), it’s apparent that classical geometry was a focal point of his works. In the work that is translated below, Zaragoza’s *Trigonometria Española, Resolucion De Los Triangulos Planos, Y esphericos, Fabrica, y uso de los Senos, y Logarithmos (Trigonometria Espanola)*, which will be referred to as TE, the useful nature of the book is obvious. It is a small, velum, bound book with linen pages, crafted to be sturdy and easily accessible, with all copper engraved images on foldable sheets. The purpose of this book was to allow astronomers, military men, and seafarers to understand geometry and to be able to make quick and precise calculations. The book also provided the first table of logarithmic computations published in Spain (Bordas 393). works being delayed in the approval process (Perez 119).

Zaragoza produced editions of TE in Spanish and Latin, but there has yet to be a full translation of any of his works into English. The portions below are translated from the Spanish Edition of TE. In his works, there are references to Euclid’s *Elements*, which he calls upon to justify his theorems. Zaragoza references Euclid’s *Elements* in the format, for example, (2.I.6), in which the center I stands for the Spanish word libro (book). Thus, this reference reads: Proposition 2, Book 6, Euclid’s *Elements*. When necessary, the proposition in the reference will be paraphrased. He also includes references to his own work which will be noted. When Zaragoza mentions lines, he is referencing line segments. The explications below are translated by Mr. Néstor Stánislao Nava-Ocampo from Chapter II, Book II, of Zaragoza’s TE. Comments in [square brackets] are my notes and commentary on the translation, and all figures are mine.

(57)

LIBRO SEGUNDO DE LA TRIGONOMETRIA PLANA.

BOOK TWO

OF PLANE TRIGONOMETRY

Plane trigonometry is a science of measure, and revolves [around] Rectilinear Plane Triangles. A Rectilinear Plane Triangle is one that forms in a flat surface plane with straight lines. The Triangle, then, that forms in a flat surface plane with three Arcs of a circle, or with whatever three curved lines, and is also called a Plane Triangle, is not an object of Plane Trigonometry, because it is not rectilinear and does not form with three straight lines.

(59-60)

...
CHAPTER II.

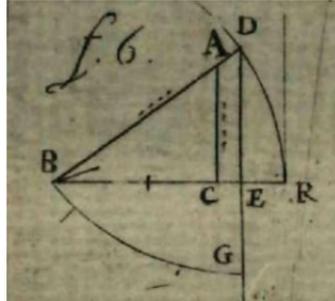
DEMONSTRATIONS OF PLANE TRIGONOMETRY.

8. In a rectangular [right] Triangle the side opposite to the Right Angle is said to be the Hypotenuse, and the others called Base.

DEMONSTRATION I.

In a rectangular [right] Triangle the Hypotenuse has to the sides the ratio that the Radius [of circle DR] has to the Sines of the opposite angles.

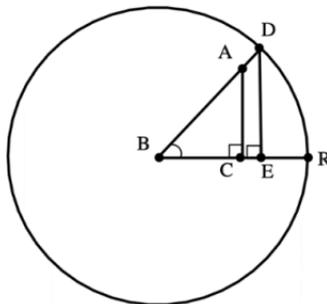
Fig. 6.



[Zaragozá's figure 6 which we construct below]

[Proof]

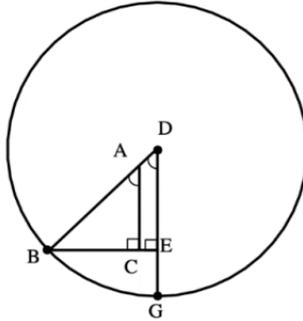
Let there be a Triangle ABC; with the center B, describe any circle DR, continuing [line segment BA to] BAD and [line segment BC to] BCR and throw the perpendicular DE [from D to BCR];



it [DE] will be Sine of Angle B, (lib. I.§.8.) [Zaragozá, book one section 8. Here the "Sine of Angle B" is the half-chord definition DE of a "right Sine" and because the Angles C, E are right, CA, DE will be parallel (2.1.1) [corrected to either (27.1.1.) or (28.1.1.)] then the triangles BCA, BED are similar and the sides proportional (2.1.6) so the Hypotenuse BA, to the side AC, is in the same ratio as the radius BD, to the Sine DE, that is Sine of the opposite Angle B.

$$\left[\frac{\text{Hypotenuse}}{\text{Side Opposite } B} = \frac{BA}{AC} = \frac{BD}{DE} = \frac{\text{Radius}}{\text{Sine of Angle } B} \right]$$

Also, from Angle D, describe Circle BG.



The hypotenuse AB, to the side BC has the ratio that the Radius BD [has] to the Sine BE of Angle D opposite that is equal to Angle A. [Angle D = Angle A.] Then the Hypotenuse to any side has the ratio, as the Radius to the Sine of the opposite Angle:

$$\left[\text{by algebra, } \frac{\text{Hypotenuse}}{\text{Side opposite } A} = \frac{AB}{BC} = \frac{BD}{BE} = \frac{\text{Radius}}{\text{Sine of Angle } D (= A)} \right]$$

and alternately the Hypotenuse to the Radius has the ratio side to the Sine of the opposite Angle $\left[\frac{\text{Hypotenuse}}{\text{Radius}} = \frac{\text{Side opposite } A}{\text{Sine of angle } A} \right]$ and also inverted $\left[\frac{\text{Radius}}{\text{Hypotenuse}} = \frac{\text{Sine of angle } A}{\text{Side opposite } A} \right]$. The Radius to the hypotenuse, has the ratio Sine of the Angle to the opposite side, &c. (4.1.5.)]

[End of Proof]

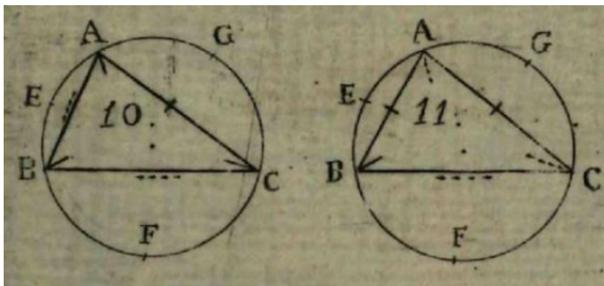
The importance of applied mathematics in Spain during the seventeenth century is visible from these geometric proofs. This work would have been important to sea-faring men, military personal, and merchants to utilize in their daily lives. These proofs are not revolutionary mathematical theories, like other works at this same time, but they show an original point of view at which to format, attack geometric proofs, and think about this type of mathematics in a useful way. This provides evidence that there was both work of substance and use being written and distributed in Spain during the seventeenth century but at a more limited capacity. It also provides evidence of academic excellence in Spain, as this required people in the Iberian Peninsula to have a familiarity with Euclid's Elements to utilize Zaragoza's works and other forms of complex mathematics. The following demonstrations provide a further look into the distribution of mathematics in seventeenth century Spain, Demonstration dII. [III], proving the sides of any triangle are proportional with the sines of the opposite angle, was necessary for navigation, nautical astronomy, architecture, and many other uses that would be advantageous for the financial interests of the Spanish Crown.

(60-61)

DEMONSTRATION dII. [III]

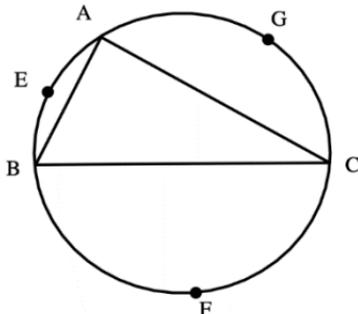
10 *In any triangle the sides are proportional with the Sines of the opposite Angles, and the converse.*

Figs. 10, 11.



[Zaragoza's figures 10 and 11 which we construct below]

[Proof] Let there be any triangle ABC, describe a circle by the three angles (4. Prob. De mi *Geometrica Practica*) [This must be the standard construction of the circumscribed circle of triangle ABC (5.l.4.). The idea is, bisect, say, sides AC and AB with perpendicular lines. Where those lines meet is the center of the circle circumscribing triangle ABC] and split in half the Arcs in [at] E, F, G.

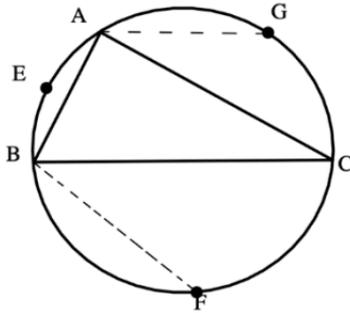


Because the Angles in the circumference are half of the opposite Arcs (3.l.3.) [corrected to (20.l.3)] [Arc] EB will be, the measurement of Angle C, and [Arc] BF, of Angle A, and [Arc]

G, of Angle B, and the Sine of EB, will be Sine of Angle C, and [the Sine] of AG, [the Sine] of Angle B, &c. Chord AB to, the chord AC, has the ratio as that of Sine of EB, to Sine of AG (lib. 1. §. 17.) ["The sine of any arch is half a chord of the Double Arch, and the Sines of two Arches are proportional

to the chords of the Double Arches."] $\left[\frac{\text{Chord } AB}{\text{Chord } AC} = \frac{\frac{1}{2}\text{Chord } AB}{\frac{1}{2}\text{Chord } AC} = \frac{\text{Sine of Arc } EB}{\text{Sine of Arc } AG} = \right.$

$\left. \frac{\text{Sine of Angle } C}{\text{Sine of Angle } B} \right]$



[Side] BA will be, with [side] AC, the ratio that Sine of Angle C, with Sine of Angle B, and that way [side] AB, with [side] BC, the ratio, the Sine of C, with the Sine of A:

$$\left[\frac{\text{Side } BA}{\text{Side } AC} = \frac{\text{Sine of Angle } C}{\text{Sine of Angle } B} \text{ and } \frac{\text{Side } AB}{\text{Side } BC} = \frac{\text{Sine of Angle } C}{\text{Sine of Angle } A} \right] \text{ and alternate, and}$$

inverted, &c. (4.1.5)

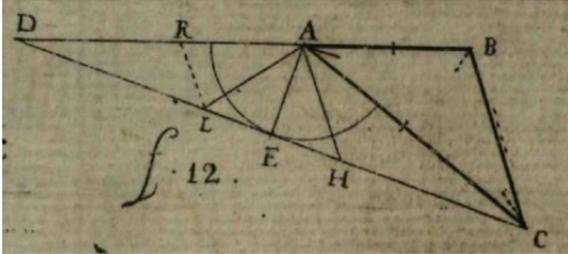
[End of Proof.]

...

(61-62)

DEMONSTRATION IV.

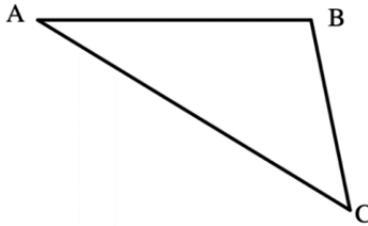
11. *In any Triangle the sum of two sides to their difference, has the ratio that the Tangents of the semi-sum of the Angles opposite to the Tangents to the semi-difference of the same.* Fig. 12



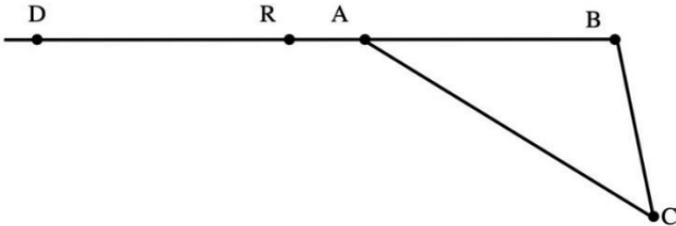
[Zaragoza's figure 12 which we construct below]

[Proof]

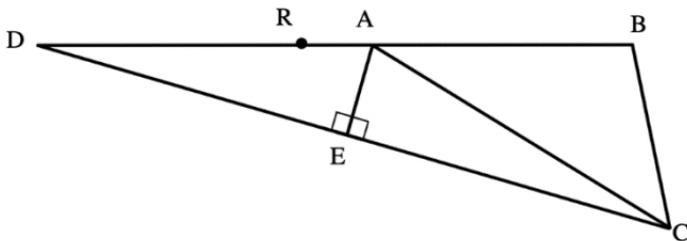
Let there be a Triangle ABC;



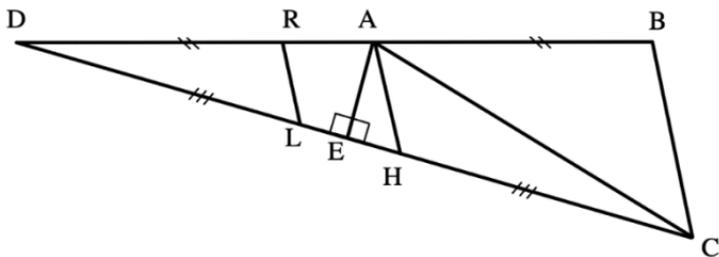
continue BAD such that AD, AC, and also DR, AB, are the same [AD = Side AC and DR = Side AB], and it will be DB, the sum of the sides, and RA, their difference,



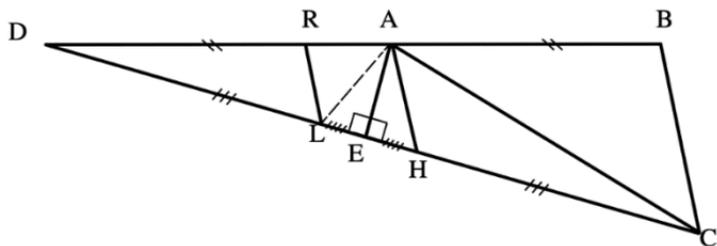
[$DB = AD + AB = \text{Side AC} + \text{Side AB}$ and $RA = AD - DR = \text{Side AC} - \text{Side AB}$.]
 and joining DC, and AE, its perpendicular [of the isosceles triangle DAC
 where $AD = AC$] will split equally the base DC [$DE = EC$], and [bisect] the
 Angle DAC (5.1.1.) [and (4.1.1.)]



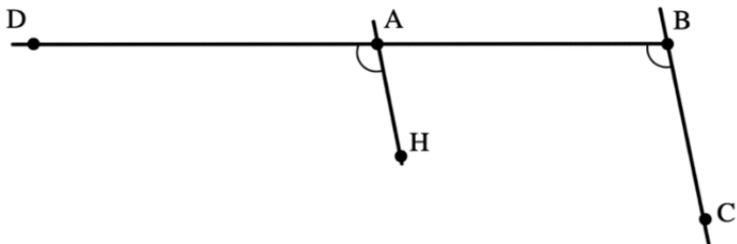
and because DAC, is the sum of the Angle B, and C (3.1.1.) [corrected to
 (32.1.1.); DAC is an exterior angle to triangle ABC hence $DAC = B + C$.] EAC
 will be, the semi-sum [$EAC = \frac{1}{2} * DAC = \frac{1}{2} (B + C)$.]: Distances RL, AH,
 [drawn] parallel to BC,



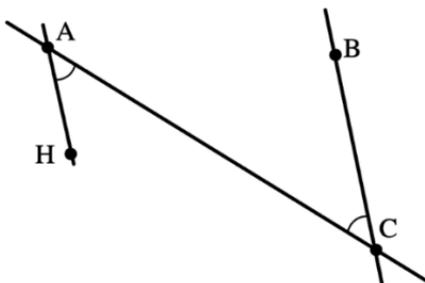
as BA, [is] equal [to] RD, will cause CH, [to be] equal to LD, (2.1.6.) [CH = LD] then leaves LE, EH, equal (4.P.) [paragraph 4 from Chapter II, Book II] [LE = DE - LD = EC - CH = EH.]



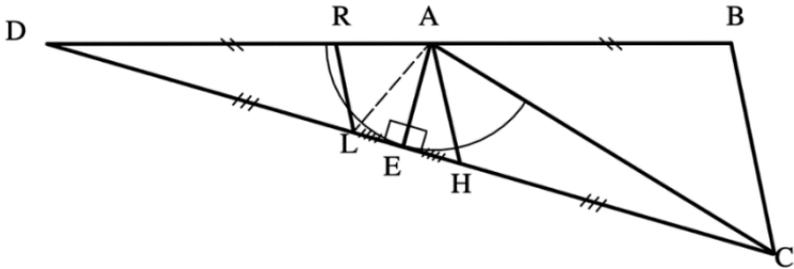
and the Angles EAL, EAH [equal, since right triangle LEA is congruent to right triangle HEA by (4.1.1.), "side-angle-side" congruence.], and also [angles] LAD, HAC [equal] [LAD = EAD - EAL = EAC - EAH = HAC], (5.1.1.) and LAH, is [the] difference of the Angles DAH, HAC, that are B, [Angle DAH = Angle B]



and C [Angle HAC = Angle C]



(2.1.1.) [corrected to (29.1.1.)] by the parallels AH, BC: later [angle] EAH, is semi-difference of Angles B, and C [$EAH = \frac{1}{2}LAH = \frac{1}{2}(DAH - DAL) = \frac{1}{2}(B - HAC) = \frac{1}{2}(B - C)$]. Describe a circle with Radius AE [and center A],



so EC is Tangent [according to his definition Book I, Chapter 1, Section 17] of the semi-sum EAC and EH, is Tangent of the semi-difference EAH [= $\frac{1}{2}(B - C)$], and parallels LR, HA, CB, are proportional DB, to RA, such as DC, to LH, (2.1.6.) and also such as DC, to LH, so [the] half EC, to the half EH, (5.1.5.) later by I.1.5. are proportional. [$\frac{DB}{RA} = \frac{DC}{LH} = \frac{2 \cdot EC}{2 \cdot EH} = \frac{EC}{EH}$]

- So BD. Sum of the sides CA, and AB.
- is to RA. Difference of the same sides.
- So EC. Tangent of the Semi-sum of the Angles B,C.
- is to EH. Tangent of the Semi-difference of the same.

[End of Proof]

Corollary

12. Later, consider the semi-sum, and semi-difference; if the semi-sum DAE [= $\frac{1}{2}DAC = \frac{1}{2}(B + C)$], is added to the semi-difference EAH [= $\frac{1}{2}(B - C)$], there will result that the major Angle DAH, [is] equal to B; but if from the semi-sum EAC [= $DAE = \frac{1}{2}(B + C)$], the semi-difference EAH is subtracted, Minor Angle HAC will be left, equal to C, [$EAC - EAH = HAC =$

C] and to the contrary added the semi-difference EAH, the minor part HAC, will result [in] the semi-sum CAE, [$EAH + HAC = CAE = \frac{1}{2}(B + C)$] and this is general for all quantities.

"In the sixteenth century, it [Spain] had been mainly preoccupied with practical applications of science: for example, how to perfect nautical instruments that would make it possible to calculate longitude and latitude more accurately." (Perez 189)

Because Zaragozá was a Jesuit Priest and *calificador*, he provided works that would be beneficial to the Spanish Crown. His demonstrations in plane Trigonometry were viewed as paramount for consistent trade and travel. From the demonstrations above, he provided precise ways to verify congruent and opposite angles, diameter of circles, and other necessary trigonometry work that would have been used in navigation, astronomy, engineering, and artillery range ("Geometrical studies in 17th Century Spain and their counterparts in European mathematics 695).

A forward by D. Antonio de la Zerda (1638-1692) outlines the usefulness of TE and it's benefit to Charles II, the king of Spain:

"For Military Architecture to show your Excellency... the new defenses of moats, the singular disposition of prisons... It can say much of Navigation, in which it has beaten the industry of your Excellency... The Geographic Tables, descriptive of the Sea and the Earth..." (Trigonometria Espanola iii)

Zerda highlights TE's usefulness for military, navigation, and geography which provides further evidence of Spain's dedication to applied sciences.

Zaragozá's dependency on Euclid's Elements, in TE and all his other publications, showcases the importance of classical geometry, and that popular mathematics at the time required geometric proofs to be considered valid. Although Spain was stunted in comparison to other European nations regarding the scientific revolution and pure mathematics, Zaragozá's work held similarities with other famous scholars during the seventeenth century. Gallart explains:

The topics of pure geometry covered by the geometers of the Imperial College were also dealt with by other European

mathematicians such as Fermat [France], Huygens [Netherlands], Tacquet [Dutch Republic], Viviani [Italy], Borelli [Italy], Ceva [Italy] and many others. In chronological order, the most important [Spanish] geometers of the period were Claude Richard, Jean Charles de La Faille, Jose Zaragozá, Hugo de Omerique and Jacobo Kresa." ("Geometrical studies in 17th Century Spain and their counterparts in European mathematics" 695)

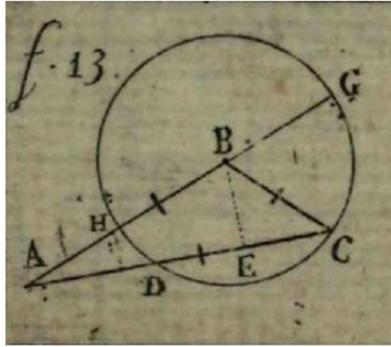
Although the roster of significant Spanish scientific minds of the seventeenth century remains short due to the restraints imposed by the Holy Office's censorship and prohibitions on publications, as more works are translated, explicated, and disseminated, the list is poised to expand. Zaragozá, who was forgotten until the 1930's, has been recently celebrated for his inventiveness with Euclidian geometry and astronomy ("Geometrical studies in 17th Century Spain and their counterparts in European mathematics" 287). Bordas contends "Zaragozá's greatest contributions, however, were in the field of geometry and astronomy. His thinking in the former was highly original, in some ways anticipated the work of Giovanni Ceva, although it was not known outside Spain" (395).

Below is a continuation of the explication and translation of TE, revealing his inventiveness in geometry. The demonstration provides a proof to show that the base of a triangle, divided by the sum of its sides, will be equal to the difference of the triangle's sides divided by the difference of the line segments of the base.

(61-62)

DEMONSTRATION V.

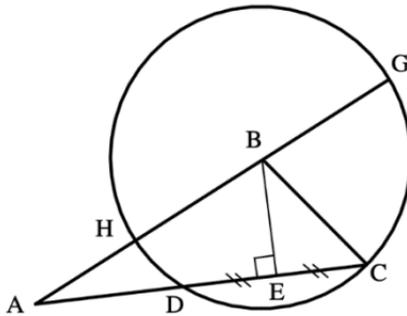
13 *In any triangle the ratio of the sum of the Base to the sides is that of the difference of the sides to the difference of the segments the perpendicular makes to the base. Fig. 13.*



[Zaragozá's figure 13 which we construct below]

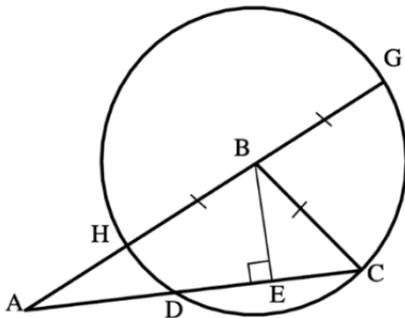
[Proof]

Let there be Triangle ABC, the base, or major [longest] side CA, the perpendicular BE, with the Radius BC, which is the minor [smallest] side, describe a circle, and continue AB, until G [on the circle],



because BG, BC, are equal [BG = BC as radii], it will be ABG, sum of the sides AB, BC

$$[ABG = AB + BG = AB + BC],$$



and because the perpendicular BE, splits equally the chord CD, (2.1.3.) [corrected to (3.1.3.)] being equal CE, ED [CE = ED], DA will be the difference of the segments CE, EA [EA - CE = EA - ED = DA], and for being equal BC, BH [BC = BH as radii], is HA, difference of the sides CB, BA [BA - CB = BA - BH = HA].

Because the Secants AG, AC, reciprocals with their exterior segments [AG · HA = AC · DA so, $\frac{HA}{DA} = \frac{AC}{AG}$] (6.1.6.) [corrected to (36.1.6.)] are proportional

$$\left[\frac{\text{Hypotenuse}}{\text{adjacent side}} = \frac{AG}{AC} = 1 \right]$$

So AC. Base, or major side.

is to GA. Which is the sum of the sides.

