Dear Reader,

We are excited to present the Spring Issue of the *Stanford Undergraduate Research Journal*, Volume 20. In continuing to promote intellectualism and uplift diverse voices, our authors explore themes from disability to machine learning. The Humanities & Social Sciences section examines the history of privatization in DC, Nationalism through interpretations of Machiavelli, anxiety among college students, masculinity in men's prisons, identity work within ethnic *restauration*, Native American maternal health disparities, British evangelical abolitionism, and expansion beyond disability as a sole aspect of reality. The Natural Sciences & Engineering section features articles investigating the use of mycoprotein to supplement nutrition, impacts of data analytics on soccer fan engagement and strategy, skin lesion classification using computational neural networks, and possible applications for machine learning to guide real-time classification of astronomical events.

Since its founding in 2001, SURJ has produced intellectually vibrant collections of outstanding undergraduate research to celebrate students' accomplishments, share their discoveries, and promote an investigative spirit among undergraduates. SURJ's mission is to encourage, recognize, and reward intellectual activity outside the classroom, and we hope that through this publication, we can continue to foster undergraduates' pursuit of creativity and knowledge.

We would like to thank our journal's advisor and professor emeritus of the Stanford Graduate School of Education, Dr. John Willinsky, for his guidance and support. Without him, it would not be possible to keep this journal running. We would also like to thank Mr. Wilson Wang, the Assistant Director of Data Science at the GSE for his help behind the scenes with Open Journal Systems (OJS). Finally, we would like to express gratitude for our Review Board and their dedication to providing detailed feedback on every article.

Congratulations to all of the talented authors who were selected for publication. We were thoroughly impressed and inspired by this work and hope that you will be too!

Sincerely,
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Histories of Privatization: Examining Culture, Legal Conflict, and Economic Transformation at Adams Morgan Plaza in Washington, DC

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Public spaces are disappearing at alarming rates as cities face mounting housing, economic, and social issues. Adams Morgan Plaza in Washington, DC is no different. Over the past several years, the Plaza has experienced numerous changes that have radically altered the neighborhood. It sparked community outrage and an ensuing lawsuit that wound its way, slowly, through the DC courts. This study explores the transformation of Adams Morgan Plaza in Washington, DC, through the lens of legal conflict, economic pressure, and multicultural history. It centers on two research questions: (1) what is the full story of Adams Morgan Plaza before and after its re-acquisition? and (2) what factors shaped its redevelopment? Drawing on historical archives, legal filings, and U.S. Census data, this research employs a mixed-methods approach to trace the Plaza's evolution from a theater site to a contested public space and, most recently, a proposed affordable housing complex. The historical narrative uncovers a pattern of rapid change followed by long stretches of community use, described here as a form of "punctuated equilibrium." The legal analysis chronicles a six-year battle between neighborhood groups and private developers, culminating in the site's transfer to Jubilee Housing in 2023. Economic data from 2012 to 2022 show that Hoffman & Associates' acquisition in 2017 followed declining poverty rates, while Jubilee's involvement aligned with worsening poverty and rising housing needs. Together, these findings suggest that Adams Morgan Plaza's fate was influenced not only by legal ownership and historical claims but also by measurable economic trends in the surrounding neighborhood. The Plaza underscores how public spaces in multicultural cities are shaped by competing visions of community, equity, and development. This study offers a framework for understanding similar conflicts over urban land use in other historically diverse, gentrifying neighborhoods.

Introduction

Adams Morgan Plaza emerged from the liminal background of my running route one rainy Thursday afternoon when I almost crashed into a police officer standing near the bus stop. Before I had a chance to process my close encounter, the crosswalk light had already switched back to red and I was trapped on my side of the street, only one and half miles away from the end of my route. Instead of browsing through my podcast library or even checking my mile splits, I glanced back at the plaza, behind the mysterious chain-link barriers, and took it in for the first time. I saw the way the entire plaza had created an atmosphere, an environment that not only intrigued me but invited me to stay. That would be the case were it not for the fences. In front of one of these tall chain-link barriers on the perimeter of the plaza, the police officer I almost hit was standing, watching a man on a ladder power wash a mural from the plaza's upper wall (Figure 1). Only one day earlier, it read "FREE OUR PLAZA PARA MIGUEL." That was over two years ago.

On that rainy day in 2022, the private development firm Hoffman & Associates closed Adams Morgan Plaza to the public. Its re-acquisition sparked controversy in the community and an ensuing, lengthy legal battle in the DC courts. Neighborhood residents, local DC residents, and other interested parties became increasingly invested in the future of the Plaza because of its history. Adams Morgan Plaza was an important theatre and cultural center of the Adams Morgan Neighborhood before becoming an open-access public square. Its new embroilment against the backdrop of DC's housing landscape was unprecedented and sparked two important questions. What is the full story of Adams Morgan Plaza both before and after its re-acquisition? What factors determined its future? This paper attempts to answer both these questions with two combined methodologies. The first methodology relies on primary and secondary sources—including scholarly articles—to detail the history of Adams Morgan, its surrounding neighborhoods, and Adams Morgan Plaza itself. The second mobilizes census data to understand why the Plaza became

involved in DC's housing economy. In this manner, this paper finds that the Adams Morgan Plaza's transformation into an affordable housing center differs profoundly from its history. The paper points to a possible economic impetus for this historic moment in the Plaza's history observed through worsening poverty rates between 2021 and 2022.

This paper begins with an overview of the methods used in this study, including a personal positionality of the subject matter by the author. Following this, the results are presented in three predominant historical categories: (1) pre-plaza history, (2) legal history, and (3) contemporary economic history. Finally, this manuscript concludes with a summary of the findings and a consideration of future scholarships.

Research Scope and Methodology

To understand the early history of Adams Morgan, this research relied on historical records, photos, and books about the name and establishment of the neighborhood. Some Washingtonian articles were consulted to help detail the neighborhood's early history and the moment when the neighborhood was officially recognized through its name. Following, the work of other scholars was consulted, especially Celestino Zapata and Josh Gibson who wrote a book documenting the evolution of the Adams Morgan neighborhood through photographs. Robert Manning's research was also useful, particularly his discussion of DC's demographic history as a formerly majority-Black city in the 1970s. These scholarly perspectives helped provide a cultural background of the Adams Morgan area for a potential readership unfamiliar with the neighborhood and its connection to DC's broader urban history. A few news articles add to these narratives by discussing the early disasters that plagued the site of Adams Morgan Plaza, including the collapse of the Knickerbocker Theatre in 1922. Building on these foundations, this research traced the Plaza's post-1922 history and its transformation into the Ambassador Theatre, drawing on online archives, podcasts, and primary materials such as original posters. Thus, the Plaza's pre-history is narrated through 1976, before it was officially acquired and turned into a public easement for the neighborhood. Then, the historical scope of this research resumed in 2017 when SunTrust acquired the area of the Plaza and transformed it into a community fixture. The author draws on more contemporary and local news sources to uncover the 21st century history of the Plaza and its early legal history.

The legal history section of this study mostly draws from news sources, websites, and original legal documents from the case as it bounced between the DC Circuit and Superior Courts. News articles and updates about the status of the Plaza since neighborhood residents filed suit against the private development firm Hoffman & Associates who purchased the site proved critical in this next phase of study. These materials help trace the chronology of the lawsuit through news updates, a neighborhood-run website, and original legal filings. As the chronology approaches present-day, the author turns to field work to supplement the other sources used in this study