So HA. Which is the difference of the sides.

is to DA. Difference of the segments of the base.

$$\left[\frac{\text{Base}}{\text{Sum of the Sides}} = \frac{AC}{GA} = \frac{HA}{DA} = \frac{\text{Difference of the Sides}}{\text{Difference of the Segments of the Base}} \right]$$

[End of Proof]

The Spanish Inquisition's control over the Iberian Peninsula resulted in a suppression of productivity in arts, culture, and sciences. Specifically, mathematical advances were harshly censored, as many brilliant minds of the time were listed on the Index, meaning their works were not able to be published. Zaragozá was one of the lucky few who was both highly educated and a member of the Holy Office. His special position as a scholar and qualifier allowed him to censor the works of other scholars, while receiving immediate licensing for his own works. Besides the work translated within, there are no other translations of Zaragozá's works into English. His most notable publications are in Latin, as they were intended only for the educated or those of religious office to utilize. With his exclusive publishing rights and sponsorship from the Crown his works on Euclid and Trigonometry was one of few Spanish mathematical treatises readily available. Thus, these portions of translation from TE emphasize both the importance of applied sciences during the seventeenth-century and the continued reliance on Euclidian geometry.

The Inquisition is not the sole reason Spain's scientific revolution was stunted in comparison to the rest of Europe, but it played a vital role with its censorship and vilifying of academics in scientific fields. Spain would not see a semblance of scientific revolution until later in the nineteenth century, nearly two hundred years after the majority of Europe. In 1834, the Spanish Inquisition was finally ended ushering in many new advances for Spain in mathematics and other sciences (Anderson).

I'd like to thank Mr. Néstor Stánislao Nava-Ocampo for assistance in translating these and other portions of Zaragozá's TE.

Works Cited

- Anderson, M. James. *Daily Life During the Spanish Inquisition*. Greenwood Press, 2002.
- Bordas, Cristina, et al. *Early Music*, Vol. 26, No. 3. Oxford University Press, 1998.
- Gallart, Eduard Recasens "Geometrical studies in 17th Century Spain and their counterparts in European mathematics, The Global and the Local: The History of Science and the Cultural Integration of Europe." Proceedings of the 2nd ICESHS (Cracow, Poland, September 6-9, 2006), 2006.
- . 'J. Zaragosa's Centrum Minimum, an Early Version of Barycentric Geometry.' Springer, 1994.
- Hauben, J. Paul *The Spanish Inquisition A Crucible of National Values*. John Wiley & Sons, 1969.
- Kamen, Henry. *The Spanish Inquisition: A Historical Revision*. Yale University Press, 1997.
- Karp, Alexander and Gert Schubring. *Handbook on the History of Mathematics Education*. Springer, 2014.
- School of Mathematics and Statistics University of St. Andrew, Scotland, 2022.
- Navarro-Loidi, Juan and Jose Llombart. 'The introduction of logarithms into Spain. *Historia Mathematica*, 2008.
- O'Callaghan, F. Joseph. *A History of Medieval Spain*. Cornell University Press, 1975.
- Perez, Joseph. *The Spanish Inquisition*. Yale University Press, 2004.
- Zaragozá, J. *Arithmetica Universal que Conprehende el Arte Menor, y Major, Algebra Vulgar, y Especiosa*. Valencia, Geronimo, 1669.
- . *Esphera en Comun Celeste, y Terraquea*. Madrid, Juan Martin del Barrio, 1671.
- . *Euclides Nuevo-Antiquuo. Geometria Especulativa, Y Practica De Los Planos, Y Solidos*. Madrid, Antonio Francisco de Zafra, 1678.
- . *Geometria Especulativa, y Practica de los Planos, y Solidos*. Valencia, Geronimo Villagrassa, 1672.
- . *Geometria Magna in Minimis*. Toledo, F. Calvo, 1674.

Zaragozá, J. (1672). *Trigonometria Española, Resolucion de los Triangulos Planos Esfericos. Fabrica y uso de los Senos y Logaritmos.*
Mallorca, Francisco Oliver

Humanities

The Problem with International Social Contracts

Catherine Abbott

Simply put, the most powerful state is the one that prevails in a dispute.

--Mearsheimer, 2001

An alliance fundamentally involves two or more actors, states, institutions, or parties agreeing to coordinate their actions, signifying a commitment to future collaboration (Morrow, 1991). Morrow (1994) aptly notes, "Alliances are promises, but as every 6-year-old knows, adults often break their promises" (p. 270). Although these commitments lack legal enforceability, given the anarchic nature of the state system, alliances primarily serve as signals to other parties, notably fellow states, signifying shared interests and a greater likelihood of future coordination (Morrow, 1994). These agreements essentially function as global indicators of international social contracts, taking various forms such as military, economic, and political alliances. States formalize these pacts to communicate their dedication and adherence to these arrangements, often involving engagement with a neutral arbiter like liberal institutions, intergovernmental organizations (IGOs), or non-governmental organizations (NGOs) (Morrow, 2000).

This paper examines diplomatic documents that provide security assurance, including non-aggression pacts, military alliances, and other protocols. While not primarily identified as military or offensive alliances, these agreements have peripheral effects aimed at maintaining sovereignty and state integrity, serving as deterrents to potential aggressors, such as the United Nations Charter (UN). The aim is to determine how conflict, as a variable, influences the adherence of powerful states to international social contracts and whether external pressures from respective IGOs enforce compliance on either weak or strong states. The foundation of the study is defined by seventeenth-century English philosopher Thomas Hobbes' social contract theory, providing a framework to ascertain the specific conditions governing state compliance with international agreements. I argue states possessing

significant strength are more inclined to display lower levels of adherence or compliance with international social contracts than weaker states. This inclination stems from the anarchic nature of the global environment, coupled with the inherent limitations of IGOs in compelling strong states to enforce compliance. I support my claim using the 2014 Annexation of Crimea and the 2022 Russo-Ukrainian War as case studies to analyze whether strong states comply with international social contracts.

According to Hobbes (1984), social contracts entail individuals surrendering some personal liberties in exchange for safety assurance within a higher form of governance. This idea depends upon individual's willingness to relinquish certain freedoms to escape the state of nature, ultimately securing their safety through power transfer. Hobbes (1984) portrays the state of nature as a hypothetical condition in political philosophy in which human interaction occurs without established institutions. In this scenario, he argues humans are in perpetual competition, driven by a natural inclination to dominate for personal gain and survival. Hobbes (1984) vividly describes those in the state of nature as "[s]olitary, poor, nasty, brutish, and short," emphasizing the inherently chaotic nature of such a society (p. 64). To overcome this anarchy, individuals must enter covenants or social contracts, thereby establishing legal institutions and enforceable statutes that provide protection and security, albeit at the cost of relinquishing certain personal freedoms to a centralized government.

International Agreements, State Dynamics, and Power Balance

International agreements form the basis of global collaboration and interdependence among member states to mitigate conflict, promote global prosperity, and provide states with benefits such as security assurances, economic growth, and strengthening political legitimacy. To seek membership into such arrangements, such as Hobbesian social contract theory, states must provide various forms of payment ranging from mandatory financial contributions to voluntarily relinquishing arms proliferation, all dependent on the type of agreements and obligations required from prospective states (Moehler, 2018). Strong states are characterized by centralized authority, effective governance, limited societal influence on policy, robust economic standing, and significant global influence, including the ability to enforce policy concessions,

particularly over weaker states (Oatley, 2019). However, weak states have decentralized authority, poor economic coordination, multiple channels for domestic interests to influence policies, and need more political sway on the global stage (Oatley, 2019). In international relations, state strength is pivotal for exercising power, defined as the capacity to compel compliance from states, regardless of their willingness (Morgenthau, 2018). This power or influence extends to treaty facilitation, safeguarding personal interests, advocating for global values, and shaping political interactions. Given the role of power dynamics in the international system, treaties, global protocols, agreements, coalitions, or conventions safeguard the balance of power between strong and weak states.

Adherence to such international social contracts demonstrates a commitment to and the authority to global interdependence, promoting diplomatic relations among states and legitimizing the authority and credibility of international agreements and, by extension, institutions. According to Hobbes (1984), these covenants, in theory, are frameworks prohibiting strong states from abusing political influence or power and serve as an instrument for mutual and reciprocal benefits for allies. Given their vulnerability, weak states often seek alliances with stronger counterparts for support and resources. On the other hand, strong states seek coalitions with weaker ones to exert soft power, bolstering their credibility and sometimes leveraging policy concessions (Lanoszka, 2022). However, the introduction of an independent variable, like conflict, alters the dynamics of state compliance. Weak states, reliant on resources from alliances with stronger counterparts, adhere to social contracts even during conflicts, expecting reciprocation. Strong states, on the other hand, are more prone to violating agreements with weaker counterparts.

According to Hobbes (1984), in the state of nature, conflict arises from two main factors: diffidence, a lack of trust or confidence in others because of the absence of an established authority or governing body, and competition, driven by scarcity of resources, causing individuals to compete for their needs and desires. This competition ultimately results in conflicts and tensions as they strive to secure their survival and well-being (Hobbes, 1984). Given this environment, individuals will prioritize self-security and self-preservation over collective goods and benefits, necessitating a concentrated governing body. Instead, intergovernmental organizations (IGOs) and liberal institutions like the UN are proxies,

promoting interdependence and deterrence among member states. Strong and weak states join these institutions for mutual benefits, including economic, political, and security advantages. While these proxy entities can enforce compliance on weaker states through measures such as economic sanctions or the prospect of collective action, the global influence of strong states can override IGO enforcement capabilities, especially during conflict (“7 Reasons,” n.d.; Mearsheimer 1994). The UN depends on Member States’ voluntary contributions for funding and military personnel, making its operations and legitimacy contingent on their compliance. IGOs face limitations in enforcing compliance with strong states contributing more financially or providing military personnel. This concentration of power is evident within the UN Security Council, the branch responsible for upholding global safeguards through measures like sanctions, conflict resolutions, and the authorization of force (United Nations, 1945). The council is composed of five permanent members—the United States, France, the United Kingdom, China, and Russia—all of which have veto power over all security council decisions (“7 Reasons Why The United Nations is Bad for the World,” n.d.; United Nations, 1945). As Lanoszka (2022) noted, states often join alliances or IGOs to deter hegemonies or strong states; however, during times of conflict, these institutions may struggle to exert control over relatively powerful states. The power imbalance between strong and weak states illustrates the influence of strong states surpasses institutional force in the international system. Instead, compliance is primarily based on voluntary adherence, especially for strong states.

When states join international agreements, they do so with the expectation of receiving reciprocal benefits. To enter into such agreements, they must often adhere to specific preemptive requirements, which may include policy concessions. For instance, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), is an international treaty prohibiting the development of nuclear arms (United Nations Office for Disarmament Affairs, n.d.). Under this treaty, nuclear-armed states, which, according to the Treaty, are allotted to keep their arsenals, such as the US, the United Kingdom, Russia, China, and France, are committed to providing security assurances and refraining from threatening or attacking other states using their nuclear arms as a mechanism for force (United Nations Office for Disarmament Affairs, n.d.). This Treaty signifies a global

commitment to disarmament; notably, the states allowed to maintain their nuclear arsenals are typically strong states with veto power in the UN Security Council. In contrast, weaker states must disarm and render themselves subordinate to the assumed security of strong states. However, strong states may exploit agreements by requiring policy concessions or using ambiguous language to evade commitments with weak states (Lanoszka, 2022). Maintaining a certain level of military capacity is crucial for deterrence and ensuring security in the anarchic international system, as unilateral disarmament or significant reductions in military capabilities may signal weakness, potentially increasing vulnerability to coercion or attack (Waltz, 2010).

The North Atlantic Treaty Organization (NATO) is an offensive military alliance offering signatories democratic principles, participation in a global market economy, and security guarantees, aiming to maintain international peace and security. Central to NATO is Article V, ensuring an attack on one member is considered an attack on all, compelling collective action (NATO, 2023). However, Article VI introduces some ambiguity, stating there is no automatic obligation for specific actions, allowing members some discretion in providing support (Lanoszka, 2022). In international affairs, full participation is crucial, and anything less risks undermining the stipulations outlined in international agreements or intergovernmental organizations (IGO), potentially leading to mistrust, volatility, and instability on the international stage (Rousseau, 1990).

Discussion: A Comparative Analysis of Compliance

State	Agreement	Relative State Strength	Aggressor	Conflict	Compliance
Germany	Molotov-Ribbentrop Pact (1939)	Strong	Yes	Yes	No
Russia	Molotov-Ribbentrop Pact (1939)	Weak	No	Yes	Yes
Russia	Soviet-Japanese Neutrality Pact (1941)	Strong	Yes	Yes	No
Japan	Soviet-Japanese Neutrality Pact (1941)	Weak	No	Yes	Yes
Iraq	UN Charter (1945)	Strong	Yes	Yes	No
Iran	UN Charter (1945)	Weak	No	Yes	Yes
Iraq	UN Charter (1945)	Strong	Yes	Yes	No
Kuwait	UN Charter (1945)	Weak	No	Yes	Yes
United States	UN Charter (1945)	Strong	Yes	Yes	No
Iraq	UN Charter (1945)	Weak	No	Yes	Yes
Russia	Warsaw Pact (1968)	Strong	Yes	Yes	No
Czechoslovakia	Warsaw Pact (1968)	Weak	No	Yes	Yes

Table 1. (Gause, 2002; Greenwood, 1991; Hara, 2004; MacAskill & Borger, 2004; "Soviet Invasion of Czechoslovakia, 1968," n.d.; Reynolds, 1949).

Table 1 demonstrates recognizable agreements between states, considering their relative strengths, conflict, and compliance. These

agreements primarily serve as diplomatic documents offering security assurances, including provisions like non-aggression pacts and alliances. While not exclusively military, they include stipulations to deter potential aggressors, like the UN Charter. The UN Charter is a multilateral agreement defined by liberal institutionalism, wherein interdependence and cooperation among states deter potential adversaries (United Nations 1945). Article 2, subsection 4 of the Charter explicitly prohibits using force or threats in international relations (United Nations, 1945). Attempts to circumvent these stipulations will result in collective action from the international community, including economic sanctions and UN Security Council resolutions (United Nations, 1945). The Council can call upon Member States to use force when authorized by the Council, as noted in Article 51 of the UN Charter (United Nations, 1945).

In this context, it is crucial to note I am evaluating a state's relative strength between contracting parties, for example, the 1939 Molotov-Ribbentrop Pact between Germany and the Soviet Union, i.e., Russia. Despite the assumption both states have equivalent standing, Germany, at the time, had stronger military strength and economic growth when compared to the Soviet Union, given its ideology of political isolation contributed to its less influential standing on the global stage (Roberts, 1992). This evaluation of Germany only pertains to its relative strength compared to Russia; it does not extend to its relative strength to the broader international community (Roberts, 1992). Additionally, the table's evaluation focuses exclusively on contracting or agreeing parties and the behavior of strong states when introduced with the independent variable, conflict. It also indicates which party acted as the aggressor, suggesting strong states fail to adhere to a given contract and often instigate conflicts. The table does not distinguish tensions, reasons, or stipulations that led to the strong state's violation of the agreement, nor does it address the subsequent efforts by the international community. Instead, it underscores that strong states do not uphold international social contracts to the same extent as weak states; this tendency could be attributed to various factors, such as the inability of weak states to counteract strong states militarily, rendering the violation of an agreement infeasible. Conversely, strong states possessing the capacity to exert force may use this as a justification for disregarding such agreements.

Russia's Compliance with International Agreements and Ukraine

Following the dissolution of the Soviet Union in 1991, Ukraine inherited the world's third-largest stockpile of nuclear warheads upon gaining independence (Umland, 2016). While this inheritance enhanced its global military position, Ukraine faced substantial difficulties maintaining its sovereignty, given its economic dependency and lack of international recognition. In 1994, the Budapest Memorandum provided security assurances, with signatories, including the US and the United Kingdom, reaffirming their commitment to the 1945 UN Charter and the 1975 Security and Cooperation in Europe (CSCE) Helsinki Final Act—a diplomatic accord aimed at enhancing relations between Eastern and Western blocs during the Cold War, emphasizing the importance of territorial integrity, economic cooperation, and respect for human rights (Yost, 2015). The Memorandum offered Ukraine guarantees, particularly safeguarding its sovereignty and independence, in exchange for its decision to relinquish its Soviet-era nuclear arsenal and comply with the NPT, a seemingly small price to display international cooperation and an assertion of political legitimacy (Yost, 2015). However, in 2014, Russia violated the Budapest Memorandum, the UN Charter, and the Helsinki Final act by unlawfully annexing Crimea.

The 2014 annexation of Crimea demonstrated the power disparity between Russia and Ukraine; how strong signatories of the Memorandum, the UN Charter, and the Helsinki Accords responded when introduced with conflict; and the compliance of weak states when introduced with the same conflict. In general, Russia, while not officially recognized as a hegemonic power, exerts significant global influence given its position in the UN Security Council, acting as a stabilizing force within the Eastern bloc; this influence is further substantiated by its military capabilities and economic dominance, particularly in its control over the Serbian oil industry. In contrast, Ukraine grappled with domestic political volatility and corruption, resulting in limited to negligible international power and a notably weaker military presence (Wilson, 2015).

The international community's response was multifaceted, with former US President Barack Obama and German Chancellor Angela Merkel condemning Russia's actions; however, their reaction did not

involve direct military intervention. Instead, the United States imposed economic sanctions, while Germany maintained trade relations with Russia, particularly for Serbian Oil (Alexander, 2014; National Archives, 2014; Policy Statement, 2014; Speck, 2016; Volker, 2014). Notably, influential signatories such as the US, the United Kingdom, and France, that had reaffirmed their commitment to the Budapest Memorandum, UN Charter, and Helsinki Accords, still needed to provide Ukraine with the security assurance they had promised. When introduced to conflict, these strong states failed to take decisive security measures and delegitimize international agreements built on collective action. Additionally, given Russia's influence within the UN Security Council, the United Nations could not mediate effectively, as Russia, a permanent member, wielded its veto power, highlighting the challenge and limitations faced by IGOs in enforcing agreements or pacifying strong states accountable when they seek to violate international agreements with weaker counterparts (Chappell, 2014). Over time, Ukraine upheld its compliance, including disarming itself, operating under the assumption of collective security during conflict; yet the international community's commitment to social contracts demonstrated the disjointed effort between powerful states and the weaker state, Ukraine.

Ukraine's Security Dilemma and NATO Member States

Given its political circumstances, Ukraine found NATO membership appealing as it offered an added layer of deterrence against potential adversaries and facilitated deeper integration with Europe. Joining NATO would also bring a range of advantages for Ukraine, such as projecting stability to investors and potential trade partners, thus drawing foreign investment and expanding Ukraine's presence on the global stage.

Since 2002, Ukraine has shown a keen interest in NATO. After the 2008 Bucharest Summit, where allies confirmed Ukraine's eventual NATO membership, the country actively sought collective security by adhering to the Membership Action Plan (MAP) ("Relations with Ukraine," 2023). The MAP is a comprehensive framework wherein states adopt policies aligned with NATO requirements for membership consideration, including implementing political, economic, defensive, resource, and security reforms ("Relations with Ukraine," 2023). Following the 2014 annexation of Crimea, Ukraine garnered political and practical support from NATO

members. Despite not officially obtaining membership, Ukraine remained steadfast in its commitment to joining NATO. In 2017, Ukraine's Parliament passed ordinances declaring NATO membership as a strategic goal, underscoring the country's dedication to Euro-Atlantic integration (Interfax-Ukraine,2017). Over the years, NATO consistently confirmed its support and emphasized the significance of Ukraine's reforms in the context of its Euro-Atlantic integration process.

In February 2022, Russia again violated Ukraine's sovereignty by invading the country, contradicting critical international agreements including the 1994 Budapest Memorandum, the 1945 UN Charter, and the 1975 Helsinki Final Act (Center for Preventive Action, 2023). It has become evident that Russia will disregard and violate international agreements during conflict. This case study focuses on globally recognized strong states, namely the US, Germany, the United Kingdom, and France, and their response within the framework of NATO, alongside other international agreements when confronted with conflict. Since 2002, the international community, particularly NATO, has consistently pledged NATO membership to Ukraine. In response, Ukraine has actively pursued and embraced pro-Western policies to meet the criteria for such membership. The urgency of Ukraine's accession to NATO became even more pronounced following the 2014 annexation of Crimea, as it aligns with the vital collective defense clause outlined in Article V. Ukraine has upheld international norms and agreements for decades, including its adherence to other important accords such as the NPT. Again, the international community has not directly provided Ukraine with security assurances, opting for proxy war tactics to fund Ukraine rather than utilizing their considerable military capabilities to uphold international social contracts. Despite signing multiple agreements emphasizing collective military action and having made little effort to facilitate Ukraine's entry into NATO, countries such as the US and Germany initially hesitated to send military aid to Ukraine regardless of their status as signatories on various documents. In the case of Germany, a notable strong state, its support for Ukraine is contingent on reciprocal efforts from the US.

NATO Chief of Staff Stian Jensen's recent proposal, suggesting Ukraine might consider territorial concessions in exchange for NATO membership, challenges the organization's core principles of sovereignty

and territorial integrity (Khalid, 2023). Despite Ukraine's persistent efforts to adhere to international norms, including its longstanding endeavor to meet NATO standards after being promised membership for two decades, the international community, which had pledged security to Ukraine, suggested that Ukraine yield more sovereignty in the form of land to Russia as a condition for institutional membership. This suggestion highlights the challenge faced by IGOs or Military Alliances in restraining powerful states, which often prefer weaker states to make additional policy concessions and reveals reluctance among strong states to offer sustained support for Ukraine. Even powerful states had to engage in diplomatic persuasion among themselves to provide some form of assistance to Ukraine. While such assistance was eventually provided, it remains noteworthy that the agreements establish comprehensive measures to safeguard against potential adversaries. Much like Russia, which initially promised full compliance with each of these agreements to Ukraine in exchange for Ukrainian submission, the response of strong states to conflict demonstrated a similar disregard for international social contracts and the limitations of other institutions in restraining the power of Russia.

In *Leviathan*, Hobbes (1984) advocates for establishing robust sovereign authority to avert the state of nature. IGOs and international agreements are designed to act as surrogate collective authorities, preserving international stability and states' interests. However, the overwhelming influence of powerful states often trumps these agreements and the presumed authority of IGOs in the global political arena. Recognizing that these proxy governing bodies are effective only when all parties are committed to collective action is essential. In cases where a dominant state, such as Russia, deviates from the norm, the international community fails to maintain control of adversaries. Moreover, when confronted with conflicts, strong states tend to exhibit hesitancy in upholding international social contracts, prioritizing their self-preservation over collective obligations. In response to this evident power imbalance, Hobbes would contend that a centralized government authority is imperative. Such an authority would have the capacity to compel powerful states into compliance, thereby mitigating the potential for unilateral actions that could disrupt the established order, underscoring Hobbes' belief that a unifying governing body is essential to safeguard

against the precarious state of nature and sustain a stable social contract among states (Hobbes, 2021).

Conclusion

Without hierarchical authority, these agreements aim to ensure equal opportunities among states. Still, strong states often override them in times of conflict, revealing a pattern suggesting that states prioritize self-preservation, especially powerful ones, over social contracts with weaker counterparts. This observation doesn't necessarily apply universally to economic or environmental alliances. Further research is necessary to ascertain whether conflict influences strong states to uphold such agreements or if they tend to disregard specific provisions. Additional variables will be crucial in understanding why strong states might deviate from international social contracts, given the complexity of this topic, which may require a more comprehensive analysis to fully grasp the motivations behind strong states' adherence or deviation, as well as why weak states often remain steadfast in upholding contracts despite unfavorable circumstances.

References

- Borger, J. (2023, May 5). We Knew in 2011 Putin Would Attack Ukraine, Says Bill Clinton. *The Guardian*. <https://www.theguardian.com/world/2023/may/05/we-knew-putin-would-attack-ukraine-back-in-2011-says-bill-clinton>.
- Center for Preventive Action. (2023, August 15). War in Ukraine. Council on Foreign Relations. <https://www.cfr.org/global-conflict-tracker/conflict/conflict-ukraine>
- Chappell, B. (2014, March 15). Russia Vetoes U.N. Security Council Resolution On Crimea. National Public Radio. Retrieved from <https://www.npr.org/sections/thetwo-way/2014/03/15/290404691/russia-vetoes-u-n-security-council-resolution-on-crimea>
- Gause, F. G. (2002). Iraq's Decisions to Go to War, 1980 and 1990. *Middle East Journal*, 56(1), 47-70. <http://www.jstor.org/stable/4329720>
- Greenwood, C. (1991). Iraq's Invasion of Kuwait: Some Legal Issues. *The World Today*, 47(3), 39-43. <http://www.jstor.org/stable/40396273>
- Hara, K. (2004). International Relations of the Asia-Pacific, 4(2), 324-326. <http://www.jstor.org/stable/26156520>
- Hobbes, T. (1894). *Leviathan: Or, The Matter, Form, and Power of a Commonwealth Ecclesiastical and Civil*. United Kingdom: G. Routledge and sons.
- Humanitarian Careers. (n.d.). 7 Reasons Why The United Nations Is Bad For The World. <https://humanitariancareers.com/why-united-nations-bad/>
- Interfax-Ukraine. (2017). Rada restores Ukraine's course for NATO membership as foreign policy priority. Retrieved from <https://en.interfax.com.ua/news/general/427216.html>
- Khalid, T. (2023, August 15). NATO Official: Kyiv May Have to Cede Territory to Russia in Exchange for Membership. Al Arabiya English. <https://english.alarabiya.net/News/world/2023/08/15/NATO-official-Kyiv-may-have-to-cede-territory-to-Russia-in-exchange-for-membership>

- Lanoszka, A. (2022). *Military Alliances in the Twenty-First Century*. Polity Press.
- MacAskill, E., & Borger, J. (2004, September 15). Iraq war was illegal and breached UN charter, says Annan. *The Guardian*. <https://www.theguardian.com/world/2004/sep/16/iraq.iraq>
- Mearsheimer, J. J. (1994). The False Promise of International Institutions. *International Security*, 19(3), 5–49. <https://doi.org/10.2307/2539078>.
- Mearsheimer, J. J. (2001). *The Tragedy of Great Power Politics*. W.W. Norton & Company.
- Moehler, M. (2018). Diversity, Stability, and Social Contract Theory – Philosophical Studies. *SpringerLink*. <https://link.springer.com/article/10.1007/s11098-018-1174-8>
- Morgenthau, H. J., & Thompson, K. (2018). *Politics Among Nations: The Struggle for Power and Peace*. Kalyani Publishers.
- Morrow, J. D. (1991). Alliances and Asymmetry: An Alternative to the Capability Aggregation Model of Alliances. *American Journal of Political Science*, 35(4), 904–933. <https://doi.org/10.2307/2111499>
- Morrow, J. D. (1994). Alliances, Credibility, and Peacetime Costs. *The Journal of Conflict Resolution*, 38(2), 270–297. <http://www.jstor.org/stable/174296>
- Morrow, J. D. (2000). Alliances: Why Write Them Down? *Annual Review of Political Science*, 3, 63–83. <https://doi.org/10.1146/annurev.polisci.3.1.63>
- National Archives and Records Administration. (2014, March 20). Statement By the President on Ukraine. <https://obamawhitehouse.archives.gov/the-press-office/2014/03/20/statement-president-ukraine>.
- NATO. (2023, August 24). Relations with Ukraine. North Atlantic Treaty Organization. https://www.nato.int/cps/en/natohq/topics_37750.htm
- NATO. 2023. Collective Defense and Article 5. North Atlantic Treaty Organization. https://www.nato.int/cps/en/natohq/topics_110496

- [.htm#:~:text=Article%20%20provides%20that%20if.to%20assist%20the%20Ally%20attacked.](#)
- Oatley, T. H. (2019). *International Political Economy*. Routledge.
- Office of the Historian, Foreign Service Institute, United States Department of State. (n.d.). *Soviet Invasion of Czechoslovakia, 1968*. U.S. Department of State Office of the Historian. Retrieved from <https://history.state.gov/milestones/1961-1968/soviet-invasion-czechoslovakia>
- Reynolds, P. A. (1949). The Nazi-Soviet Pact, April 1939-June 1941. *The Slavonic and East European Review*, 28(70), 232-243. <http://www.jstor.org/stable/4204110>
- Roberts, G. (1992). The Soviet Decision for a Pact with Nazi Germany. *Soviet Studies*, 44(1), 57-78. <http://www.jstor.org/stable/152247>
- Speck, U. (2016). The West's Response to the Ukraine Conflict: A Transatlantic Success Story. 2015-16 Paper Series No. 4. Transatlantic Academy. https://www.gmfus.org/sites/default/files/speck_west_responseukraine_apr16_web.pdf
- United Nations. (1945). *Charter of the United Nations: Full Text*. United Nations. <https://www.un.org/en/about-us/un-charter/full-text>
- United Nations Office for Disarmament Affairs. (n.d.). Nuclear Non-Proliferation Treaty (NPT). <https://disarmament.unoda.org/wmd/nuclear/npt/>
- Umland, A. (2016). THE UKRAINE EXAMPLE: Nuclear Disarmament Doesn't Pay. *World Affairs*, 178(4), 45-49. <http://www.jstor.org/stable/24888130>
- Volker, K. (2014, March 19). Where's NATO's Strong Response to Russia's Invasion of Crimea? Foreign Policy. <https://foreignpolicy.com/2014/03/18/wheres-natos-strong-response-to-russias-invasion-of-crimea/>.
- Waltz, K. N. (2010). *Theory of International Politics*. Waveland Press.
- Wilson, A. (2016, June 4). Ukrainian Politics Since Independence. E-International Relations. <https://www.e-ir.info/2015/03/30/ukrainian-politics-since-independence/>

As Seen on TV: The Effects of Pharmaceutical Advertising on the Doctor-Patient Relationship

Ashlesha Bhojane

Currently, the United States of America is one of only two countries, alongside New Zealand, that allows pharmaceutical companies to directly advertise their prescription drugs to consumers. This marketing of drugs, such as Humira and Xeljanz, often takes the form of video advertisements on television broadcasting. Notably, these advertisements are minimally monitored by the Food and Drug Administration (an organization responsible for ensuring the efficacy and safety of drugs used by humans) before they are seen by people who may have limited knowledge about the treatment of their illnesses.

Under ideal conditions in medical practices, the physician and patient work together as a team to examine the patient's illness and determine the best treatment. Mental-emotional respite is meant to be conferred by the doctor to the patient, though some people feel commercials also provide brief respite and empower the patients. Given the disparity in the viewpoints of the doctor and patient, exploring the effects of pharmaceutical advertising on clinical interactions from the perspectives of both the doctor and patient is worthwhile.

Through an examination of studies on the topic and a survey given to both patients and doctors, the effects of pharmaceutical advertising on the physician-patient relationship were investigated for a class research project in a section of English 225 at the University of Missouri-Kansas City (UMKC). The physician survey collected data from the UMKC School of Medicine and the cardiology wing of St. Luke's Hospital in Kansas City, Missouri. The patient survey collected data from students at UMKC. None of these students had personal experience of mentioning a pharmaceutical during a visit, rather they described their predicted reactions and behaviors in response to a given scenario. Both surveys were given with the consent of those involved. My study demonstrates that pharmaceutical advertising does not affect the physician-patient relationship from the physician's perspective, but it has a

positive effect on the relationship from the patient's perspective because the patient feels more involved in their care.

Literature Review

The impact of direct-to-consumer pharmaceutical advertisements is significant. Abby Alpert reports that pharmaceutical advertisements increase drug sales. For every 10 percent increase in advertisement exposure, there is a five percent increase in prescriptions ordered (Knowledge at Wharton, 2017). In the past, pharmaceutical companies directed advertisements toward healthcare professionals. Recently, it has become more common for these advertisements to be directed to the general public. These advertisements are monitored and regulated in the United States by the Food and Drug Administration (FDA), which ensures that pharmaceutical companies truthfully showcase the benefits of the treatment while accurately acknowledging the risks (U.S. Food and Drug Administration, 2015).

However, some advertisements also promote unapproved uses of FDA-approved drugs. Kristina Klara and a research team from the Yale School of Medicine, the Yale School of Law, and the Collaboration for Research Integrity and Transparency (CRIT) at Yale University found that very few of these "off-label" advertisements follow FDA guidelines. These advertisements were also found to be virtually indistinguishable to the untrained eye from advertisements of FDA-approved uses. The information in most of the advertisements included in the study was deemed low quality (Klara et al., 2018). In general, many pharmaceutical advertisements do not necessarily provide the viewer with a proper, unbiased understanding of the treatments advertised.

Aside from pharmaceutical advertisements, in everyday healthcare, successful treatment of the patient depends upon trust between the patient and the doctor as opposed to prescriptions. Heather Orom and a research team showed in a 2016 study that stronger physician-patient relationships promote proper adherence to health treatment plans and better health outcomes in patients.

Soniya Lubomyirsky (Ruberton et al., 2016) showed that the more humble the physician acted with the patient, the better the rapport between the two. On the other hand, physicians who acted arrogant failed to create rapport with their patients. This finding suggests that the quality

of the physician-patient relationship and interactions can be influenced by the actions and responses of the physician.

Some studies have found positive effects of pharmaceutical advertising on the doctor-patient relationship. Elizabeth Murray has studied the effects of digital materials on health practices for more than twenty years. An analysis of the effects of direct-to-consumer advertising on health behaviors (Murray et al., 2003) found that 14 percent of patients surveyed became more open about health concerns with their healthcare provider, and six percent made requests for preventive care. A majority of the patients who requested a specific course of treatment based on an intervention they saw in a commercial received it. One percent felt that their relationship with their physician had worsened as a result of their inquiry (Murray et al., 2003). The effects of pharmaceutical advertisements in this study seem to be due to the increased agency of the patient, who takes action that alters the physician-patient relationship. Therefore, in some instances, pharmaceutical advertising can have an empowering effect on the patient and encourage them to better communicate with their physician.

Much of the literature suggests a net negative impact of pharmaceutical advertising on the doctor-patient relationship. James E. Dalen and colleagues (Zachry et al., 2003) found that physicians were more likely to react with frustration and annoyance toward a patient who mentioned a drug from an advertisement than a patient who mentioned the same drug in a different context. This suggests that physicians may have negative attitudes toward pharmaceutical advertisements.

A study by Andrew Robinson and colleagues (2004) found that physicians attribute the negative impact of pharmaceutical advertisements to the change in patients' expectations of prescribing practices, an increase in visit time, and requests for the advertised pharmaceutical. The change in patients' expectations of prescribing practices is best seen when a physician refuses to grant a request made based on pharmaceutical advertisements. Robert Bell and colleagues (1999) found that about half of patients would be disappointed upon denial of their request, while nearly a fourth would look elsewhere.

This change, in which a patient expects their request for certain medications to be granted, is somewhat reasonable. In a survey of physicians by Elizabeth Murray and colleagues (2003), nearly 49 percent

of the requests physicians received from their patients regarding pharmaceutical medications seen in direct-to-consumer advertising were deemed inappropriate. However, 69 percent of these inappropriate requests were granted regardless. This statistic suggests physicians may acquiesce to patients' requests to earn higher patient satisfaction ratings. Multiple research articles support this physician bias in favor of advertised medications. In an article about how pharmaceutical companies can create physician conflicts of interest, Reshma Jagsi states that some physicians receive targeted advertisements from pharmaceutical representatives or earn compensation for prescribing certain medications. Either or both parties in the doctor-patient relationship may be influenced towards choosing a specific treatment, regardless of whether it is the best one, due to prior exposure to pharmaceutical advertising (Jagsi, 2007). Due to physician bias, the patient may see a decrease in their physician's credibility, potentially leading to a strained relationship (Breen, 2004).

Methods

A survey was designed and given to physicians from the UMKC School of Medicine and the cardiology wing of St. Luke's Hospital in Kansas City, Missouri (see Appendix A). A survey designed for patients was given to first-year students at UMKC (see Appendix B). Descriptions of specific patient interactions involving discussion of pharmaceutically-advertised medications were also collected (see Appendix C). For specificity, physicians received a different survey (with different questions) than patients. For efficiency, the survey contained a disclaimer, screening questions, and survey questions. The disclaimer statement provides the necessary information to the participant for informed consent, including the type of data collected, how this data will be used, and other relevant information to the participants of this study. This section was present in both the physician and patient surveys.

There were three mandatory screening questions for physicians and four mandatory screening questions for patients (see Appendix A and Appendix B.) These questions helped determine which responses could be used. This question series clarified whether the patient had experience with the pharmaceutical advertisements studied. The screening questions for physicians clarified whether the physicians have experience in handling situations in which patients discuss pharmaceutical advertisements.

The survey asked about general attitudes toward pharmaceutical advertising and more specific questions about physician-patient interactions that featured an inquiry about a pharmaceutical seen in an advertisement. Since a fairly modest number of responses to the survey were expected, the survey featured some open-ended questions that allowed for more detail and elaboration on responses than the traditional multiple-choice format. Physicians who have had patients inquire about advertised medications were also asked to describe the interaction.

To collect usable data from participants who had never been in a situation in which they or their patient mentioned an advertised medication (assessed from the screening questions), there was an extra section to this portion of the survey. In this section, a generalized situation of a patient-physician interaction from the perspectives of the physician in the physicians' survey and the patient in the patients' survey was described. Upon familiarizing themselves with the situation given, the participants answered a series of questions that analyzed how they would react in the situation. This provides a way to predict the long-term effects of the physician's reaction to the request.

Results

Twelve responses were collected from the physician survey, and five responses were collected from the patient survey. Although a low number of responses were collected, future studies could replicate this design with a larger sample size that might produce generalizable results. In the physician survey, most physicians reported that they see medical advertisements very frequently (multiple times a day) or frequently (once a day) and are rarely visited by pharmaceutical representatives. Overall, physician attitudes towards pharmaceutical advertising were characterized by doubt of their usefulness, as the physicians believed that patients do not have the medical background to understand how the medication relates to their specific cases.

In response to a scenario of a patient inquiring about an advertised medication during a routine visit, physicians reported that they are fine with, and may even like, patients mentioning medications. They believe that it may foster a conversation on the validity of the medication and provide an opportunity to educate the patient. There was unanimous agreement that the medication inquired about would only be prescribed if

medically appropriate and that patients would likely have positive reactions if their request was granted. Most physicians predicted that patients would be upset if their request was denied and stated that they would explain their decision to promote neutrality. In both cases of granted or denied requests, most physicians stated that neither their opinion of the patient going forward nor their relationship with the patient would change.

In the patient survey, all patients reported that they visit the doctor annually. Most patients reported either frequently (once a day) or sometimes (once a week) seeing pharmaceutical advertisements. However, all patients reported paying little or no attention to these advertisements. The general attitudes towards pharmaceutical advertising were that of skepticism and inattentiveness to the specific details communicated, as the medications were not pertinent to any of the patients surveyed. None of the patients surveyed have ever discussed advertised medications with their physicians.

In response to a scenario in which the patient mentioned pharmaceuticals to their physician, most patients reported that they would feel comfortable asking their physician and feel more in control of their care. This increased sense of control relates to the feelings of involvement that patients may experience in these scenarios. Patients reported that they would be trusting of their physicians though inquisitive as to the reasoning behind their decision should their request be either granted or denied. In the face of a granted or denied request, the majority of patients reported that they would be as likely to listen to their physician going forward and see their relationship with their physician getting stronger following their initial inquiry about the medication. This finding challenges the preconceived notion that patients will be displeased with their doctor if their request for a specific advertised medication is denied without a proper explanation.

Conclusion

Pharmaceutical advertising is an important aspect of medical experiences from both the perspective of the patient and the physician. A greater understanding of the effects of pharmaceutical advertising on the physician-patient relationship will increase physicians' and patients' knowledge on the topic as well as make other people more aware of

external influences acting on their interactions with their physicians and/or patients. Consequently, aspects of physician-patient interactions that interfere with proper rapport-building may be elucidated. Addressing these issues may promote better physician-patient relationships, which have been tied to better health outcomes and adherence to treatment plans (Orom et al., 2016). Regardless of the time or circumstance, optimizing the quality and delivery of care is always a priority.

This class research project suggests that from the physician's perspective, pharmaceutical advertising has a neutral effect on the physician-patient relationship, whereas it has a positive effect on the physician-patient relationship from the patient's perspective. The trend of neutrality among physicians can be identified from responses to the physician survey. Importantly, most physicians who took the survey stated that they would not think differently of their patient or deliberately alter their existing relationship following their decision to either grant or deny the patient's request for a specific advertised medication. This avoidance of passing judgment and inclination to build rapport is well-explained by the sentiment provided by one physician respondent: "Our duty as physicians is to explain, to educate our patients on the benefits and appropriateness of the treatment we are recommending." This suggests that possible effects that pharmaceutical advertising may have on the physician-patient relationship from the physician's perspective are tempered by the tenets of the profession and commitment to professionalism that promote neutrality and open-mindedness among physicians. Therefore, physicians attempt to minimize the effect of pharmaceutical advertising on the physician-patient relationship.

From the patient's perspective, according to this class research project, pharmaceutical advertising has a positive effect on the physician-patient relationship. Many patients stated that their relationship with their physician would be good whether their request for a certain advertised medication was granted or denied. In the words of one patient respondent, "[T]he patient may have some ideas or input, but the doctor's experience and education can help guide the patient to take the right medicines." This addresses the traditional roles that exist within a doctor-patient relationship as they relate to the discussion of medications.

Most of the surveyed patients reported that they would feel comfortable with their physician's approval or refusal of the requested

medication so long as they were provided an adequate explanation behind the decision. This discussion would create further opportunities for the patient to become involved in their care, which seems to be a result of pharmaceutical advertising. These factors contribute positively to the physician-patient relationship, as stated in the responses to the survey. Therefore, the effects of pharmaceutical advertising on the doctor-patient relationship are positive from the patients' perspective. Interestingly, the participants' more positive response to being denied a requested advertised medication contrasts the findings of the literature previously discussed. The Bell study (1999) finding that the patient would be disappointed in the event of a denied request and may seek visits with other physicians runs contrary to the participants' predicted understanding and acceptance of the doctor's decision.

This project provides a perspective on current physician and patient views of the pharmaceutical industry as well as the doctor-patient relationship. Future studies should be conducted to investigate the issue of unconscious bias and the role it plays in subtle changes in behavior between the physician and patient following mentions of pharmaceutical advertising during clinical visits. Also, future studies should aim to uncover more information about how pharmaceutical advertising affects secondary aspects that may affect the doctor-patient relationship, such as resource distribution and medical affordability. Such investigations would provide insight into the effects of pharmaceutical advertising on the doctor-patient relationship.

References

- Bell, R. A., Wilkes, M. S., & Kravitz, R. L. (1999). Advertisement-induced prescription drug requests: patients' anticipated reactions to a physician who refuses. *The Journal of Family Practice*, 48(6), 446-452.
- Breen K. J. (2004). The medical profession and the pharmaceutical industry: when will we open our eyes?. *The Medical Journal of Australia*, 180(8), 409-410.
- Jagsi, R. (2007). Conflicts of Interest and the Physician-Patient Relationship in the Era of Direct-to-Patient Advertising. *Journal of Clinical Oncology: Official Journal of the American Society of Clinical Oncology*, 25(7), 902-905.
<https://doi.org/10.1200/JCO.2006.08.7122>
- Klara, K., Kim, J., & Ross, J. (2018). Direct-to-Consumer Broadcast Advertisements for Pharmaceuticals: Off-Label Promotion and Adherence to FDA Guidelines. *Journal of General Internal Medicine*, 33, 651-658. <https://doi.org/10.1007/s11606-017-4274-9>
- Knowledge at Wharton. (2017). Cause and Effect: Do Prescription Drug Ads Really Work?
<https://knowledge.wharton.upenn.edu/article/prescription-drug-ads/#:~:text=We%20estimate%20that%20a%2010>
- Murray, E., Lo, B., Pollack, L., Donelan, K., & Lee, K. (2003). Direct-to-Consumer Advertising: Physicians' Views of Its Effects on Quality of Care and the Doctor-Patient Relationship. *Journal of the American Board of Family Medicine*, 16(6), 513-524.
<https://doi.org/10.3122/jabfm.16.6.513>
- Murray, E., Lo, B., Pollack, L., Donelan, K., & Lee, K. (2003). Direct-to-Consumer Advertising: Public Perceptions of Its Effects on Health Behaviors, Health Care, and the Doctor-Patient Relationship. *Journal of the American Board of Family Medicine*, 17(1), 6-18. <https://doi.org/10.3122/jabfm.17.1.6>
- Orom, H., Underwood, W., Cheng, Z., Homish, L., & Scott, I. (2016). Relationships as Medicine: Quality of the Physician-Patient Relationship Determines Physician Influence on Treatment

- Recommendation Adherence. *Health Services Research*, 53(1), 580-596. <https://doi.org/10.1111/1475-6773.12629>
- Robinson, A. R., Hohmann, K. B., Rifkin, J. I., Topp, D., Gilroy, C. M., Pickard, J. A., & Anderson, R. J. (2004). Direct-to-Consumer Pharmaceutical Advertising: Physician and Public Opinion and Potential Effects on the Physician-Patient Relationship. *Archives of Internal Medicine*, 164(4), 427-432.
- Ruberton, P. M., Huynh, H. P., Miller, T. A., Kruse, E., Chancellor, J., & Lyubomirsky, S. (2016). The relationship between physician humility, physician-patient communication, and patient health. *Patient Education and Counseling*, 99(7), 1138-1145. <https://doi.org/10.1016/j.pec.2016.01.012>
- U.S. Food and Drug Administration. (2015). The Impact of Direct-to-Consumer Advertising.
- Zachry, W. M., Dalen, J. E., & Jackson, T. R. (2003). Clinicians' Responses to Direct-to-Consumer Advertising of Prescription Medications. *Archives of Internal Medicine*, 163(15), 1808-1812.

Appendix A

Physician Survey

Disclaimer: This survey will collect information about your interactions with your physician as affected by medical advertisements that are displayed on a wide variety of streaming services. The data collected will be used in a research project for the English 225 class at the University of Missouri-Kansas City. All responses are confidential and collected anonymously.

Screening Questions:

1. How often do you see medical advertisements on television (or other streaming services)?
 - a. Never
 - b. Rarely
 - c. Sometimes (about once a week or once a month)
 - d. Frequently (once a day)
 - e. Very frequently (multiple times a day)
2. How often are you visited by pharmaceutical representatives?
 - a. Never
 - b. Rarely
 - c. Sometimes (about once a week or once a month)
 - d. Frequently (once a day)
3. How often do your patients mention pharmaceutical advertisements during patient visits?
 - a. Never
 - b. Rarely (once a month or more infrequent)
 - c. Sometimes (about once a week)
 - d. Frequently (once a day)
 - e. Very Frequently (multiple times a day)

Survey Questions:

1. How do you feel about pharmaceutical advertising?
2. If you have had patients mention advertised medications to you during clinical visits, please elaborate on one (or more) of these experiences.
 - a. (Open-ended)

If you have never had a patient mention advertised medications to you, please answer the following questions based on the given scenario:

You receive a patient during one of their regularly scheduled visits to your office. When you are discussing treatment plans with them, they mention a medication that they saw on TV that treats their condition.

3. What would you think of the patient's request?
 - a. (Open-ended)
4. Would you prescribe the medication they mentioned?
 - a. (Open-ended)
5. Say you deemed the prescription appropriate and prescribed it to the patient. How do you think they would react?
 - a. (Open-ended)
6. How would their likely reaction influence your feelings about them?
 - a. (Open-ended)
7. How do you feel this would affect your relationship with the patient going forward?
 - a. (Open-ended)
8. Now, say you deemed the prescription inappropriate for treating the patient and refused to prescribe it. How do you think they would react?
 - a. (Open-ended)
9. How would their likely reaction influence your feelings about them?
 - a. (Open-ended)

10. How do you feel this would affect your relationship with the patient going forward?
 - a. (Open-ended)

Appendix B

Patient Survey

Disclaimer: This survey will collect information about your interactions with your physician as affected by medical advertisements that are displayed on a wide variety of streaming services. The data collected will be used in a research project for the English 225 class at the University of Missouri-Kansas City. All responses are confidential and collected anonymously.

Screening Questions:

1. How often do you visit the doctor (annual checkups, appointments, etc.)?
 - a. Once a year
 - b. Less frequently than once a year, more frequently than once a month
 - c. Once a month
 - d. More frequently than once a month
2. How often do you see medical advertisements on television (or other streaming services)?
 - a. Never
 - b. Rarely
 - c. Sometimes (about once a week or once a month)
 - d. Frequently (once a day)
 - e. Very frequently (multiple times a day)
3. How much attention do you pay to these advertisements?
 - a. None
 - b. Little
 - c. Fair
 - d. A lot

4. How often do you discuss medications that you saw in a commercial with your doctor?
 - a. Never
 - b. Rarely
 - c. Sometimes (during few visits)
 - d. Frequently (during some visits)
 - e. Very frequently (during most visits)

Survey Questions:

1. How do you feel about medical advertisements?
2. If you have mentioned medications you saw in a commercial to your doctor, please elaborate on one (or more) of these experiences.
 - a. (Open-ended)

If you have never mentioned advertised medications to your doctor, please answer the following questions based on the given scenario:

You see a commercial about a certain medication that treats your condition. However, you notice that it is one that your doctor has not mentioned during your visits. You decide to mention it yourself and inquire about it as an option for your care.

3. How would you feel while inquiring about the medication?
 - a. (Open-ended)
4. How would you react if your doctor agreed to prescribe the medication?
 - a. (Open-ended)

5. How would their positive reaction influence your feelings about them?
 - a. (Open-ended)
6. How do you feel this would affect your relationship with your physician going forward?
 - a. (Open-ended)
7. Would you be as likely to listen to their advice going forward?
 - a. Yes
 - b. No
8. How would you react if your doctor refused to prescribe the medication?
 - a. (Open-ended)
9. How would their negative reaction influence your feelings about them?
 - a. (Open-ended)
10. How do you feel this would affect your relationship with your physician going forward?
 - a. (Open-ended)
11. Would you be as likely to listen to their advice going forward?
 - a. Yes
 - b. No

Appendix C

Descriptions of Specific Patient Interactions from Physician Survey

If you have had patients mention advertised medications to you during clinical visits, please elaborate on one (or more) of these experiences.

<p>I have not had a patient bring up a pharmaceutical advertisement in clinic.</p>
<p>Several patients have learned about Eliquis, or Xarelto, from advertisement, as well as the watchman procedure. Also, some have heard about the new diabetes, cardio metabolic friendly medicines, and they will approach me about these proactively, such as Jardiance or Ozempic.</p>
<p>I don't have any strong stories here. We prescribe Eliquis a lot for atrial fibrillation, and that gets advertised, so it is not infrequent that patients will say "oh yeah. . . I saw that on TV".</p>
<p>This happens daily. We usually discuss the drug mentioned but also other options.</p>
<p>I had a patient with HF mention that she saw an advertisement on TV for Entresto and wanted to know if I thought she should be on it. It worked out well because I was going to bring it up anyway. This made for an easy transition to a new medication.</p>
<p>n/a</p>

<p>I explain why the medication is indicated or not indicated. I also discuss insurance coverage.</p>
<p>Most commonly when prescribing entresto, a DOAC or an SGLT2i the patients express that they have heard about the medicine.</p>
<p>I have discussed them and informed them the ad offers a false premise we have no barriers to its use</p>
<p>Patients have asked about anticoagulants during a clinic visit.</p>
<p>Rarely it has been helpful when patients need a new medication and they have some familiarity with it from advertising. They may be more accepting of it and have some knowledge of potential risks and side effects mentioned in the ad.</p>
<p>really can't recall a specific instance</p>

Kansas City, Missouri Climate Change Indications: An Analysis of Climate Data Between 1973 and 2023

Nico Bradshaw

Climate change is a pressing global issue, posing a significant threat to the environment and human life. The Intergovernmental Panel on Climate Change (IPCC) defines climate change as “a change in the state of the climate that can be identified . . . by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer” (Robin Matthews 544). Various natural processes and events, including solar cycles and volcanic eruptions, can contribute to climate change. However, the general scientific consensus is that human activity has contributed significantly to the increase in global temperature since the Industrial Revolution (“Climate Change Indicators”). Climate change can negatively affect human health, water, and food supplies, physical infrastructure, and various ecosystems and organisms (“Climate Change Impacts”).

Climate change is a global phenomenon, leaving no region unaffected, including the United States. Despite action against climate change, the United States Environmental Protection Agency (EPA) states that since the 1970s, the United States has been warming at a faster rate than the rest of the globe (“Climate Change Indicators”). Given the size and variation in climates and ecosystems in the United States, climate change can have different effects depending on the region. However, one consistent effect of climate change is increased temperatures (“Climate Change Impacts”). The Midwestern United States has had an increase in the average air temperature by more than 0.8°C between 1900 and 2010 (Pryor et al. 18). Missouri’s climate, much like the rest of the Midwest, is getting hotter. As of 2016, most of the state of Missouri had warmed by at least 0.2°C in the past century (“What Climate Change Means for Missouri”). This increase in temperature can affect agriculture and human health (“Climate Change Impacts”). Increased temperatures can be especially concerning for urban areas, which tend to experience a phenomenon known as the heat island effect. Heat islands are urban areas that experience higher temperatures than outlying areas due to human

activity and man-made structures (“Heat Island Effect”). This concern extends to Missouri’s largest city, Kansas City. Despite this concern, little research has examined climate change in Kansas City, Missouri. This study focuses on determining the presence and significance of changes in climate in Kansas City, Missouri, between 1973 and 2023. For simplicity, Kansas City, Missouri, will henceforth be referred to as Kansas City.

Methods

Archival Data Collection

Analysis of archival climate data collected by the Kansas City International Airport (KCI) reported to the National Centers for Environmental Information (NCEI) between January 1, 1973, and December 31, 2022, was used to determine the presence of changes in the climate in Kansas City. KCI is located in Kansas City, Missouri, north of the Missouri River. NCEI climate data is published to the NCEI Data Access application and is subjected to quality control procedures.

Data Analysis

For this study, changes in the climate were determined using temporal trend analysis, which allows for the modeling of trends in variables over time. The analytical methods used included correlational studies and measurements of relative change. Correlational studies were conducted to analyze the relationship between time and other factors, including the average yearly temperature; the number of days under -17.78°C , under 0.00°C , over 0.00°C , over 21.11°C , and over 32.22°C ; the total annual snowfall; and the total annual precipitation. Relative changes were calculated to determine the average rate and quantity of change in average yearly temperatures. Data on total annual snowfall for 1996 was unavailable.

Results

Multiple data trends point to an increase in temperature in Kansas City. There was a moderate positive correlation between time and average yearly temperature ($r = 0.43$) and between time and the number of days over 21.11°C per year ($r = 0.45$). There was a moderate negative correlation between time and the number of days under 32°C per year ($r = -0.48$) and between time and the number of days over 0°C per year ($r =$

–0.36). There was a weak negative correlation between time and total snowfall per year ($r = -0.16$) and between time and the number of days under 0°C per year ($r = -0.14$). The total annual snowfall decreased by 35.40 millimeters between 1980 and 2020. There was a measured increase in the average temperature per decade between 1980 and 2020. The average temperature during the 1980s was 12.17°C compared to 12.91°C during the 2010s, an increase of 0.74°C . The average yearly temperature is increasing at a rate of approximately 2.49% each decade. There was no correlation between time and total annual precipitation ($r = 0.08$) and between time and number of days over 32.22°C per year ($r = 0.04$).

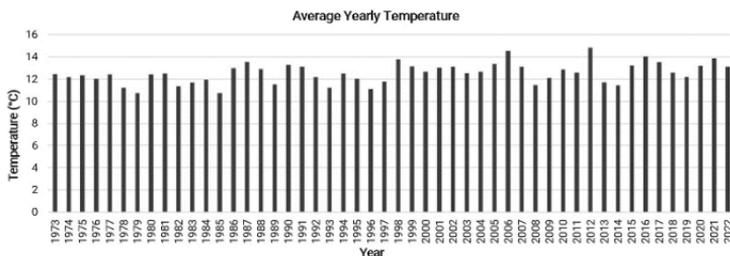


Figure 1. The average yearly temperature for Kansas City, Missouri, based on data from the NCEI.

Discussion

Climate Change

As previously mentioned, climate change is defined, in simple terms, as an identifiable change in climate over time. While changes in climate can occur naturally, most climate scientists attribute a significant portion of the rise in global surface temperature from pre-industrial levels to human activity (“Climate Change Indicators”). To determine the presence and significance of climate change in Kansas City, the indications, causes, and impact of climate change must first be discerned.

Indications

The United States EPA links many observed changes in climate, such as rising temperatures, shifts in rainfall or snowfall patterns, and increased extreme weather events, to human-induced climate change (“Climate Change Indicators”). According to the collected data, rising temperatures are the most prominent indication of human-induced climate change in Kansas City. The average temperature in Kansas City increased by 0.74°C between 1980 and 2020, approximately 0.185°C per decade. However, the National Oceanic and Atmospheric Administration determined that globally, the Earth’s temperature has risen approximately 0.18°C per decade since 1981 (“Annual 2021 Global Climate Report”), indicating Kansas City is heating faster than the rest of the globe on average. No significant changes in rainfall patterns could be determined; however, there was a decrease in total annual snowfall. The total annual snowfall in Kansas City decreased by 35.40 millimeters between 1980 and 2020. These changes are all significant indications of climate change.

Causes

The IPCC has determined that the largest contributor to climate change—human-induced or otherwise—since the Industrial Revolution is the emissions of greenhouse gases, particularly carbon dioxide (“Climate Change Widespread, Rapid, and Intensifying” 1). The World Meteorological Organization attributes the increase in atmospheric carbon dioxide since the Industrial Revolution primarily to emissions from the combustion of fossil fuels and cement production (Crotwell et al. 6). Kansas City’s largest producer of greenhouse gases on average is on-road transportation, which emitted more than 3 million metric tons of carbon dioxide equivalent in 2017, a 13% increase from 2013 (*2017 Greenhouse Gas Inventory Update* 11). The next greatest source of greenhouse gas emissions is commercial energy, followed by residential energy, industrial energy, and solid waste. Overall, Kansas City emitted more than 8.8 million metric tons of carbon dioxide equivalent in 2017 (*2017 Greenhouse Gas Inventory Update* 11). For comparison, Boston, Massachusetts, emitted approximately 6.4 million metric tons of carbon dioxide equivalent in 2018 (*City of Boston Greenhouse Gas Emissions Inventory 2005–2019* 33). New York City, New York, emitted approximately 52 million metric tons of carbon dioxide equivalent in 2016 (*Inventory of New York City Greenhouse*

Gas Emissions in 2016 2). Given the correlation between human-induced climate change and greenhouse gas emissions determined by the IPCC, greenhouse gases are a likely contributor to the increase in average yearly temperature in Kansas City between 1973 and 2023.

Impact

While the effects of climate change in general can be both negative and positive, the effects on human life are primarily adverse. Continued increases in the average yearly temperature can have many detrimental effects on human health. Heat is considered one of the deadliest weather phenomena (“Climate Change Impacts”). Cases of hyperthermia, which include heat exhaustion, heat syncope, and heat stroke, can increase with extreme heat (“Hyperthermia”). Increased average temperatures can particularly harm socially vulnerable groups, such as impoverished individuals and people of color. (“Climate Change and the Health of Socially Vulnerable People”). Additionally, increases in yearly temperatures can have competing effects on agriculture. While decreases in snowfall and the number of days below 0°C can increase crop yields and growing seasons, increases in periods of extreme heat and droughts can decrease crop yields (“Climate Change Impacts on Agriculture”). Climate change can also increase the threat of extreme weather events (“Impacts of Climate Change”), such as inland flooding and wildfires, all of which pose significant threats to human health, infrastructure, and the environment. Any significant changes to ecosystems and environments can decrease their habitability for human and other life and alter the available resources. As such, changes in climate have had measurable effects on species distributions and behavior, which can increase the occurrence of biological invasions, causing severe ecological damage via the degradation of habitats and native organisms (Mainka and Howard).

Climate change in Kansas City poses a threat to both human life and the environment. Kansas City has already seen changes in the environment that have negatively impacted human life. Since 1995, ragweed season in Kansas City has been prolonged by approximately 18 days (“What Climate Change Means for Missouri”), which can be particularly harmful to those with allergies and asthma (“Ragweed Allergy”). In 2012, a drought threatened water availability for municipal

and industrial water users along the Missouri River (“What Climate Change Means for Missouri”). A continued increase in the average temperatures in Kansas City will likely increase the negative impacts on both human life and the environment.

Limitations of this study

Due to the nature of the research question posed and the analytical methods used, there are potential limitations to this study. The data analyzed was limited to that collected by KCI between January 1, 1973, and December 31, 2022. No comprehensive data from other sites in Kansas City were available for comparison. KCI is located in the Kansas City, Missouri Northland, which may have different weather patterns than Kansas City as a whole. Furthermore, fifty years is insufficient time to make definite conclusions regarding changes in climate. Further analysis of Kansas City’s climate trends is necessary. Additionally, the analytical methods used in this study are subject to error. Correlation, for instance, does not imply causation; correlational studies are only beneficial when a relationship has already been established between variables through other means of experimentation. Trend analysis predictions are not always accurate; random events or inaccurate data can distort trends, as can errors in computation. Lastly, while data submitted to the NCEI is subjected to quality control (“Archive”), errors in data collection can still occur.

Conclusion

The Kansas City weather data analyzed indicates the presence of significant changes in climate in Kansas City between 1973 and 2023. These changes are most likely the result of human activity, such as greenhouse gas emissions. To reduce the impacts of climate change in Kansas City, it is necessary to reduce the amount of greenhouse gases, particularly carbon dioxide, in the atmosphere.

Recommendations

Kansas City’s greenhouse gas emissions are minor relative to global emissions, which reached 41.3 gigatons of carbon dioxide equivalent in 2022 (*CO2 Emissions in 2022* 14). However, reducing

emissions in Kansas City can minimize both the local impacts of climate change and the city's contribution to global climate change. Kansas City has made efforts to reduce greenhouse gas emissions as per the Climate Protection Plan (*Kansas City, Missouri Climate Protection & Resiliency Plan*). Kansas City reduced total emissions of greenhouse gases for city operations by 21% between 2000 and 2017 (*2017 Greenhouse Gas Inventory Update 11*). However, emissions from on-road transportation, the leading source of emissions in Kansas City, increased by approximately 13% between 2013 and 2017 (*2017 Greenhouse Gas Inventory Update 11*). Continued reduction in atmospheric greenhouse gases is crucial for minimizing the impacts of climate change. In 2022, Kansas City adopted the Climate Protection and Resiliency Plan (CPRP), which aims to achieve climate neutrality—net zero greenhouse gas emissions—city-wide by 2040 (*Kansas City, Missouri Climate Protection & Resiliency Plan 4*).

While efforts to reduce greenhouse gas emissions can effectively minimize climate change's impacts, conversion to alternative energy sources that do not rely on the burning of fossil fuels can help eliminate emissions at their source. Several cities within the United States have successfully converted to alternative energy forms, such as Aspen, Colorado. Aspen began using hydroelectric power in 1885 and has since begun using 100% renewable energy to power the City of Aspen's electric system ("Renewable Energy"). While total conversion to alternative energy sources takes time, even minor conversions to alternative energy sources could reduce Kansas City's reliance on fossil fuels. However, many people pose concerns about alternative energy sources, such as the economic impact. Clean energy projects can be expensive to implement but have largely positive long-term economic effects. Alternative energy sources have many indirect economic benefits, such as "the reduced health and environmental restoration costs stemming from their lower environmental impact" (National Renewable Energy Lab). Alternative energy can also have direct economic benefits; investment in clean energy has been shown to create more opportunities for employment than investment in fossil fuels (Garrett-Peltier 439-447). The Kansas City CPRP includes a plan to transition to clean energy (*Kansas City, Missouri Climate Protection & Resiliency Plan 24*); however, the specifics of this transition, such as the timeline and energy sources, were not included.

Another method for reducing atmospheric greenhouse gases is carbon dioxide removal or sequestration, an approach to removing carbon dioxide from the atmosphere via human activities, such as reforestation (“Carbon Dioxide Removal”). Reforestation, the growing and nurturing of trees in depleted forest land, is a common and effective form of carbon dioxide removal (Nave et al. 115). While reforestation is primarily done in rural areas, urban reforestation can also be effective for storing carbon dioxide emissions (Safford et al.). There are concerns regarding the drawbacks to reforestation, such as the economic requirements. While reforestation can be costly, it can be economically beneficial in the long run. For example, trees in Washington, D.C., have reduced residential energy expenditures by \$2.65 million annually (Nowak et al. 10). Currently, Kansas City’s CPRP indicates three main opportunities for carbon dioxide removal: urban reforestation, riparian restoration, and soil management (*Kansas City, Missouri Climate Protection & Resiliency Plan* 33). While reforestation is one the most widely recognized methods of carbon dioxide removal, other methods, such as those described in the CPRP, can also be effective. Riparian restoration, the preservation and restoration of wetlands adjacent to rivers and streams, could capture approximately 150,000 metric tons of carbon dioxide within Kansas City (*Kansas City, Missouri Climate Protection & Resiliency Plan* 33). Soil management involves using silicate-based rocks as soil additives, which can store approximately 1.28 kilograms of carbon per square meter of soil (*Kansas City, Missouri Climate Protection & Resiliency Plan* 33). Implementing these carbon dioxide removal methods could help offset carbon dioxide emissions in Kansas City.

The weather data collected by KCI between 1973 and 2023 clearly indicates human-induced climate change. Rises in temperatures, such as those indicated by the data analyzed, can have many detrimental effects on both the environment and human life. Action must be taken, both in accordance with and in addition to the Kansas City Climate Protection and Resiliency Plan, to reduce the local impacts of human-induced climate change. Legislative action and elected officials in Kansas City must support climate actions such as those recommended above. Additionally, further research examining the indications of climate change in Kansas City is necessary to determine the accuracy of the results of this research, as well as to monitor the effectiveness of the actions currently

being taken. Climate change poses a grave threat both to Kansas City and the world, and the time for action is now.

Works Cited

- 2017 Greenhouse Gas Inventory Update*. City of Kansas City, Missouri, Office of Environmental Quality.
- "Annual 2021 Global Climate Report." *National Centers for Environmental Information*, Jan. 2022, www.ncei.noaa.gov/access/monitoring/monthly-report/global/202113.
- "Archive." *National Centers for Environmental Information*, www.ncei.noaa.gov/archive. Accessed 12 May 2023.
- "Carbon Dioxide Removal." *United States Department of Energy*, www.energy.gov/fecm/carbon-dioxide-removal. Accessed 12 May 2023.
- City of Boston Greenhouse Gas Emissions Inventory 2005–2019*. City of Boston Environment Department, <https://www.boston.gov/sites/default/files/file/2021/10/City%20of%20Boston%202005–2019%20GHG%20Inventory%20Report.pdf>.
- "Climate Change and the Health of Socially Vulnerable People." United States Environmental Protection Agency, 13 Dec. 2022, www.epa.gov/climateimpacts/climate-change-and-health-socially-vulnerable-people.
- "Climate Change Impacts on Agriculture and Food Supply." *United States Environmental Protection Agency*, 13 Dec. 2022, www.epa.gov/climateimpacts/climate-change-impacts-agriculture-and-food-supply.
- "Climate Change Impacts." *National Oceanic and Atmospheric Administration*, 13 Aug. 2021, www.noaa.gov/education/resource-collections/climate/climate-change-impacts.
- "Climate Change Indicators: U.S. and Global Temperature." *United States Environmental Protection Agency*, July 2022, www.epa.gov/climate-indicators/climate-change-indicators-us-and-global-temperature.
- "Climate Change Widespread, Rapid, and Intensifying." *Intergovernmental Panel on Climate Change*, 9 Aug. 2021, https://www.ipcc.ch/site/assets/uploads/2021/08/IPCC_WGI-AR6-Press-Release_en.pdf. Press Release.

- CO2 Emissions in 2022*. International Energy Agency, Mar. 2023, <https://iea.blob.core.windows.net/assets/3c8fa115-35c4-4474-b237-1b00424c8844/CO2Emissionsin2022.pdf>.
- Crotwell, Andy et al. *Greenhouse Gas Bulletin: No. 18*. World Meteorological Organization, 26 Oct. 2022, https://library.wmo.int/doc_num.php?explnum_id=11352.
- Garrett-Peltier, Heidi. "Green versus Brown: Comparing the Employment Impacts of Energy Efficiency, Renewable Energy, and Fossil Fuels Using an Input-Output Model." *Economic Modelling*, vol. 61, 2017, pp. 439–447, <https://doi.org/10.1016/j.econmod.2016.11.012>.
- "Heat Island Effect." *United States Environmental Protection Agency*, 1 May 2023, www.epa.gov/heatislands.
- "Hyperthermia: Symptoms, Causes, Treatment and Recovery." *Cleveland Clinic*, 19 Nov. 2021, <https://my.clevelandclinic.org/health/diseases/22111-hyperthermia>.
- "Impacts of Climate Change." *United States Environmental Protection Agency*, 30 Dec. 2022, www.epa.gov/climatechange-science/impacts-climate-change.
- Inventory of New York City Greenhouse Gas Emissions in 2016*. New York City Mayor's Office of Sustainability, Dec. 2017, <https://www.nyc.gov/assets/sustainability/downloads/pdf/publications/GHG%20Inventory%20Report%20Emission%20Year%202016.pdf>.
- Kansas City, Missouri Climate Protection & Resiliency Plan*. City of Kansas City, Missouri, Dec. 2022, <https://www.kcmo.gov/home/showpublisheddocument/9912/638112897582470000>.
- Mainka, Susan A., and Geoffrey W. Howard. "Climate Change and Invasive Species: Double Jeopardy." *Integrative Zoology*, vol. 5, no. 2, 2010, pp. 102–111, <https://doi.org/10.1111/j.1749-4877.2010.00193.x>.
- National Renewable Energy Lab. *Dollars from Sense: The Economic Benefits of Renewable Energy*. No. DOE/GO-10097-261. 1 Sept. 1977, <https://doi.org/10.2172/538051>

- Nave, L. E., et al. "The Role of Reforestation in Carbon Sequestration." *New Forests*, vol. 50, 2018, pp. 115–137, <https://doi.org/10.1007/s11056-018-9655-3>.
- Nowak, David J., et al. *Assessing Urban Forest Effects and Values*. United States Department of Agriculture Forest Service, Sept. 2006, <https://doi.org/10.2737/NRS-RB-1>.
- Pryor, Sara C., et al. "Ch. 18: Midwest." *Climate Change Impacts in the United States: The Third National Climate Assessment*, Oct. 2014, pp. 418–434, <https://doi.org/10.7930/j0j1012n>.
- "Ragweed Allergy: Causes, Symptoms & Treatment." *American College of Allergy, Asthma and Immunology*, 23 Apr. 2018, <https://acaai.org/allergies/allergic-conditions/ragweed-allergy/>.
- "Renewable Energy." *City of Aspen*, www.aspen.gov/1202/Renewable-Energy. Accessed 12 May 2023.
- Robin Matthews, J. B., editor. *Annex I: Glossary. Global Warming of 1.5°C: IPCC Special Report on Impacts of Global Warming of 1.5°C above Pre-Industrial Levels in Context of Strengthening Response to Climate Change, Sustainable Development, and Efforts to Eradicate Poverty*, 2022, pp. 541–562, <https://doi.org/10.1017/9781009157940.008>.
- Safford, Hannah, et al. "Urban Forests and Climate Change." *Climate Change Resource Center*, Aug. 2013, www.fs.usda.gov/ccrc/topics/urban-forests.
- "What Climate Change Means for Missouri." *United States Environmental Protection Agency*, Aug. 2016, [19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-mo.pdf](https://www.epa.gov/sites/production/files/2016-09/documents/climate-change-mo.pdf).

YouTube's Flat-Earth Discourse Community

Caitlyn Davis

Since Ancient Greece, people have believed the Earth is round. It may seem unbelievable, but even today, people argue the Earth is flat. Social media, particularly YouTube, has been an important mechanism for distributing the beliefs of these “flat-Earthers.” The popular video platform YouTube has exploded in popularity since its conception in 2005, with over 2.5 billion annual users reported in 2022 (“YouTube Revenue and Usage Statistics (2022)”). With billions of users uploading, watching, and engaging in video content, fringe ideas and conspiracies can be exchanged in the same manner as news stories or baking tutorials. Even though a good deal of research has been published on the spread of flat-Earth ideas, the flat-Earth model continues to serve as a useful way to study how individuals can internalize beliefs at odds with common scientific consensus.

I argue that flat-Earthers constitute a discourse community propelled by social media. Understanding how this group operates fills a gap in scholarly knowledge about flat-Earthers as a discourse community. In this study, I evaluate flat-Earthers on YouTube according to linguist John Swale's six criteria of discourse communities (Swales par. 10). I will analyze videos from flat-Earth content creators, each with a considerable online following. When attempting to tackle societal issues that require the public's cooperation with the government, such as climate change or the COVID-19 pandemic, it is imperative to study how discourse communities like the flat-Earthers succeed in circulating distrust and misinformation.

Why do people today believe the Earth is flat?

Numerous researchers have studied factors that might affect an individual's perception of the strength of various flat-Earth arguments. Asheley Landrum, Alex Olshansky, and Othello Richards' 2019 study presented participants with either a control video (a tutorial for repairing a faucet) or one of three clips (scientific, conspiratorial, or religious) from the same flat-Earth YouTube video (144-146). Then, participants filled out

questionnaires about their views, scientific knowledge, and demographics (Landrum et al. 144). They were unsurprised to find that although most participants remained unconvinced after watching this short clip, those who scored higher on a conspiracy mentality scale were more likely to find the arguments to be strong and to be more interested in conducting their own research about the shape of the Earth (Landrum et al. 156-158). The clip that included the religious argument was rated as less strong than the scientific argument, suggesting that individuals may have a harder time discarding arguments they view as supported by science (Landrum et al. 157-158).

Alex Olshansky's 2018 master's thesis also explores factors contributing to flat-Earth beliefs. He aims to pinpoint how religiosity and conspiracy mentality contribute to these beliefs and find out how flat-Earthers view themselves (3). The study administered surveys to individuals representing a sample of the US population and from attendees of the 2017 Flat Earth Conference and compared the results (23). Olshansky found that conspiracy theory mentality was higher in the sample in flat-Earthers and that they viewed themselves higher in logic and skepticism than the national panel (31). He also found that while all flat-Earthers surveyed identified as religious, none wanted to be associated with organized religion, echoing the general distrust of mainstream institutions (42). This finding suggests flat-Earthers are likely to believe in other conspiracy theories and hold religious worldviews but not participate in organized religion.

Though conspiracy mentality may play a role in susceptibility to flat-Earth beliefs, scholars have gathered that the flat-Earth movement is not anti-science. Instead, flat-Earthers fail to trust evidence collected by others (Hossenfelder). Science writer Rachel Brazil comes to a similar conclusion: "While the spirit of experimentation may be there, flat-Earthers are not always prepared to change their minds when their experiments fail" (39). This resistance results in a stubborn community that goes to great lengths to justify their beliefs.

Misinformation, disinformation, and echo chambers on YouTube

Researcher Kate Starbird cited YouTube as a central hub for the distribution of false conspiratorial information online (Martin). When

cognitive scientist Asheley Landrum surveyed attendees of a flat-Earther conference, she found that all the respondents had learned about flat Earth on YouTube: twenty-nine discovered it themselves, and one was introduced by his daughter, who heard about it on YouTube (Fisher 220). In Carlos Diaz-Ruiz and Tomas Nillson's 2022 study, they selected 35 different flat-Earth YouTube videos and analyzed their rhetoric, creating broad categories of themes ("proof," conspiracy, biblical, etc.) and offered suggestions for countering mis/disinformation (3). By analyzing these videos, they found that instead of one single, consistent group, the flat-Earth community on YouTube is a muddled "patchwork" of arguments (Diaz-Ruiz and Nillson 7). Next, they discuss the idea of "echo chambers," where deception is intentionally planted and subsequently amplified by existing identity-driven controversies (12-13). Through YouTube, this flat-Earth echo chamber has generated an online community of like-minded individuals.

John Swales' "Concept of a Discourse Community"

Linguist John Swales defines a "discourse community" as a group using communication to achieve common goals (Wardle 466). In his book *Genre Analysis* (1990), he explains the need for a set of more specific criteria that can define this concept (Swales par. 1). He outlines his six criteria for a discourse community: a broadly agreed upon set of goals, a mechanism of communication among members, participation providing information and feedback, use of multiple genres, specific lexis or jargon, and a degree of rhetorical expertise in some members (par. 11-17). He provides the Hong Kong Study Circle as an example of a discourse community of which he is a member, with the shared goal of increasing awareness of Hong Kong's stamps (par. 18). Swales' model of a discourse community is a useful methodology for understanding YouTube's flat-Earth faction.

Methods

I have selected videos from the channels Flat Earth Dave Interviews, Celebrate Truth, and FlatEarth Photography after conducting a YouTube search for channels with the search term "flat Earth." I chose each channel from this search by looking at subscriber count and then qualitatively determining if each channel uploaded primarily flat-Earth

conspiracy content. All three videos were uploaded to channels with more than ten thousand subscribers. Flat Earth Dave Interviews has over ten thousand, Celebrate Truth has over one hundred forty-three thousand, and FlatEarth Photography has twenty-two thousand. I selected recent videos from each channel containing a different argument significantly odds with the scientific consensus.

Flat Earth Dave - "SGT Report – Lost in Space"

This YouTube video is a clip from a longer interview uploaded by the conspiracy channel "SGT Report," not on YouTube but on the platform BitChute. In the clip, flat-Earther David Weiss shows recent flight maps, claiming that the paths of these planes only make sense when imposed on a "flat-Earth" map, despite Weiss' complete lack of authority on the subject.

FlatEarth Photography - "Moon crater Theophilus vs. NASA fraud – Nikon coolpix P900"

In this video, creator FlatEarth Photography, who identifies himself as David in another video, uses a picture of the moon taken himself with a professional camera and compares it to images from Google and Wiki images. While ominous and intense orchestral music plays in the background, FlatEarth Photography zooms in closer to these images. Discrepancies in the appearance of one crater, Theophilus, are supposed to prove that the government is lying to us about the moon. This highlights flat-Earthers' fundamental mistrust of government institutions. The dramatic conclusion of the video leads viewers to a link to another video on the same channel that is more than two and a half hours long—as if the goal were to plant a seed of mistrust through a short and captivating video and later foster its growth by feeding it more ideas about the topic.

Celebrate Truth - "The Bible, NASA, and Flat Earth with Rob Skiba"

In this video, flat-Earth content creators under the channel names "Celebrate Truth" and "Parable of the Vineyard" interview prominent Christian flat-Earth YouTuber and author Rob Skiba. Skiba uses literal interpretations of the bible to find "evidence" of the Earth's true nature. For example, he cites the verse, "Earth takes shape like clay under a seal," as confirmation of flat Earth. In a moment of candor and sincerity,

Skiba explains that his “research” into flat Earth has strengthened his connection with God. The description also contains information for donations through PayPal and Patreon, meaning these creators can make money directly from this content, even if YouTube has flagged it as ineligible for ad revenue.

Analysis

The first characteristic of a discourse community Swales describes is “a broadly agreed set of common public goals” (Swales par. 11). All three videos were published to persuade the public to discard scientific consensus in favor of conspiratorial thinking, with creators urging viewers to do their own “research” on the topic. This suggests that the flat-Earth community wants to expand its reach and ranks. In the description sections of both Flat Earth Dave and Celebrate Truth’s videos, there are numerous links to other social media pages, affiliate codes, and Patreon accounts. Patreon is a website commonly utilized by online creators where users can make monthly or one-time donations in exchange for exclusive content from the creator (Johnson). The use of this platform highlights another motive for creating these videos: to earn money. Although it is impossible to know what is truly in the minds of these individuals, the time and commitment to such an unconventional and niche idea leads me to believe that monetization is not the sole factor driving these creators. If making money was the only goal, it would be much easier to create more mainstream content, which YouTube would monetize and promote in the algorithm. The main purpose of this community is to orient its audience away from scientific thinking and expose them to conspiratorial ideas.

Swales’ second feature of a discourse community is a mechanism of intercommunication among members (par. 13). The podcast format of both Flat Earth Dave and Celebrate Truth’s videos means that intercommunication among content creators must occur. For example, on Celebrate Truth’s podcast, guest Rob Skiba discusses his account of his evolving flat-Earth beliefs over time, in effect broadcasting these views to fellow content creators and audiences alike. These creators associate and promote each other’s videos, both verbally and by linking other YouTube channels in video descriptions, sharing an audience, and building personal relationships. In fact, their interactions seem more like honest and

vulnerable discussions among friends than ideological debates or indoctrinatory sermons, increasing the likelihood that peers or viewers become trusting. After all, a friend wouldn't lie, would they? In this way, members can spread ideas and theories freely among each other and viewers.

Third, Swales claims that a discourse community "uses its participatory mechanisms primarily to provide information and feedback" (par. 14). The primary participatory method for most members of this community is the comment section. In fact, the audience engages in the discourse themselves in the comment sections of all three videos. A quick scroll through each video's comments will yield comments praising the content and pointing out additional flat Earth arguments. This shows that the flat Earth community on YouTube participates in an active information exchange among both content creators and viewers.

Next, Swales states a discourse community must use multiple genres (par. 15). While all three exhibits are YouTube videos, each differs slightly in genre. Writing studies scholars Elizabeth Wardle and Douglas Downs define genres as "types of texts that are recognizable to readers and writers, and that meet the needs of the rhetorical situations in which they function" (467). FlatEarth Photography's video contains no recorded video but music playing while text and photos appear on the screen. Celebrate Truth's video is a podcast with many hosts speaking on each topic, while Flat Earth Dave's video is a short clip of a longer podcast. These different formats lend themselves to different rhetorical situations. For example, the short content of FlatEarth Photography and Flat Earth Dave's videos aim to recruit new members who are unlikely to make a large time investment, so they utilize attention-grabbing strategies. Longer-form content, like a podcast, is more suited towards those further down the echo chamber who are already interested in the topic.

According to Swales, members of a discourse community also gain the use of specialized language, or lexis (par. 16). In his video, Flat Earth Dave discusses "great circle routes," a specialized term used by navigators meaning the shortest airplane path (Britannica). Dave may be using this term to align himself with mathematicians and scientists despite his lack of credentials. In Celebrate Truth's podcast, Skiba often refers to a "dome" around the Earth. These terms are coopted by flat-Earthers for rhetorical purposes.

Last, Swales claims that a discourse community maintains a balance of amateurs and professionals as members come and go (par. 17). YouTube provides a great training mechanism for prospective flat-Earthers. New members are exposed to content through YouTube. They further develop their beliefs by watching and commenting on videos and then uploading their own content to the same platform. If they are charismatic enough, some develop a following. With susceptible individuals around the world continuously recruited in this cycle, the flat-Earth community will continue to grow even as elder members retire.

Conclusion

YouTube has facilitated the growth of a discourse community of flat-Earthers. Studying these conspiratorial discourse communities is essential to improving scientific literacy throughout the public. If we understand how these groups spread false information, we can apply the same concepts to other discourse communities to better understand how to counter them.

In their study, Diaz-Ruiz and Nillson outline strategies to counter disinformation at each step of the process. These solutions include actions on the part of social media sites, such as flagging disinformation, fact-checking, demonetization, deplatforming, and deprioritization in the algorithm (14). Although not legally required, social media companies have been experiencing pressure to limit the spread of misinformation on their platforms and have implemented numerous strategies in recent years (Shabayek et al.). Currently, YouTube utilizes deprioritization of certain content, fact-checking information panels to inform viewers of likely misinformation, and a three-strike suspension policy for users who violate community guidelines. Because of YouTube's potential to circulate disinformation, we must pay close attention to the conspiracy content users publish.

YouTube's countermeasures have improved in recent years, but conspiracy content is still easily accessible on the site. Unfortunately, many of YouTube's attempts to combat these echo chambers are interpreted by conspiracy communities as attempts to silence their voices. In addition to giving them the notion that they are being censored because they are "on to something," it also furthers this group's perceived divide between themselves and mainstream society. To counter this movement,

we should emphasize building trust between the population and institutions. Flat-Earthers need to know that the government and other organizations aren't the enemy; we are all on the same side. This trust is essential for cooperation and progress as a society.

Works Cited

- Brazil, Rachel. "Fighting flat-Earth Theory." *Physics World*, vol. 33, no. 7, IOP Publishing, July 2020, pp. 35–39.
<https://doi.org/10.1088/2058-7058/33/7/34>.
- Celebrate Truth. "The Bible, NASA and Flat Earth With Rob Skiba." *YouTube*, 2 July 2018, www.youtube.com/watch?v=lvJVbIKQ6a4.
- Diaz Ruiz, Carlos, and Tomas Nilsson. "Disinformation and Echo Chambers: How Disinformation Circulates on Social Media Through Identity-Driven Controversies." *Journal of Public Policy & Marketing*, SAGE Publications, Aug. 2022, p. 074391562211038. <https://doi.org/10.1177/07439156221103852>.
- Britannica, The Editors of Encyclopaedia. "great circle route." *Encyclopedia Britannica*, 13 Apr. 2017, <https://www.britannica.com/technology/great-circle-route>. Accessed 14 November 2022.
- Fisher, Max. *The Chaos Machine: The Inside Story of How Social Media Rewired Our Minds and Our World*. Little, Brown, 2022.
- Flat Earth Dave Interviews. "SGT Report – Lost in Space – [Clip]." *YouTube*, 4 Oct. 2022, www.youtube.com/watch?v=8xpx7oZS0ZM.
- FlatEarth Photography. "Moon Crater Theophilus Vs. NASA Fraud - Nikon Coolpix P900." *YouTube*, 17 Apr. 2018, www.youtube.com/watch?v=lj8lhglMTiU. www.youtube.com/watch?v=lj8lhglMTiU.
- Hossenfelder, Sabine. "Flat Earth 'Science' -- Wrong, but Not Stupid." *YouTube*, 22 Aug. 2020, www.youtube.com/watch?v=f8DQSM-b2cc.
- Johnson, Dave. "What Is Patreon? Everything You Need to Know About the Subscription Service for Content Creators." *Business Insider*, 18 Nov. 2020, www.businessinsider.com/guides/tech/what-is-patreon?international=true&r=US&IR=T.
- Landrum, Asheley R., et al. "Differential Susceptibility to Misleading Flat Earth Arguments on Youtube." *Media Psychology*, vol. 24, no. 1, Informa UK Limited, Sept. 2019, pp. 136–65. <https://doi.org/10.1080/15213269.2019.1669461>.
- Martin, Rachel. "Exploring YouTube and the Spread of Disinformation." *NPR.org*, 13 Apr. 2021,

www.npr.org/2021/04/13/986678544/exploring-youtube-and-the-spread-of-disinformation.

Olshansky, Alex. *Conspiracy Theorizing and Religious Motivated Reasoning: Why the Earth 'Must' Be Flat*. Texas Tech University, 2018. <https://ttu-ir.tdl.org/bitstream/handle/2346/82666/OLSHANSKY-THESIS-2018.pdf?sequence=1&isAllowed=y>

Shabayek, Shaden, et al. "Monitoring Misinformation Related Interventions by Facebook, Twitter and YouTube: Methods and Illustration." *HAL*, forthcoming. hal.archives-ouvertes.fr/hal-03662191.

Swales, John. "The Concept of Discourse Community." *Genre Analysis: English in Academic and Research Settings*. Boston: Cambridge UP, 1990. 21-32.

Wardle, Elizabeth, and Douglas Downs. *Writing About Writing*. 4th ed., Bedford/St. Martin's, 2011.

"YouTube Revenue and Usage Statistics (2022)." *Business of Apps*, 6 Sept. 2022, www.businessofapps.com/data/youtube-statistics.

“Barbara’s Way or the Highway”: An Analysis of Barbara Grier and Her Involvement with *The Ladder*, 1957-1972

Kale Marie Michael

From the outside looking in, many people may assume that the beliefs and values among members of the LGBTQ+ community are relatively homogenous. People who are not queer may think members of the LGBTQ+ community universally agree on the best ways to achieve basic civil liberties. However, a simple search on Twitter or scroll through TikTok will provide much evidence that any perceived universality of belief is a falsehood. Conflicts about how to best achieve queer liberation, whom to include as members of the LGBTQIA+ community, whom to vote for, how to present oneself, and countless other debates flood the timelines of many queer people involved in online discourse. What most members of the LGBTQ+ community today do not realize is that this proclivity to inter-group conflict is nothing new. LGBTQ+ historian, librarian, and co-founder of the Gay and Lesbian Archives of Mid-America Stuart Hinds states conflicts similar to the ones faced today can be found “taking place on the pages of a magazine, not on Twitter, not on some more ephemeral kind of tool” (Hinds). The magazines he refers to are the publications widely prevalent during the early homophile movement, such as *ONE*, *The Mattachine Society*, and *The Ladder* (Hinds). He further notes that the post-Stonewall groups “would not have been nearly as successful had it not been for the network that had been established by the pre-Stonewall homophile activists . . . in large part by the pages of those magazines” (Hinds).

One contributor to these precedent-setting publications was Kansas City resident Barbara Grier. From 1957 to 1972, Barbara Grier was a prolific writer, anthologist, and editor for the San Francisco-based lesbian literary magazine *The Ladder*, all while living a deeply closeted existence in Kansas City, Kansas (Passet 259-262). During her time as a contributor, Grier was often seen as a formidable force, not only known for frequently inciting academic, theoretical, and personal conflict but for publishing it. As a lesbian woman, her conflicts can be analyzed using co-

cultural communication theory, which states that oppressed people have a distinct way of engaging in conflict as a result of their marginalized status (Oetzel and Ting-Toomey 643). As a contributor and editor for *The Ladder*, Grier sustained many conflicts with other members of the early homophile movement, such as Frank Kameny, Barbara Gittings, and Jane Rule. Analyzing Barbara Grier's conflicts through the lens of co-cultural communication theory affords further understanding as to why intergroup conflict in the LGBTQ+ community has both historical and present-day prominence.

The Co-cultural Theory of Conflict Communication

Developed by interpersonal communications researcher Mark P. Orbe, the co-cultural theory is an "eclectic approach to communication theory in that it draws from various existing conceptual frameworks related to culture, power, and communication" (Orbe 8). More specifically, the co-cultural theory derives from the anthropological "muted-group theory" and the sociological "standpoint theory" (Orbe 8). The muted-group theory, often used in feminist academia, asserts that "groups that function at the top of the social hierarchy determine to a great extent the communication system of the whole society" (Orbe 8). As a result, those outside the dominant group are seen as unintelligent and ineffective communicators, making them the "muted-group" (Orbe 9). The standpoint theory, also derived from feminist research, recognizes that those in "subordinate positions" maintain a "specific societal capacity that serves as a subjective vantage point from which persons interact with themselves and the world" (Orbe 10). As a result, those in subordinate positions interact with the rest of the world differently than those in more dominant positions. According to Orbe, the assumptions predicated by these theoretical frameworks provide the basis for the co-cultural communication theory (Orbe 10).

Within the context of co-cultural communication, there exists "communicative practices" that make up the "hows and whys of co-cultural communication" (Orbe 86-87). The reasons for choosing a particular method of communication rely on multiple factors, but ultimately on the individual's "preferred outcome" (Orbe 89). While Orbe recognizes that many, if not the majority, of communication choices are fluid and situational, the outcomes are often narrowed down to "assimilation,

accommodation, and separation" (Orbe 89). With assimilation, this choice often results in "non-dominant group members, . . . minimizing any differences to the point of marginal insignificance" (Orbe 91). People who accommodate take a more liberal approach; instead of attempting to ascribe to the societal standards that oppress them, they instead choose to modify them and orient towards promoting inclusivity and acceptance as "meaningful, valuable, and legitimate" individuals (Orbe 92). Last, separation as a preferred outcome takes a more drastic approach, resisting the "notion of forming a common bond with dominant group members" (Orbe 92).

In the case of the LGBTQ+ community, a variety of behaviors may occur. If someone has a more assimilationist view towards interacting with people in power, they will typically behave in ways that will appease the oppressive system (Oetzel and Ting-Toomey 643). For Grier, this view manifested in her belief that to achieve civil rights queer women needed to maintain "lives beyond reproach" so that the systems of power would see them as morally sound (Passet 119). People who are more accommodating when engaging with systems of power will try to lobby for civil rights, such as by picketing or holding public demonstrations for equality, while people who are separatist reject the oppressive systems of power and disassociate with them almost completely (Oetzel and Ting-Toomey 643). In tandem with the concept of preferred outcomes are the "communication approaches," which can be "aggressive, assertive or non-assertive" (Orbe 104). Together, these concepts form the individual's "communication orientation," which, in turn, results in varied communication styles within a non-dominant subgroup (Orbe 108). For example, an aggressive separatist would have a very different preference for how to best interact with systems of power than a non-assertive assimilationist. In the case of Barbara Grier and the other conflict-prone homophile movement writers, these variances provide one possible framework for understanding the conditions in which inter-group conflict ensued.

Barbara Grier: Early Life

On November 4, 1933, Barbara Grier was born to Philip S. Grier and Dorothy Vernon Black in Cincinnati, Ohio (Passet 259). While Grier's childhood was one of struggle and inconsistency, Grier came out as a

lesbian to her mother at age thirteen, her mother gave her two pieces of lesbian literature as a token of support (Passet 10-11). After years of her chronically unemployed father uprooting their family, Grier moved to Kansas City, Kansas, and graduated from Wyandotte County High School in 1951 (Passet 259). Looking back, Grier recalled transferring to Wyandotte County High School after getting “caught making out with another girl in the teacher’s lounge” (Passet 15).

After high school, Grier did not attend college, but her fascination with literature led her to the Kansas City Public Library (Passet 16). There, she met librarian Helen Bennett, and the two became lovers and life partners by the fall of 1952 (Passet 18). As a couple, Bennett and Grier led an extremely closeted existence, which was relatively common for many LGBTQ+ people in Kansas City at this time (Passet 19). At this point in US history, homosexuality was classified as a disease, was associated with communism as a byproduct of McCarthyism, and homophobia was rampant in many areas of the country (Passet 19). In 1956, Grier met University of Kansas City professor Jeanette Howard Foster, a former librarian for sexologist Alfred Kinsey (Passet 22). Soon after, Grier became Foster’s protege in the pursuit of lesbian literature, and it was through this mentorship that Grier would be introduced to *The Ladder* in 1955 (Harker 19; Passet 22).

The Daughters of Bilitis and *The Ladder*

In September 1955, Rose Bamberger, Del Martin, and Phyllis Lyon began the “Daughters of Bilitis”— a lesbian women’s social club—in San Francisco (Passet 26). The Daughters of Bilitis (or the DOB) was a very private group, often meeting in “one another’s homes . . . so fearful of public exposure that they hesitated to exchange last names and phone numbers” (Passet 27). While the social club garnered many enthusiastic members, what had more of an impact was that of their monthly newsletter, *The Ladder*. When the first issue was released in October 1956, subscriptions to the publication quickly grew higher than that of membership to the social club, with the DOB claiming fifty-five members and *The Ladder* claiming four hundred subscribers by the end of 1957 (Passet 27). This readership was likely due to the anonymity of the paper, which allowed many queer women to see themselves represented in its pages without having to face the safety issues associated with coming out

of the closet. While access to a magazine publication featuring queer people may be relatively commonplace in 2023, Hinds notes that while publications like these were risky, they undoubtedly “further established the foundation for the rights that queer people take for granted today” (Hinds). Despite the long-standing benefits of this publication, it was relatively assimilationist, beginning by “advocating a mode of behavior and dress acceptable to society” (Vigiletti 59).

Jeanette Howard Foster, Grier’s mentor, alerted Grier of the publication in 1957, and by August of that same year, Grier became one of its most devoted followers and contributors (Passet 27, Harker 19). Because of their ability to reach a large audience, “*The Ladder* and the other two homophile organizations and magazines . . . were completely instrumental in the formation of a national movement” (Hinds). Hinds further remarked that these magazines were on the “cutting edge of activism” and that *The Ladder* and other similar magazine publications helped “organize the path” for queer rights activism (Hinds). In a time of immense fear and exclusion, these magazines were pivotal for closeted homosexuals in unsafe communities, and from her home in Kansas City, Barbara Grier was no exception.

Barbara Grier: Catalyst of Conflict

In August 1957, Grier sent her first letters to *The Ladder*, and she was published for the first time later that year (Passet 27). During her time with *The Ladder*, she would go on to publish 211 pieces using varying pen names to give the illusion that more people were involved in the publishing process than in reality (Passet 28). Gene Damon was her most common pen name, and Grier used many pen names during her time as a writer that were often modified from the names of her family members (Passet 28). While Grier was frequently published over the course of her many years of involvement, her writing and opinions were not always widely well-received. Using Orbe’s co-cultural theory of conflict as an analytical tool, it is likely that many of these conflicts stemmed from the fact that Grier’s communication orientation varied from the other individuals involved with the publication.

Many personal attributes point to the fact that Grier’s preferred outcomes and communication approach would categorize her as an aggressive assimilationist. One sign can be found in her more flippant

attitude toward original paperback novels being included in the lesbian literature genre. Whereas many saw these novels as holding the queer community back because of their over-sexualization of the lesbian community and minimal literary value, Grier saw them as “printed affirmation of gay and lesbian existence even though they often reinforced negative stereotypes” (Passet 79). In her anthology *The Lesbian South*, Jaime Harker stated that Grier “was drawn to accessible narratives and valued the popular for the cultural work it performed, especially for lesbian readers” (18). Additionally, although a devoted follower of *The Ladder*, Grier frequently criticized the DOB for its approach to achieving social change. Joanne Passet, author of *Indomitable: The Life of Barbara Grier*, remarked that Grier believed “one good issue of *The Ladder* would accomplish far more than all of their meetings and conferences and groups combined” (qtd. in Passet 92).

In Grier’s further critiques of the Daughters of Bilitis, Grier wrote that these women “have either militant (let’s burn queers in the streets) or lazy (let’s all have a fuck-in to show how liberated we are)” (qtd. in Passet 96). This statement shows that not only did she disapprove of the *laissez-faire* attitudes of some queer separatists, she also did not approve of the headstrong nature of the queer accommodationists, leaving the most likely orientation as an assimilationist. Lastly, signs point to Grier’s assimilation in her own writing. In a 1958 essay she wrote under the pen name Gene Damon, Barbara demonstrated how she believed the best way for lesbians to achieve acceptance was to exemplify morality, stating “it is possible if you love enough.” Referring to her ability to own a home and live a life with her partner, she ignored the reality that this way was not a possibility for many LGBTQ+ people at this time (Damon n.p.).

While it is clear by analyzing both her published and personal writing that Grier’s preferred outcome was almost always to assimilate, she is perhaps more well-known for her aggressive communication style. When questions about her emotional volatility were posed, Stuart Hinds stated that it was “Barbara’s way or the highway” and that when he spoke to her over the phone, he could “hear it in her voice and demeanor” (Hinds). From the comfort of her home in Kansas City, Grier would use her words as a weapon when writing. In an argument with her editor, Barbara Gittings, she stated, “I feel that I am drinking the ocean in order to pee into a funnel” (qtd. in Passet 79). In reference to the Daughters of Bilitis and

The Ladder becoming separate entities, she stated that the “DOB (for all I care after two years of hard slavery) can go to hell” (qtd. in Passet 106). However, the most evident examples of Grier’s militant conflict approach can be found by analyzing the specific conflicts she engaged in during her time working for *The Ladder*.

Critics of this assessment may say that the co-cultural theory limits historical actors from being viewed as three-dimensional people or that Grier simply had a disagreeable personality. While the dimensions of the co-cultural theory are often more dynamic, the co-cultural theory can serve as a broad-stroke assessment for understanding the situations that preceded intergroup conflict within this community. Perhaps, with a better understanding of how the conditions and circumstances shaped these conflicts in the past, there can be more understanding gleaned for why similar conflicts continue into the present day.

Barbara Grier, *The Ladder*, and the Conflicts That Ensued

In early 1963, Barbara Gittings became the editor of *The Ladder* (Passet 39). Initially, Grier was receptive to Gittings’ editorship; however, a conflict between the two women emerged quickly. As editor, Gittings frequently tested the more assimilationist approach that the Daughters of Bilitis and Grier had relied on for many years. (Passet 41). One of the major conflicts between these two women involved Grier’s usage of original paperback novels (PBOs) in her lesbian literature review *Lesbiana* (Passet 78). Gittings requested that Grier not use PBOs in the review, but Grier believed these books were extremely important pieces of queer literary culture (Passet 78). On the other hand, Gittings saw these texts as being “directed by the publishers to serve a male audience a vicarious thrill” (qtd. in Passet 79). When considering the co-cultural theory, Gittings’ desire to exclude these paperbacks demonstrates an unwillingness to subscribe to the social limitations for queer people and suggests that she would be closely aligned with the accommodationist point of view. When analyzed with the co-cultural theory in mind, the disagreement from editor to writer shows that the propensity towards disagreement was motivated by differences in communication orientation.

Even before she began her career with *The Ladder*, Grier was what Jaime Harker describes as an “obsessive lesbian bibliophile” (Harker 19). As a result, Grier was obsessed with almost any author of lesbian

fiction she came across. In 1964, this obsession led her to *Desert of the Heart* author Jane Rule (Passet 54). In 1964, Barbara wrote Rule a fan letter and was able to meet with the author when she passed through Kansas City (Passet 54). After this meeting, Jane Rule and Grier maintained a long paper friendship but disagreed on many things when it came to queer literature. In 1967, an anonymous donor commissioned Grier to write an anthology entitled *The Lesbian in Literature* (Passet 84). In this anthology, Grier analyzed any and every text that she could find on lesbians, including the infamous PBOs. Jane Rule criticized her inclusion of the original paperbacks in the anthology, noting that they were “devoted to keeping worthless titles alive” (qtd. in Passet 85). Barbara took to the defensive, stating, “*The Lesbian in Literature* was not the lesbian in good literature or so-so literature, or in some certain portion of literature” (qtd. in Passet 85). While the two women never came to an agreement, this was not the last of their many conflicts during their long friendship, and Rule eventually stated “perhaps kindness is found in silence” (qtd. in Passet 85). Their conflict is marked by their differences in interactional goals. While Grier embraced the paperback originals as a form of assimilation, Rule outright rejected them as a form of separatism.

During the earlier years of Grier’s writing for *The Ladder*, these clashes often took place via letter-writing; however, this would change in 1966 when the National Planning Committee of Homophile Organizations met in Kansas City (Passet 46). Previously, Grier had been fairly removed from the queer political organizing scene, but it was here that she encountered Frank Kameny, with whom she disagreed about whether picketing and protesting were effective routes to fostering social change (Passet 46). Known for dismissal from the Army for being gay in 1957, Kameny was entrenched in a life of accommodationist activism, using methods of which Grier did not approve (Passet 46). Her ideal method was “to live a life beyond reproach, and to show that gays and lesbians were superior individuals,” whereas Kameny frequently picketed to achieve gay civil rights (Passet 46). In her conflict with Kameny, Grier stated, “[picketing] will no doubt get you the law reform you want . . . [but] will set back the social progress of the homosexuals another 100 years” (qtd. in Passet 47). The conflict between Grier and Kameny exemplifies the co-cultural theory. Whereas Barbara was an aggressive assimilationist, Kameny was more of an assertive accommodationist.

The Ladder's Fall

In 1968, Grier assumed the role of editor for *The Ladder*, which came with its own set of challenges and conflicts (Passet 92). During this time, *The Ladder* was transformed into a lesbian women's club magazine and started operating under a more lesbian-feminist milieu. In a letter to Barbara Gittings, Grier states, "I do feel that woman [sic] can THINK as WELL AS LOVE" (qtd. in Passet 103). It was this shift that led to the separation of the DOB and *The Ladder* (Harker 23). In 1970, with the assistance of DOB President Rita Laporte, the addresses of all the DOB members were stolen, or arguably liberated, from the DOB, and *The Ladder* became a separate entity (Harker 23). Laporte and Grier continued the publication until August 1972, when they could no longer financially continue (Passet 112). While this financial problem ended publication of *The Ladder*, it was not the end of Grier's prolific career in the field of lesbian publication. Prior to her death in 2011, Grier managed a lesbian publishing company called Naiad Press, would publish several editions of *The Lesbian in Literature*, and would receive the Lambda Literary Pioneer Award and Publisher's Service Award, all while maintaining her belovedly brash sense of self (Passet 262-264).

Conclusion

Using the theory of co-cultural communication theory to analyze the many conflicts Grier engaged in during her time working for *The Ladder* provides a deeper understanding of why these conflicts occurred in the first place. Through the co-cultural lens, perpetual conflict and communication difficulties can be viewed not as personality flaws on behalf of the queer community but as "responses to dominant societal structures that label them outsiders" (Orbe 87). Conflicts such as the ones of the homophile movement still widely exist among members of the LGBTQ+ community and are often due to differences in communication orientation. These types of conflicts can be frustrating, divisive, making the path to achieving queer liberation feel daunting. So while Grier is not a catchall example of how conflict permeates in the LGBTQ+ community, viewing her as a historical actor and analyzing her choices through the co-cultural lens can provide perspective for modern-day community members who feel as though the queer community will never be in agreement. Rather, by analyzing the history of the LGBTQ+ community

through the lens of in-group communication styles, perhaps it is possible to understand the current debates among members of the queer community from a more comprehensive and progressive point of view.

Works Cited

- Damon, Gene. "Lesbian Marriage." 1958. *HOMOSEXUALITY: Lesbians and Gay Men in Society, History and Literature*, edited by Leslie Park, Arno Press, 1975.
- Harker, Jaime. *The Lesbian South Southern Feminists, the Women in Print Movement, and the Queer Literary Canon*. 2018. The University of North Carolina Press, 2018.
EBSCOhost, search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=nlebk&AN=1902492&scope=site.
- Hinds, Stuart. Personal interview. 15 Mar. 2023.
- Oetzel, John G., and Stella Ting-Toomey. *The SAGE Handbook of Conflict Communication*. 2nd edition., Sage Publications, 2013.
EBSCOhost,
search.ebscohost.com/login.aspx?direct=true&AuthType=sso&db=cat09210a&AN=umkc.oai.edge.umsystem.folio.ebsco.com.fs00001083.553575d2.654f.50dc.9a04.67006cbecc9c&scope=site.
- Orbe, Mark P. *Constructing Co-cultural Theory: An Explication of Culture, Power, and Communication*. Sage Publications, 1998.
- Passet, Joanne. *Indomitable: The Life of Barbara Grier*. Bella Books, 2016.
- Vigiletti, Elyse. "Normalizing the 'Variant' in *The Ladder*, America's Second Lesbian Magazine, 1956–1963." *Frontiers: A Journal of Women Studies*, vol. 36, no. 2, Jan. 2015, pp. 47–71. EBSCOhost,
<https://doi.org/10.5250/fronjwomestud.36.2.0047>.

Denazification of West Germany, 1945–1950: US Disappointment and Justifications

Emma Nowotny

The defeat of the Axis Powers in World War Two resulted in the occupation of Germany by the Allied powers. Due to the many crimes of Germany's Nazi regime, the Allies deemed it necessary to implement a denazification program during their occupation. The Allies agreed that before Germany could be a self-governing country again, their government, society, and institutions needed to be purged of Nazism. The foremost Nazi leaders, and the hundreds of thousands of lesser-known Nazis, needed to be held accountable for genocide, war crimes, and the many atrocities at home. By 1950, the denazification campaign succeeded in banning the Nazi Party and convicting the most well-known perpetrators of the Holocaust, but it also left thousands of "former" Nazis untouched in high positions in West Germany. More importantly, it allowed many high-ranking Nazi officials into positions of power in postwar Western institutions. Kurt Waldheim was an officer in the *Sturmabteilung* (paramilitary) and the *Wehrmacht* (army) who became Secretary General of the United Nations;¹ Adolf Heusinger went from colonel in the *Wehrmacht* and personal associate of Adolf Hitler to chairman in NATO and advisor to Konrad Adenauer;² Walter Hallstein was a *Wehrmacht* officer who later became President of the European Commission in the European Union;³ Emil Augsburg was a top architect of the Holocaust who was allowed to escape justice in Poland by joining the C.I.A.⁴ This pattern suggests that not only were top Nazis avoiding justice, but that they also were aided in doing so by the leaders of these Western institutions. In this and other ways, the denazification program ultimately fell short of its ostensible goals of bringing an end to fascist power in Germany and justice to the victims of the Nazi regime.

Literature on the topic of denazification in Germany seems to focus far more on the process and effect of the campaign than the public reaction. In *From Crusade to Hazard*, Bianka Janssen studies the case of denazification efforts in the city of Bremen, concluding that "it fell victim to its own ambition and collapsed underneath the weight of its

administrative processes, leaving both the Americans and Germans involved in the program demoralized and disillusioned.”⁵ Many writers, including Janssen, also discuss the cultural aspect: that many Western commentators and policymakers believed something inherent to the German people made them naturally aggressive and authoritarian. Henry Morgenthau, the denazification architect in US President Franklin D. Roosevelt’s cabinet “believed in the collective guilt of all Germans because he was convinced that Nazism, militarism, and aggression were inherent to the German national character.”⁶ Writing in the journal *German Politics and Society*, Anton Kaes emphasizes the prevalence of this idea in the American debate over the fate of postwar Germany: “The discourse had at its core an essentialist search for a national character that, given the circumstances, could only be articulated in medical terms.”⁷

Frederick Taylor highlights economic and anticommunist motivations for swift, lenient denazification, arguing it impeded efforts to economically reintegrate the four occupation zones of Germany, and that a weakened, divided Germany served the cynical interests of the Soviet Union.⁸ Tom Bower takes a more critical view, more skeptical of the Western powers’ justifications and intentions. In his book, *The Pledge Betrayed*, he posits, “Only a dwindling handful would have the stamina, courage, and conviction to pursue the justice for which the war had ostensibly been fought. At the end it would seem as if the Allies turned a callous and blind eye to the murder of twelve million Europeans.”⁹ Bower is an exception to the pattern of writers taking a more forgiving view of denazification efforts by focusing on the many struggles of the implementation of denazification rather than starting from a position more skeptical of the Allies’ intentions.

Two other scholars address the topic of denazification in the United States. Within his broader history of the denazification of Germany, Perry Bidiscombe explores the debate amongst the official American planners and theorizers of denazification in the wartime years. He finds misguided planning and division amongst planners significantly contributed to the failure of denazification.¹⁰ Antonio Thompson studies the denazification of 425,000 Axis prisoners of war in camps in the United States. In the chapter “Exorcising the Beast: Reeducation of German POWs in America,”¹¹ he argues that the reeducation of 30,000 POWs in “democratic values” was successful despite many constraints, such as the

Geneva Convention's disallowing of "denationalization" of POWs, and argues that after repatriation, these Germans would aid in the denazification of their home country.

The existing historiography in the field of denazification is wide in scope but lacks study of the various ways different sections of the American public reacted to the deterioration and result of the program in West Germany. Scholars have examined the process of the implementation of the program;¹² the theories that informed denazification;¹³ the reaction of, effect on, and resistance by the German population;¹⁴ and the role that different groups played in denazification, like the Christian churches in Germany,¹⁵ the occupying militaries,¹⁶ and Allied intelligence agencies.¹⁷ Much attention has also been given to higher-profile phenomena, including the Nuremberg Trials and the pursuit of notorious Nazis across the world over the next several decades, like Mossad's capture of Adolf Eichmann from Argentina in 1960. The research in this paper concerns neglected areas of American public reaction: grounds for dissatisfaction from some and reasons for opposition from others.

This paper's analysis of journalistic sources will show that US writers from a variety of backgrounds expressed their disappointment with the progress of the Allies' denazification program in West Germany on the grounds that it acted as justice to too few Nazis and that punishments were often too lenient to result in a true denazifying of Germany. Additionally, other American voices from a more powerful or business-oriented background spoke out against a more rigorous application of denazification, downplaying the continued relevance of Nazism in postwar Germany and arguing that denazification distracts from bigger priorities of Cold War preparedness and economic rebuilding.

A study of US newspaper stories from 1945-1950 shows a variety of perspectives on the denazification program. This paper analyzes writers who supported the ideals of denazification and were dissatisfied with the poor execution and limited results of the campaign, including Jewish authors and journalists who were in Germany during denazification. This paper then addresses articles that give the reaction of a smaller number of Americans who opposed denazification. Articles are analyzed for their perspective, their argument, their evidence, and information they relay about their subject. Research outside the

newspaper source provides background on the author of the article and helps determine how the source should be analyzed. Primary sources were chosen for how well they represent the three US perspectives studied in this paper, which constitute the three sections of the following analysis.

American Jewish Reaction

A 1950 article in *The Southern Jewish Weekly*, for which no author was named, took a strong stance in favor of further denazification. Titled "Denazification Farce: The Bribery and Corruption of the Courts Have Made it Dangerous to be an Anti-Nazi"¹⁸, it began by telling a German joke about a man passing his denazification trial a little too easily: "I came to the court and shouted: 'Heil Hitler!' The presiding judge, a fine fellow — he used to be my SS Obersturmfuehrer— answered back: 'Heil Hitler! You are denazified!'"¹⁹ The joke relayed frustration at lack of rigor in the program's process of removing and trying German Nazis, suggesting people in charge of denazification were disposed towards fascism. The joke was not shared lightly: "that example of German humor isn't funny; it is too close to the truth for that."²⁰ It showed a fear held by antifascists from the United States to Germany, that Nazism was being rehabilitated and its adherents pardoned. The author gave evidence of the untrustworthiness of the current denazification operation, ". . . in round numbers, about 500 major criminals were found guilty. Yet the records declare that there were at least 80,000 important SS, Gestapo, and party officials. Comparing the two figures, one must question the judicial efficiency of the denazification courts."²¹ The author also listed many important Nazis who had their sentences dropped or greatly reduced, including Hitler's financier, Hjalmar Schacht; the conservative chancellor who opened the doors to Hitler's rise to legitimate power, and later served him as diplomat, Franz von Papen; and the leader of American Nazi group called the German-American Bund, Fritz Kuhn.²² This article catalogues popular dissatisfaction with the apparent failure of denazification. The world was promised that Nazism would be purged from social and political life after having been defeated militarily, but people could see by 1950 that this promise was not materializing.

Another article offering the US Jewish perspective was "End of Denazification,"²³ by Gerhard Jacoby, who wrote in *The Wisconsin Jewish*

Chronicle in July of 1949. As given by the note before the article, Jacoby was a prolific Jewish author who had previously studied Nazism and was a member of the Institute of Jewish Affairs. He believed "the program began by sincerely trying to wipe out Nazism and bring democracy to Germany,"²⁴ but that by 1949, "a policy is being instituted which allows, and even encourages, a resurgence of German nationalism, which is, de facto, Nazism."²⁵ He gave a basic history of the denazification campaign, highlighting its deterioration by successive policy changes that made it ever more lenient and ineffectual. After the principles of denazification were established at the Potsdam Agreement and the Yalta Agreement, which Jacoby quotes as promising that the Allies would "remove all Nazi and militarist influence from public office and from the cultural and economic life of the German people."²⁶ The deterioration, however, began when the responsibility of denazification was transferred from the US to German authorities. In March and October of 1946, the Allied occupation governments issued directives which declared that "this ultimate goal could be achieved only if the Germans participated and shared responsibility for the administration of their own affairs,"²⁷ and "empowered . . . German tribunals for classification, trial, and review."²⁸ This shift in policy led to a series of relaxations of the denazification process that gave amnesty to more and more Germans. In 1946, the courts granted amnesties to two million Germans who were under investigation. This act was due to two new rules, the "Youth Amnesty" and the "Christmas Amnesty," which respectively freed any Germans who were classified as Nazi "followers" and were born after 1919, or "followers" who were disabled or in a lower income group. Meanwhile the courts postponed the cases of many more important Nazis.²⁹ In 1948, the denazification courts began processing tribunals through "postcard trials," written judgments without a formal trial, in which the only penalty possible was a fine in Reichsmark. Not only "followers," but "offenders"³⁰ could have a "postcard trial," which greatly increased their chances of an amnesty or a light sentence.³¹

Jacoby shared a disturbing incident that showed how compromised and undedicated to denazification the German-run courts had become: "When a Jewish witness for the prosecution testified on his years of suffering at the Oranienburg concentration camp (near Berlin), the Chairman, a former German Ambassador, remarked calmly:

'Nevertheless, you have survived,' and the audience roared with laughter."³² The former ambassador in this anecdote was one of many examples in the pattern of "former" Nazis who wielded the power of judging in denazification trials. Jacoby found that "former Nazis and Nazi supporters did not hesitate to accept these jobs. There were several cases where victims recognized their former tormentors in the person of the denazification judge."³³ When at last it came time to try the "major offenders," those who had held high positions in the party, the SS,³⁴ the Gestapo,³⁵ or other powerful Nazi organizations, the farcical nature of the courts showed. This problem was especially relevant when "the major offenders acted as mutual exonerating witnesses by 'deposition on reciprocity'. He who was a witness today was a defendant tomorrow and vice versa."³⁶ Finally, Jacoby reached the results of failed denazification, as of mid-1949, by studying "authoritative unofficial reports and news releases."³⁷ He found that 11,000 Bavarian teachers fired for Nazism had been reinstated and over 80% of judges and public prosecutors in Bavaria were once Nazi party members. In Schleswig-Holstein, that same statistic was more than 90%, despite that state having a "Social Democratic majority and a purely Social Democratic Government."³⁸ In the West German government, "Former aides of Ribbentrop's Foreign Office corps are already recruiting a Foreign Office staff, confident that they will soon be restored to their former positions."³⁹ Like many other writers, Jacoby also expressed dismay at the story told by the total numbers that came out of denazification. In the end, Jacoby found that while the courts prosecuted 3.25 million cases, amnestied 2.5 million of them without trial, and sentenced 8,703 to labor camps and fined 546,681.⁴⁰

Along with socialists, the Jewish population of Europe was the primary target of the Nazi's propaganda and atrocities. Antisemitism was a central aspect of the Nazis' ideology and program since the party's founding in 1920, and the party worked tirelessly to foster and spread antisemitism in Germany and to audiences across the Western world. During the Holocaust, the Nazis killed at least six million Jews and forced many more to flee their homes. It is plain to see why US Jews would have been more likely than other US citizens in the 1940's to advocate for a more thorough and robust denazification program for the Allies to enact in occupied Germany. Gerhard Jacoby and the unnamed writer for *The Southern Jewish Weekly* expressed a sentiment that was likely very

common amongst US Jews who were paying attention to the attempted denazification of the society that had spent the previous two decades committing genocide on their European counterparts—a sentiment of deep dissatisfaction and disappointment.

Two Prominent Journalists

Many prominent non-Jewish journalists in the US showed no less ire at the failure of denazification. Ernest Leiser was a young military correspondent who would later become famous for his investigative journalism of the Cold War and who also contributed greatly to the rise of CBS as a major news organization.⁴¹ Leiser was likewise let down by the result of denazification, shown when he wrote of the process a “New Hitler-like Politics in Germany”⁴² for *The Santa Rosa Evening Press* in 1949. He assessed the progress of the program in the American Occupation Zone after four years of denazification, and three years since the Law for Liberation from National Socialism and Militarism was promulgated by the US, giving much of the power and responsibility of denazification to German authorities. On the positive side, he reported that “More than 620,000 have been found guilty in some measure. More than 560,000 were fined (albeit in inflated Reichsmarks),⁴³ 24,000 had their property confiscated in some measure, 22,000 barred from public office, 122,000 restricted in employment—and more than 9,000 sentenced to labor camps, even if for such short terms than only 700 are still serving time.”⁴⁴ Leiser claimed that denazification did not live up to the pre-war promises of the Allies, who entered Germany under “Directive 1067 of the Joint Chiefs of Staff,”⁴⁵ which Leiser quoted as declaring that “‘all active supporters of Nazism or militarism and all other persons hostile to Allied purposes’ should be kicked out and kept out of public office and from positions of importance in quasi-public and important private enterprises.”⁴⁶ He contrasted this intention with the reality that “‘there are many ‘active supporters of Nazism or militarism’ who are today back in public office, principally at local levels still, and in prominent private posts. They include ‘middle-sized’ Nazis or persons who, though not prominent in the party itself, financed Hitler or aided and promoted the Nazi state.’”⁴⁷ He concluded with a resounding condemnation of the program, saying, “It is impossible to view the completed U.S. denazification program with anything other than the deepest disappointment and

dissatisfaction."⁴⁸ He cited no cause for the failure of the program, only noting that the German population had quickly grown weary and resentful of it. Leiser's review of denazification shows that many in the United States were monitoring the progress of denazification and found it unsatisfactory compared to the degree of denazification they were promised in 1945 and during the war.

In "U.S. Denazification Program a Failure", another article of his from 1949, Ernest Leiser considered reasons for denazification's failure, identifying Lieutenant General Lucius Clay, U.S. Military Governor and "an architect of denazification"⁴⁹, as a significant negative influence. Leiser was in West Germany and interviewed Americans and Germans who worked in the denazification program, and found that, "Not one hesitated to concede, in most instances with bitterness, that their mission had failed in large degree."⁵⁰ Despite the popularity of this opinion amongst his own workers, Clay insisted denazification was a success, as Leiser quoted him declaring, denazification "was one of the greatest programs of its kind carried out in the world . . . , we may count on the denazification measures to keep out of office for a long time the really bad Nazis so that other leadership can develop, and that if the Nazis try to come back, it will be too late."⁵¹ Leiser contended that Clay's decision to expedite the program resulted in hasty trials and lenient judgements as "middle-rank Nazis were . . . , classified as mere 'followers,' and given nominal fines and released."⁵² Leiser also blamed Clay's implementation of a "mass judgement" process that involved prioritizing for trial the millions of rank-and-file Nazis over the lesser amount of more powerful, higher-profile Nazis for the failure of denazification. Leiser explained, "By the time the important figures were tried, interest in the proceedings had vanished and an uncooperative resentment had taken its place,"⁵³ the result being, "the Nazis are now coming back to a disturbing degree, the 'major offenders' and 'offenders' have not been sufficiently isolated from the population as a whole, and the feelings of guilt and political repentance . . . , have been dissipated entirely."⁵⁴ Leiser did not venture to guess why Clay made these decisions, except that he was trying to "meet a tentative target of June 1"⁵⁵ which was not reached, "not by several months."⁵⁶ It could be that the lieutenant general was hoping to produce impressive results for his superiors and advance his own career, or that he was pressured to wrap up the program by Western elites who wanted to save Nazis from justice so they could put

them to use in waging the burgeoning Cold War, as evidenced in the many instances of Nazis holding prominent positions in such institutions as NATO,⁵⁷ the CIA,⁵⁸ NASA⁵⁹ and West Germany's army, the Bundeswehr.⁶⁰

Like Ernest Leiser, Landrum Bolling was a young, critical American journalist in the European theater of World War II in the 1940's. Before covering denazification in West Germany, he was the first to uncover a massacre of Algerians that French colonial authorities attempted to hide and thereafter committed his life to peace activism, working in the U.S. Institute of Peace.⁶¹ Bolling wrote "Bitterness And Danger Are Legacies Of Bungled Denazification Program" in 1948 for York, Pennsylvania's *The Gazette and Daily*. He relayed a "grim jest"⁶² of how American denazification officials reference their "'re-Nazification' program,"⁶³ and how officials complained of non-Nazis being fired from employment in government and industry to make way for hastily-denazified former Nazis, who were also being fully restored to "their previous rank and seniority rights."⁶⁴ He criticized the implementation of the program on similar grounds as Leiser, highlighting the mistake of giving Germans too much authority in the denazification courts, as well as focusing on the large number of lesser offenders over the higher-profile cases. As a result, "the whole denazification project has been brought into general disrepute among the Germans. Moreover, probably a majority of Military Government officials are themselves opposed to the program as it has worked out."⁶⁵ Also like Leiser, his final assessment of denazification was in very negative terms: "The evil effects of the mishandling of this clean-up job will remain to haunt Germany and the Allies for a long time to come."⁶⁶ Bolling exhibited a regretful tone throughout his article, and frequently referred to the American denazification workers' dissatisfaction.

Leiser and Bolling's journalism show the disappointment of multiple groups: their own, like-minded US citizens, as well as US citizens in West Germany directly involved with denazification. These people were dissatisfied because denazification failed due to implementation problems they could plainly see but could do little about. Specifically, the only thing they could do was point out what they saw: farcical tribunals, unpunished Nazis, decreasing regard for denazification in US policy, frustration and resentment amongst the German population. Writers and speakers didn't have to be Jewish to desire justice for the Holocaust, no less than they had

to be socialist, Roma, disabled, gay, or transgender to desire justice for those peoples massacred by the Nazi regime. Considering the extent of Nazi atrocities and the great lengths taken by the Allies to defeat them militarily, it is clear to see why the average US citizen would have sought thorough justice against the perpetrators and measures taken to guarantee the uprooting of fascism and be audibly disappointed when the denazification program implemented after the war gave them neither of these. Yet, despite the strength of the drive for justice and fear of fascism, there were some US citizens willing to overlook these concerns in favor of other priorities.

Opposing Denazification

A smaller group of US citizens opposed denazification and was pleased to see it fail and be phased out by the occupying Allies. These people included some in the US business community, people chiefly concerned with the strength of the German economy, and people in US leadership in Germany, who were represented by George S. Patton. An Associated Press story in the *Washington Evening Star* in 1951 shows the friendly relationship between the Third Reich and the Allied authorities with a wealthy Nazi capitalist. The story reports "German multimillionaire Hugo Stinnes"⁶⁷ was investigated for six years by the Allies, and the result was that "Stinnes himself submitted a plan for deconcentration of his vast holding and it was accepted by the Allies , , , it is believed that Stinnes will come out of the reorganization still one of the wealthiest men in Western Europe"⁶⁸ despite the fact that "a 1945 Army press announcement described Stinnes as "one of the very worst forces in Germany."⁶⁹ One can only imagine what kind of amiability existed between Stinnes and the Allies for such a lenient decision to come from six years of investigation into one of the Third Reich's wealthiest capitalists. Given the close connection between Nazism and capitalism, such a prominent industrialist could not have lived through twelve years of Hitler's rule without supporting, and being supported by, the Nazi Party. Yet not only was Stinnes spared criminal punishment, he was also allowed to dictate to the Allies his own fine and continue living with no less standing in West Germany than he had in the Third Reich. This news shows the continuation of the Nazi status quo into the postwar era.

A finance newspaper provides us with an American viewpoint very different from Jacoby, Leiser, and Bolling. An edition of *Barron's National Business and Financial Weekly* from 1947 relays the opinions and reasoning of those who opposed denazification on economic and practical grounds. The unnamed author bemoaned the disruption to the German economy that the denazification program had resulted in as the trials consumed resources and banned many convicted Nazis from employment. The author did not speak at all to the necessity or righteousness of denazification, but only to the alleged overzealousness of the Allied occupying authorities and the negative consequences of the denazification campaign, claiming, "they try to enforce denazification orders that merely contribute to chaos."⁷⁰ The author characterized the push for denazification as being of a "purely political nature"⁷¹ and encouraged by Soviet propaganda. The article was highly dismissive of arguments for denazification and assumed of them a cynical motivation. This newspaper was published by Dow Jones,⁷² who also publishes the *Wall Street Journal*. The negative portrayal of denazification in favor of economic priorities is indicative of the views of a section of American society different from those represented by Jacoby, Leiser, and Bolling. The wealthier, non-marginalized US citizens would have had less disagreement with Nazism and less desire for justice, and thus saw denazification only for its economic consequences, not as a goal worth pursuing.

Leiser's reporting on Lucius Clay was not the only coverage of a US general in Germany who would have been happy to see the end of denazification. A *New York Times* article from September 1945, only five months after Germany's capitulation, gives an example of a prominent US voice speaking against denazification: General George S. Patton. Author Raymond Daniel paraphrased Patton, writing "he made three main points. . . that, in general, far too much fuss has been made regarding denazification in Germany, that vast numbers of party members had been dragooned into joining, and that the best hope for the future was in 'showing the German people what fine fellows we are.' . . . He made it clear that it was more important to get the German economic machine running than to purge the industry of Nazi bosses."⁷³ Patton was serving as military governor of Bavaria, so his views could not have been without a degree of popularity or influence—as shown by Landrum Bolling, who in the article previously discussed, wrote "a lot of Army brass agreed completely with

the incautious general.”⁷⁴ Patton also is quoted: “The Nazi thing is just like a Democrat and Republican election fight.”⁷⁵ Such dismissal of the importance of the Nazi threat reveals either friendliness or indifference to fascism that most of Patton’s peers would probably sooner speak behind closed doors than to the public. His concern for the economy over the goal of justice is in line with the views of other wealthy and powerful US citizens.

Raymond Daniel reported further: “When it was pointed out to [Patton] that . . . reactionary Nationalists and Nazis still dominated the life of Bavaria, he retorted angrily: ‘Reactionaries! Do you want a lot of Communists?’”⁷⁶ This quote gets to the core of the opposition to denazification. Fascism and communism are diametric antagonists. In the cynical world of realpolitik in which right-wing figures tend to live (a cynicism also exhibited in the earlier *Barron’s* article), to oppose one is to serve the other. Denazification is clearly against fascism; therefore denazification is in service to communism. It is doubtless many on Patton’s side agree that the logical conclusion of principled objection to denazification is support of fascism, yet many people had the tact to not make the connection so blatant.

In “Bitterness and Danger Are Legacies Of Bungled Denazification Program,” Landrum Bolling relayed the dissatisfaction of American denazification officials with the result of their own program, but he included in his findings of these workers’ opinions a crucial exception:

Many Military Government officials, particularly those connected with the problems of Germany’s economic revival, are openly hostile to denazification—on the grounds of expediency. They don’t believe Germany can be properly run without the assistance of the experts and technicians who “happened to get mixed up with the Nazis. ”“This is, of course, pure nonsense,” a denazification official for Hesse told me. “You can’t tell me that the discredited 15 per cent of the German population who were Nazis are irreplaceable and essential as the group from which to pick the administrators of postwar Germany. If we exercised sufficient control over the doings of these German

Spruchkammern (denazification tribunals), we could see to it that the non-Nazis get the breaks and that the old party boys get what they deserve.”⁷⁷

This quote is further evidence that economic concerns were the primary reason given by opponents of denazification, and Bolling also provides a direct refutation of this reasoning. The official for Hesse gave the opinion of most US observers, that denazification should have been successful if only the leadership had stuck to its original goals without caving to pressures to expedite denazification and deprioritize the pursuit of justice.

Were these pressures legitimate, or were they used as convenient excuses to take an approach that was softer on fascism and more in line with the interests of the American business elite (the interests represented by the *Barron's* article and the interests that had solidarity with Hugo Stinnes)? After World War II, the Cold War quickly claimed the greater part of the United States' geopolitical attention. The US sought to use West Germany as a bulwark against the Warsaw Pact as the front line of the Cold War. To be a reliable bulwark against threats of invasion and infiltration, the US needed West Germany to be stable, rebuilt, and unified. US leaders must have believed denazification impeded these objectives by taking US and German attention and resources, by pitting Germans against each other, and by disallowing Nazis from working in the military, government, and industry, where they could serve to make West Germany into the bulwark the US needed it to be. Thus, denazification had to be wrapped up, and the US desire for justice ignored.

Conclusion

US citizens in the latter half of the 1940's held a variety of convictions on the denazification program their country was administering in West Germany. For some people, support of the principle of denazification led to dissatisfaction with the limited result of the program in Germany, while others thought denazification was already going too far. Most commentaries analyzed from this time supported denazification, including those of Jewish writers and journalists who were in Germany covering the process. People in opposition included right-wing figures in US leadership and media, who downplayed pervasive Nazi influence in Germany and the importance of justice for the victims of Nazism,

prioritizing instead economic rebuilding. Of these two opposing viewpoints, it is clear to see which one the US authorities chose to heed as they delegated the task of denazification to Germans who had no desire to see themselves punished for Nazi crimes and connections.

The economic rebuilding argument was refuted at the time by the denazification official from Hesse who told Landrum Bolling in 1948 that it cannot be that the “15 percent”⁷⁸ of the German population who were Nazis were so essential to the functioning of German society that they had to be the ones given the powerful positions in the administration of West Germany. He knew that the supposed irreplaceability of the Nazis was “nonsense”⁷⁹ used by the US authorities to justify their decision to abandon the principles they had espoused at Yalta and Potsdam. He knew that the goal of true denazification, of the “party boys getting what they deserve,”⁸⁰ was within reach; the main problem was the lack of a commitment to justice and antifascist principles on the part of the occupiers of Germany.

Beyond the failure to achieve justice for the Nazis' millions of victims, the lack of denazification after World War II has consequences that reach the twenty-first century. Western institutions such as NATO and the EU, more relevant and powerful now than they ever were, are poisoned with Nazi influence. The Federal Republic of Germany, the government of West Germany that absorbed East Germany to become today's Germany, was staffed by Nazis in positions high and low only a few generations ago, particularly in the Bundeswehr. Further study is called for to determine the expression and effect of lingering Nazi influence in these bodies, and even US institutions such as the CIA, but what is certain is that this influence could have been purged, but was not. Despite the popularity and possibility of denazification, US authorities deferred instead to parts of US society that contended economic and anticommunist interests justified the rehabilitation of Nazis and the forgoing of justice.

¹ Association for Diplomatic Studies and Training, “The Long Arm of History – Kurt Waldheim Banned for his Nazi Past,” *ADST.org*, June 8, 2015. <https://adst.org/2015/06/the-long-arm-of-history-kurt-waldheim-banned-for-his-nazi-past/>.

² The National Jewish Post and Opinion, "Minister Criticizes U.S. Attitude on Gen. Heusinger, Nazi Brute," *The National Jewish Post and Opinion*, January 19, 1962.

³ Jürgen Elvert, "Walter Hallstein, Biography of European." *Luxembourg Centre for Contemporary and Digital History*, June 7, 2016. https://www.cvce.eu/obj/jurgen_elvert_walter_hallstein_biography_of_a_european_1901_1982-en-a1adea08-b8ee-4e00-87c8-2fe9bc18c176.html.

⁴ Martin A. Lee, "The CIA's Worst-Kept Secret: Newly Declassified Files Confirm United States Collaboration with Nazis," *Institute for Policy Studies*, May 1, 2001. https://ips-dc.org/the_cias_worst-kept_secret_newly_declassified_files_confirm_united_states_collaboration_with_nazis/.

⁵ Bianka Janssen, *From Crusade to Hazard*, (Lanham: Scarecrow Press, 2009), 217.

⁶ Janssen, *From Crusade to Hazard*, 24.

⁷ Anton Kaes, "What to Do with Germany? American Debates about the Future of Germany, 1942-1947," *German Politics and Society*, 13 (1995), 139.

⁸ Frederick Taylor, *Exorcising Hitler*, (London: Bloomsbury Press, 2011).

⁹ Tom Bower, *The Pledge Betrayed, America and Britain and the Denazification of Postwar Germany*, (Garden City: Doubleday, 1982), 14.

¹⁰ Perry Biddiscombe, *The Denazification of Germany: A History 1945-1950*, (Gloucestershire: Tempus Publishing, 2007).

¹¹ Antonio S. Thompson, *Men in German Uniform: POWs in America During World War II*, (Knoxville: University of Tennessee Press, 2010).

¹² Taylor, *Exorcising Hitler*.

¹³ Kaes, "What to do with Germany? American Debates about the Future of Germany, 1942-1947."

¹⁴ Janssen, *From Crusade to Hazard*.

¹⁵ Luke Fenwick, "The Protestant Churches in Saxony-Anhalt in the Shadow of the German Christian Movement and National Socialism, 1945-1949," *Church History* 82, no. 4 (2013).

¹⁶ Earl F. Ziemke, *The U.S. Army in the Occupation of Germany 1944-1946*, (Washington D.C.: Center of Military History, 1990).

¹⁷ Thomas Boghardt, "The Long Shadow of the Third Reich," in *Covert Legions*, (Washington D.C.: Center of Military History, 2022).

¹⁸ The Southern Jewish Weekly, "Denazification Farce," *The Southern Jewish Weekly*, September 8, 1950.

¹⁹ The Southern Jewish Weekly, "Denazification Farce."

²⁰ The Southern Jewish Weekly, "Denazification Farce."

²¹ The Southern Jewish Weekly, "Denazification Farce."

²² The Southern Jewish Weekly, "Denazification Farce."

²³ Gerhard Jacoby, "End of Denazification," *The Wisconsin Jewish Chronicle*, July 8, 1949.

²⁴ Jacoby, "End of Denazification."

²⁵ Jacoby, "End of Denazification."

²⁶ Jacoby, "End of Denazification."

²⁷ Jacoby, "End of Denazification."

²⁸ Jacoby, "End of Denazification."

²⁹ Jacoby, "End of Denazification."

³⁰ According to Jacoby, .1% of Nazis taken to trial were "major offenders", 2.2% "offenders", 11.1% "lesser offenders", 51.3% "followers", and 33.5% amnestied without categorization.

³¹ Jacoby, "End of Denazification."

³² Jacoby, "End of Denazification."

³³ Jacoby, "End of Denazification."

³⁴ Acronym for Schutzstaffel, meaning "Protection Squadron," paramilitary organization loyal to Hitler and the Nazi party.

³⁵ Abbreviation for Geheime Staatspolizei, meaning "Secret State Police," official secret police of the Third Reich.

³⁶ Jacoby, "End of Denazification."

³⁷ Jacoby, "End of Denazification."

³⁸ Jacoby, "End of Denazification."

³⁹ Jacoby, "End of Denazification."

⁴⁰ Jacoby, "End of Denazification."

⁴¹ Robert F. Worth, "Ernest S. Leiser, 81, Producer; Helped CBS News Move to TV," *The New York Times*, December 2, 2002.

⁴² Ernest Leiser, "New Hitler-Like Politics in Germany", *The Santa Rosa Republican*, March 10, 1949.

⁴³ According to Gerhard Jacoby's *End of Denazification*, the vast majority of fines were for less than 1000 Reichsmarks, which equaled \$100 U.S. dollars in 1945, or around \$1500 in 2023.

⁴⁴ Leiser, "New Hitler-Like Politics in Germany."

⁴⁵ Leiser, "New Hitler-Like Politics in Germany."

⁴⁶ Leiser, "New Hitler-Like Politics in Germany."

⁴⁷ Leiser, "New Hitler-Like Politics in Germany."

⁴⁸ Leiser, "New Hitler-Like Politics in Germany."

⁴⁹ Ernest Leiser, "U.S. Denazification Program a Failure", *The Santa Rosa Republican*, March 8, 1949.

⁵⁰ Leiser, "U.S. Denazification Program a Failure."

⁵¹ Leiser, "U.S. Denazification Program a Failure."

⁵² Leiser, "U.S. Denazification Program a Failure."

⁵³ Leiser, "U.S. Denazification Program a Failure."

⁵⁴ Leiser, "U.S. Denazification Program a Failure."

⁵⁵ Leiser, "U.S. Denazification Program a Failure."

⁵⁶ Leiser, "U.S. Denazification Program a Failure."

⁵⁷ Adolf Heusinger.

⁵⁸ Emil Augsburg.

⁵⁹ Wernher von Braun.

⁶⁰ Hans Speidel.

⁶¹ U.S. Institute of Peace, "In Memoriam: Landrum Bolling," *U.S. Institute of Peace*, January 19, 2018. <https://www.usip.org/press/2018/01/memoriam-landrum-bolling>.

⁶² Landrum Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program," *The Gazette and Daily*, February 26, 1948.

⁶³ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

⁶⁴ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

⁶⁵ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

⁶⁶ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

⁶⁷ Associated Press, "Allies Order German to Break Up Empire," *Washington Evening Star*, November 15, 1951.

⁶⁸ Associated Press, "Allies Order German to Break Up Empire."

⁶⁹ Associated Press, "Allies Order German to Break Up Empire."

⁷⁰ Barron's National Business and Financial Weekly, "Denazification," *Barron's National Business and Financial weekly*, February 3, 1947.

⁷¹ Barron's National Business and Financial Weekly, "Denazification."

⁷² Kenneth Pringle, "100 Years of Barron's," Barron's, 2021.

<https://www.barrons.com/100-years-of-barrons/about>.

⁷³ Raymond Daniel, "Patton Belittles Denazification; Holds Rebuilding More Important," *The New York Times*, September 23, 1945, 26.

⁷⁴ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

⁷⁵ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

⁷⁶ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

⁷⁷ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

⁷⁸ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

⁷⁹ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

⁸⁰ Bolling, "Bitterness And Danger Are Legacies Of Bungled Denazification Program."

Bibliography

Primary Sources

- Associated Press. "Allies Order German to Break up Empire." *Washington Evening Star*, November 15, 1951.
- Barron's National Business and Financial Weekly. "Denazification." *Barron's National Business and Financial Weekly*, February 3, 1947.
- Bolling, Landrum, "Bitterness And Danger Are Legacies Of Bungled Denazification Program," *The Gazette and Daily*, February 26, 1948.
- Daniel, Raymond. "Patton Belittles Denazification; Holds Rebuilding More Important." *The New York Times*, September 23, 1945.
- Jacoby, Gerhard. "End of Denazification." *The Wisconsin Jewish Chronicle*, July 8, 1949.
- Leiser, Ernest. "U.S. Denazification Program a Failure." *The Santa Rosa Republican*, March 8, 1949.
- Leiser, Ernest. "New Hitler-like Politics in Germany." *The Santa Rosa Republican*, March 10, 1949.
- The Southern Jewish Weekly. "Denazification Farce." *The Southern Jewish Weekly*. September 8, 1950.

Secondary Sources

- Association for Diplomatic Studies and Training. "The Long Arm of History – Kurt Waldheim Banned for his Nazi Past." *ADST.org*, June 8, 2015. <https://adst.org/2015/06/the-long-arm-of-history-kurt-waldheim-banned-for-his-nazi-past/>.
- Biddiscombe, Perry. *The Denazification of Germany: A History 1945-1950*. Gloucestershire: Tempus Publishing, 2007.
- Boghardt, Thomas. "The Long Shadow of the Third Reich," in *Covert Legions*. Washington D.C.: Center of Military History, 2022.
- Bower, Tom. *The Pledge Betrayed, America and Britain and the Denazification of Postwar Germany*. Doubleday, 1982.
- Elvert, Jürgen. "Walter Hallstein, Biography of European." *Luxembourg Centre for Contemporary and Digital History*, June 7, 2016. https://www.cvce.eu/obj/jurgen_elvert_walter_hallstein_biograp

hy of a european 1901 1982-en-a1adea08-b8ee-4e00-87c8-2fe9bc18c176.html.

- Fenwick, Luke. "The Protestant Churches in Saxony-Anhalt in the Shadow of the German Christian Movement and National Socialism, 1945–1949." *Church History* 82, no. 4 (2013).
- Janssen, Bianka. *From Crusade to Hazard: the Denazification of Bremen, Germany*. Scarecrow Press, 2009.
- Kaes, Anton. "What to Do with Germany? American Debates about the Future of Germany 1942–1947." *German Politics & Society* 13, no. 3 (36) (1995): 130–41.
- Lee, Martin A. "The CIA's Worst-Kept Secret: Newly Declassified Files Confirm United States Collaboration with Nazis." *Institute for Policy Studies*, May 1, 2001. https://ips-dc.org/the_cias_worst-kept_secret_newly_declassified_files_confirm_united_states_collaboration_with_nazis/.
- Pringle, Kenneth. "100 Years of Barron's." *Barron's*, 2021. <https://www.barrons.com/100-years-of-barrons/about>.
- Taylor, Frederick. *Exorcising Hitler*. Bloomsbury Press, 2011.
- The National Jewish Post and Opinion. "Minister Criticizes U.S. Attitude on Gen. Heusinger, Nazi Brute." *The National Jewish Post and Opinion*, January 19, 1962.
- Thompson, Antonio S. *Men in German Uniform: POWs in America during World War II*. University of Tennessee Press, 2010.
- U.S. Institute of Peace, "In Memoriam: Landrum Bolling," *U.S. Institute of Peace*, January 19, 2018. <https://www.usip.org/press/2018/01/memoriam-landrum-bolling>
- Worth, Robert F. "Ernest S. Leiser, 81, Producer; Helped CBS News Move to TV," *The New York Times*, December 2, 2002.
- Ziemke, Earl F. *The U.S. Army in the Occupation of Germany 1944–1946*. Center of Military History, 1990.

Queens of Punk Rock: The Impact of The Slits, Dolores O'Riordan, and Kirsty MacColl on the Subgenre

Lauren Textor

Flashing metal studs. The smell of leather. Sweaty, moshing bodies covered in tattoos. Punk is the black sheep of the rock and roll family. Its role in musical history is as important as that of any other subgenre/subculture, but punk's deliberate (and sometimes extreme) rejection of traditional middle-class values is provocative and often uncomfortable. Although female musicians propelled the initial punk movement, academics often overlook or even actively disregard the contributions of bands that are not composed of white males. Unfortunately, scholarly sexism takes its cue from punk's exclusionary fans and producers. Why is the subgenre so often narrowly defined by academics and with such little regard for the contributions of women?

Music journalist Simon Reynolds posits 1976-1977 as the initial punk movement and the period from 1978-1984 as post-punk (Murphy, 2014, p. 51). This narrow linear frame is based on the formation of the Sex Pistols and the Clash. While prominent, these two bands should not define an entire subgenre. Other groups with female and racially diverse members participated in the same tradition, though they did not share the spotlight nor benefit from white maleness. This essay focuses on female punk and post-punk artists from the United Kingdom and Ireland. However, it is important to note that Black bands such as Pure Hell, Fishbone, and the X-Ray Spexs were creating punk music during the same time as the Sex Pistols and the Clash (but without the same amount of recognition). Although these bands are outside the scope of this essay as they contain male-identifying members, more research into their impact is necessary. Even today, there is a pervasive attitude of "punk purism" in academia. This gatekeeping mentality serves to shut out diverse acts from the musical canon.

Much of the academic discourse about punk has been based on male bands or artists, as scholars often neglect to recognize female-led bands and artists as part of the subgenre and include them in articles on the topic. Although an artist or a band may have punk in their repertoire, if

they overlap with other genres—such as folk or pop—they are generally excluded from the label “punk” (especially if they are women). Overall, rock was (and still is) primarily dominated by masculine connotations and imagery. Matthew Gelbart suggests that readers consider punk “an attitude and mode of behaving, incorporating a snarling, anti-establishment stance, torn and safety-pinned clothing, certain dances (the pogo), violent behavior at gigs, and so forth” (Gelbart, 2011, p. 233). While punk enthusiasts generally accept this definition, it’s necessary to reconsider the masculine framing of the subgenre/subculture. This essay will first redefine punk from a feminine perspective, then locate several examples of female artists often excluded from the subgenre, including The Slits, The Cranberries’ Dolores O’Riordan, and “Fairytale of New York” singer Kirsty MacColl.

I will be using a variety of sources, including newspaper, magazine, and journal articles. News articles are the best primary sources to illustrate public opinion of the selected female punk artists during the peak of their careers. The journal articles take a more academic approach by analyzing the enduring impact of each artist. For example, I have included O’Riordan’s 1994 cover issue of *Vox*, Helen Reddington’s academic essay on British punk entitled “Space to Play,” and the *Irish Times*’s backstory on “Fairytale of New York.” The selection of sources is meant to provide a well-rounded view of each artist and their contributions. Additionally, I have included some relevant information about MacColl’s ties to the pop genre, as it does not necessarily exclude her from the simultaneous label of “punk” or “post-punk.”

Punk Rock and Femininity

Before redefining punk rock from a female perspective, it is necessary to dissect its current definition. Firstly, the time frame Reynolds proposes for the movement is too restrictive. The Ramones were founded in 1974, and Death was formed even earlier in 1971. These two American bands contribute to the argument for expanding the punk timeline. Gelbart writes, “... those initially inclined to see punk only as a short, volatile series of events in the late seventies were soon confronted by the fact that the word ‘punk’ did not die out suddenly. Instead, critics, fans, and groups have applied it hundreds of thousands of times since the end of the 1970s” (Gelbart, 2011, p.233). At the most basic level, punk is loud and aggressive

music with nonconformist themes. By keeping the label broad, we keep it inclusive, which supports the subgenre's radical values. Punk is about volume, simplicity in chords and content, and anti-establishment values—not about barring anyone from participation (with the notable exception of snobbish posers).

Hardcore punk enthusiasts may insist upon strict adherence to additional imagined guidelines, but this adherence goes against what punk stands for. Female artists in the 1970s and 80s faced massive difficulties in establishing themselves in the music industry in general—but specifically within the rock genre. Their public personas, clothing, and behaviors presented more barriers for them than their male counterparts. Therefore, when studying the subgenre, we must look at punk's general criteria through a feminine lens.

Helen Reddington's article "Space to Play" describes how British female punk bands set themselves apart from male rock bands that adhered to repetition in music and costuming. She writes, "The women punk bands at this time subverted these tropes, carving out their own niche by taking a different approach to both listening and playing, while appropriating the instrumentation used by their male contemporaries" (Reddington, 2021, p.237). Guitars, bass, drums, and vocals continued to dominate the stage, even as the women experimented with their sound.

Booking, publicity, and performances all had gendered consequences as the music industry set clear, sexualized roles for women. The "look" of a group was tailored to the male gaze. Female band members were meant to be feminine, sexy, unattainable, fantasy-inspiring, approachable, and mysterious all at once. Reddington writes, "The music industry presented a 'rule book' of gender behaviour in every aspect of its practice: visually, record sleeves that featured progressively undressed female models such as *Roxy Music's Studio Album* (1972), *Stranded* (1973) and *Country Life* (1974) had made it very clear to young women what their role should be in relation to rebellious young men, very much in line with advertising in general at the time" (Reddington, 2021, p.243). Not only were female bandmates living with the realities of sexism, but they also saw those harsh realities reflected at them with every turn of a magazine page.

Punk was not always as welcoming to women as its subversive sound seemed to promise. Still, the proclaimed values of the subgenre as

pro-chaos and anti-professional created an unprecedented opening for new female-led acts, even those without prior experience, to step onto the stage. Suddenly, record deals and formal music education were spurned as unnecessary. Creating and marketing music became more accessible than ever to the everyday woman—but it would take sacrifices and the right “look” for a band to outlast its first few performances.

The Slits

The all-female British punk group, The Slits, was formed in 1976. According to Reynolds, this should make them part of the original punk movement. Despite the band’s impeccable timing, they were not welcomed with open arms at any point. Molloy College communications professor and musician Brian Cogan describes the Slits as “an anomaly even in a movement by and for outsiders” (Cogan, 2012, p.123). Male bands, managers, producers, and punk fans were threatened by the band’s unorthodox ownership of female sexuality. Cogan quotes an interview with guitarist Viv Albertine about the girls’ sense of freedom and power in dressing in bondage gear, Doc Martens, and ratty hair (Cogan, 2012, p.126). Although punk clothing was typically provocative and unkempt, the girls were faced with extra doses of unnerved public reactions. Middle-aged men, in particular, were unsure how to react to their overt eroticism, especially given the girls’ youth. Based on the lack of published literature about female punk artists, it appears that academics are similarly unable to navigate the intersection of sexuality and music.

The band’s controversial decisions extended further than its members’ outfit choices. The Slits maintained independence at the cost of commercial success and allegiance. As Cogan observes, they were frustrated by the similarities between punk and rock and roll (Cogan, 2012, p.128). Like many other bands at that time, they faced the challenge of distinguishing themselves and finding their audience without selling out. To create a purer sound, they fused punk with reggae and dub (Cogan, 2012, p.128). Their affinity for Jamaican music set them apart from mainstream bands.

Despite negative consequences, this display of insistence on autonomy and experimentation is one reason why The Slits aren’t as popular, as well-known, or as enduring as their contemporaries. It is also why they are deserving of legitimate recognition and academic study. Their

contribution to the punk movement was bright and brief, leaving behind more history than music. Cogan writes, "The Slits by using no distinct manifesto, except for an exploration of gender and sexuality in a free form and open system that allowed multiple interpretations, recreated punk rock as uniquely their own, and in doing so, created a free space that would be used by all female punks in the future" (Cogan, 2012, p.134). Messy, controversial, and fated for destruction, the Slits most traditionally represent the supernova of punk of the three examples in this paper.

Kirsty MacColl

Kirsty MacColl is not often associated with punk, despite beginning her career at 18 as a backing singer on *The Drug Addix Make a Record* (Radiobox.co.uk, 2015–2022). There's little information available about the extended play, which contains only four songs, on which MacColl is barely audible. While her stint with the band was fleeting, it prompts the question: Are you once a punk, always a punk? Based on MacColl's personal life and musical evolution, the answer is a resounding "yes."

MacColl is best remembered for her vocal feature on the Pogues' "Fairytale of New York." Does her collaboration with the Anglo-Irish punk band make her a part of the genre, too? The song hit the top spot on the Irish charts upon release and then spent an additional 109 weeks on the charts for 17 years (Lynskey, 7 Dec. 2020). While MacColl didn't write the song, her energetic and sarcastic voice gives it an edge. In the last verse, the Pogues' front man, Shane MacGowen, sings, "I could have been someone," and MacColl responds, "Well, so could anyone!" (Pogues, 1987). Together, the duo formulates a charismatic amount of believable longing and bickering. MacColl's contributions to the punk movement may be few, but her impact is not to be underestimated.

MacColl's career as a pop singer was set apart by her attitude in addition to her vocals. In "Prospects and Retrospects: A Flame Immune to the Wind," Les Back writes, "Part of Kirsty MacColl's public appeal was her sassy and defiant attitude towards the music industry" (Back, 2003, p. 108). MacColl was not simply grateful to be included; in the spirit of punk, she made her own rules. She took her time between releases, experimenting with her sound as in the well-reviewed *Tropical Brainstorm*. Just as The Slits drew from reggae, MacColl drew from Cuban influences—but instead of appropriating an existing style of music, she made something utterly

her own. Not all—or even most— of MacColl’s work is strictly punk, but the thread of punk is present throughout all her work.

Back writes, “In the media world of bloated male ego’s [sic] Kirsty’s music—in which men are so often cut down to size— clearly spoke volumes” (Back, 2003: 107). MacColl and MacGowen’s back-and-forth bickering in “Fairytale of New York” is only one example of how MacColl pushes back against the male figures in her lyrical narratives. In “A New England,” she sings, “I loved the words you wrote to me / But that was bloody yesterday / I can’t survive on what you send / Every time you need a friend” (MacColl, 1985). MacColl’s music establishes her as a lover but also as an independent woman who stands on her own two feet. She is unwilling to be swept away by romantic notions or empty promises. The sound and arrangement of “A New England” is not punk. It has little in common with Kirsty’s early work on *The Drug Addix Make a Record*. Still, it is her cutting words, tone, and disbelief in established institutions that maintain her ties to the subgenre.

In an *Entertainment Weekly* article, Greg Sandow describes MacColl’s voice alternately tart, spitting, and tender (Sandow, 11 May 1990, p. 58). Sandow writes, “It’s hard to imagine how anyone so joyfully sharp-tongued could have worked so long in the shadows, singing background harmony for the likes of Morrissey, former lead singer of the Smiths, and the Rolling Stones” (Sandow, 11 May 1990–p. 58). MacColl deserves her place in the punk canon, especially as there are so few female artists recognized. To gatekeep the singer because of her more prominent pop career is to ignore her contributions to the scene. MacColl’s transition out of punk was a natural one, but that doesn’t mean that her beginnings should be erased.

Dolores O’Riordan

As the leading lady of The Cranberries, Dolores O’Riordan became one of the world’s most prominent and visible Irish people. Her music and lyrics benefit from punk influences, but she also grew as an individual from the adoption of a countercultural attitude. In a *World Press Review* article entitled “Cranberry Sauce,” journalist Gail Robinson writes that O’Riordan was initially so shy in front of crowds that she performed with her back to the audience (Robinson, Oct. 1995p. 43). This is a far cry from O’Riordan’s attitude only a few years later when she wore a white bra

and underwear underneath a sheer dress to her wedding ceremony. The singer went from making herself as small as possible to placing herself in the spotlight with a pixie cut and low-cut tops. Like The Slits, O'Riordan took control of her own sexuality and used it to elevate the stardom of the Cranberries. She famously bleached her hair, clipped it short, and wore heavy eye makeup.

The post-punk aspect of O'Riordan comes into play with the simultaneous tenderness and edge that her lyrics possess. She is angry, angry, loving, and accusatory all at once. It's impossible to mention O'Riordan's impact without including commentary on "Zombie," her response to the IRA bombings in Warrington, England. She made the cover in a 1994 edition of *Vox*, which describes the song as "a seething condemnation of the IRA with Dolores bringing forth a fearsomely angry vocal from a previously untapped reservoir of bile" (Mueller, Nov. 1994p. 70). The simple, catchy, yet biting chorus is typical of punk. The message behind the lyrics is complicated and historically rich, and the repeating refrain of "zombie" intensifies the mood. O'Riordan's wailing takes after the Irish tradition of funeral keening, but it also has a decided rock tone.

The Cranberries became one of the world's most popular and well-known bands thanks to O'Riordan. She honored her Irish roots without changing to fit in with other mainstream artists from the United Kingdom. O'Riordan used her platform to bring attention to social issues in a way that causes Mueller to describe her as a "compulsive carer, a haemorrhaging [sic] heart, someone incapable of viewing the world's ills with a kind of detachment" (Mueller, Nov. 1994p. 70). This represents her refusal to conform and her stubborn desire to stay true to a political message. Her commitment to compassion despite the extreme, violent historical circumstances surrounding her is more than admirable—it is absolutely punk.

Conclusion

There has been an ongoing attempt by academics and (usually male) fans to confine the term "punk" to a box. The defined period for punk is narrow, using the Sex Pistols as its North Star. Before the band's formation in 1975, other groups were performing similarly loud, aggressive, and anti-establishment music without the same standard of acknowledgment. In highlighting two individual female artists and one girl

band from the same period, I have attempted to show that the “punk purist” attitudes are unfounded and unnecessarily exclusionary. When people, academic or otherwise, neglect to recognize the works of female (and non-white) bands, they are contributing to the erasure of music history. Punk artists should be allowed and even encouraged to overlap with other genres without fear of backlash. Fusion and musical experimentation do not detract from a genre but make it richer. Punk’s feminine and masculine sides should be embraced in equal measure. This essay has attempted to redefine punk from a feminine perspective and to locate the musical acts of The Slits, Dolores O’Riordan, and Kirsty MacColl within the subgenre. Each of these acts, while not strictly and traditionally punk, fit with the more basic proponents of punk music.

Works Cited

- Back, L. (2003) 'Prospects and Retrospects: A Flame Immune to the Wind,' *City*, Vol. 7, No. 1, 107-111.
- Cogan, B. (2012) 'Typical Girls?: Fuck Off, You Wanker! Re-Evaluating the Slits and Gender Relations in Early British Punk and Post-Punk,' *Women's Studies*, Vol. 41: 121-135.
- Gelbart, M. (2011) 'A Cohesive Shambles: The Clash's "London Calling" and the Normalization of Punk,' *Music & Letters*, Vol. 92, No. 2: 230-272.
- Kirsty MacColl— Radio X (2015-2022). Available at <https://www.radiox.co.uk/features/kirsty-maccoll-things-you-may-not-know/> (Accessed 15 Dec. 2022).
- Lynskey, D. (2020) 'Fairytale of New York: The surprising story behind The Pogues' Christmas anthem,' *Irish Times*, 7 Dec.
- MacColl, K. (1985) 'A New England,' *Hits 2: The Tape*. Available at: Spotify. (Accessed 09 Dec. 2022)
- Mueller, A. (1994) 'Eire and Graces,' *Vox*, Nov., 69-110.
- Murphy, M. (2014) 'Punk and Post-Punk in the Republic of Ireland: Networks, migration, and the social history of the Irish music Industry,' *Intellect Limited*, Vol. 3, No. 1: 49-66.
- Pogues. (1987) 'Fairytale of New York,' *If I Should Fall from Grace with God*. Available at: Spotify (Accessed 09 Dec. 2022)
- Reddington, H. (2021) 'Space to play: the sound of British female punk music and its engagement with reggae in the 1970s,' *Popular Music History*, Vol. 13, No. 3: 235-253.
- Robinson, G. (1995) 'Cranberry Sauce,' *World Press Review*, Oct., p. 43.
- Sandow, G. (1990) 'Kite,' *Entertainment Weekly*, 11 May, p. 58.

Author Biographies

Catherine Abbott (she/her) is a senior majoring in political science with a minor in philosophy. She wrote "The Problem with International Social Contracts" for Dr. Bruce Bubacz's History of Modern Philosophy course, and thanks him for invaluable guidance and support throughout the research process. His passion for philosophy and dedication to his students truly made the learning experience memorable and inspiring. She also thanks Dr. Debra Leiter, Dr. Rebecca Best, and Dr. Ben Woodson of the UMKC Department of Political Science and Philosophy for shaping her academic journey, inspiring her to explore research methodologies, and offering crucial guidance. Catherine presented her research on conflict recidivism between Kyrgyzstan and Tajikistan at the International Studies Association Midwest Region Conference in November in St. Louis. After graduation, she plans to attend graduate school and focus on security studies and international relations.

Ashlesha Bhojane (she/her) is a second-year student in the UMKC six-year medical program. She wrote "As Seen on TV: The Effects of Pharmaceutical Advertising on the Doctor-Patient Relationship" for English 225, taught by Professor Cameron Summers. She thanks Professor Summers, her family, and her peers for their support of her research endeavors. Upon graduation from medical school, Ashlesha plans to pursue a surgical career and conduct scholarly research on surgical efficiency and education as well as quality improvement of patient care.

Nico Bradshaw (she/her) is a third-year student double-majoring in biology and English. She wrote "Kansas City, Missouri, Climate Change Indications: An Analysis of Climate Data Between 1973 and 2023" for Honors English 225, instructed by Professor Bruce Barrett. She would like to thank the National Centers for Environmental Information for providing access to their archival climate data, as well as Professor Barrett and her classmates for their support. After graduating, Nico plans to pursue a career in marine and aquatic biology and continue to conduct research.

Caitlyn Davis (she/her) is a second-year student earning bachelor's degrees in biology and chemistry at UMKC. She wrote "YouTube's Flat-Earth Discourse Community" for Dr. Henrietta Rix Wood's Honors English 225 course. She would like to thank Dr. Wood and her classmates for their feedback during the writing process. She would also like to thank her parents for their ever-present support. After graduation, she plans to pursue a career in the biological sciences.

Alijah S. Henderson (she/her) is a recent UMKC graduate in the first year of the Master of Public Health emphasis in Veterinary Public Health program at the University of Missouri-Columbia. She wrote "*Fomes fomentarius*: A Sustainable Plastic Alternative?" for Dr. Margaret Kincaid's life science writing intensive course. She would like to thank all the teachers who helped her along her journey through UMKC, especially Dr. Kincaid, Dr. Samuel E. Bouyain, Dr. Lena Hooper-Burkhardt, Dr. Tamas Kapros, and Dr. Zhonghua Peng. Alijah also thanks her friends. After completing her master's degree, she aims to work as an epidemiologist focusing on infectious diseases.

Rye Ledford (she/her) earned a bachelor's degree in mathematics and statistics from UMKC in May 2023. She wrote "The Spanish Inquisition and Its Impact on Mathematics in Spain during the Seventeenth Century: A Translation of Excerpts from J. Zaragoza's *Trigonometría Española*" for Dr. Richard Delaware's History of Mathematics writing intensive course. Dr. Delaware was Rye's professor and mentor for five courses, and she is grateful for his support during her studies. She also thanks Nestor S. Nava-Ocampo for his help in translating the seventeenth-century document and Zack Bright for his editing recommendations. Since June 2023, Rye has worked as a catastrophe analyst for Aon Professional Services.

Maha Mateen (she/her) graduated in May 2023 from UMKC with a bachelor's degree in accounting and a bachelor's degree in business administration with an emphasis in finance. She wrote "Regulation in the Cryptocurrency Industry" as her Senior Honors Thesis for the Honors Program, and Professor Julie Kline at the Bloch School of Business was

her faculty mentor. She would like to thank Professor Kline for her guidance, feedback, and support throughout the research process. Maha now works at a public accounting firm in Kansas City.

Kale Marie Michael (she/her) is a third-year student studying sociology and theatre at UMKC. She wrote "'Barbara's Way or the Highway': An Analysis of Barbara Grier and Her Involvement with *The Ladder*, 1957-1972" for the Critical Thinking in the Arts and Humanities Honors course taught by Dr. Henrietta Rix Wood. As a queer woman, Kale Marie was drawn to the historical sapphic community in Kansas City and noticed much of the literature showcased queer historical actors engaging in similar debates in the LGBTQIA+ community today. As a sociology major, she wanted to examine how sociolinguistic communication theories may provide insight on contemporary and historical communication struggles within the LGBTQIA+ community. She hopes future generations will recognize the structural conditions that contribute to their own community-based conflicts. Kale Marie thanks Stuart Hinds, Curator of Special Collections and Archives at Miller Nichols Library at UMKC, for lending his expertise, and Dr. Wood for encouraging her to submit to *Lucerna*. Upon graduation, Kale Marie hopes to enter a PhD program to conduct social science research informed by restorative social justice concepts.

Emma Nowotny (she/her) graduated with a bachelor's degree in history from UMKC in May 2023. She wrote "Denazification of West Germany, 1945-1950: US Disappointment and Justifications" as her senior thesis in history with the help of her faculty mentor, Dr. Andrew Bergerson. She thanks Dr. Bergerson and her history capstone course instructor, Dr. Diane Mutti-Burke, for their support, advice, and editing. Emma now works at an immigration law firm in Overland Park, Kansas, and plans to attend law school in the future.

Lauren Textor (she/her) graduated with a bachelor's degree in English in May 2023. She wrote "Queens of Punk Rock: The Impact of The Slits,

Dolores O'Riordan, and Kirsty MacColl on the Subgenre" for the Trad and Blues course with Professor Aoife Granville at the University of Cork in Ireland during a study abroad program. Lauren is thankful for the help from her mother, Christine, and her boyfriend, Eoghan, in reviewing each draft before submission. She is also thankful for a wonderful study abroad experience with brilliant professors, generous roommates, and all the magic of the Emerald Isle. In the future, Lauren will continue writing for academic and journalistic venues and working with local literacy initiatives.

2024–2025 Submission Guidelines

General

We accept submissions from currently enrolled UMKC undergraduates.

Your submission must have been completed during your undergraduate career at UMKC. You may submit one essay per year.

Previously published or simultaneously submitted work will not be considered for publication in *Lucerna*. For more information, contact Editor-in-Chief Theo Raitzer at umkclucerna@umkc.edu.

Formatting

Articles should be between 2,000–6,000 words, MLA or APA style, 12-point font, double-spaced, and include a works cited or reference page.

Include cover page with your name and phone number, as well as your instructor/PI/faculty mentor's name and email address.

Submissions should be sent as Word documents to umkclucerna@umkc.edu.

PDFs are acceptable if needed to maintain text formatting.

Submission Deadlines

The priority deadline for submission is December 13, 2024.

The final deadline for submission is May 16, 2025.

Selection Process

Each submission to *Lucerna* will be evaluated as an anonymous-review by at least two volunteer Honors Program student reviewers. Submissions are judged for clarity, originality, organization, and argumentative qualities, and a numerical score is assigned to each category. The submissions that receive the highest scores will be considered for publication.

Lucerna is produced by the UMKC Honors Program.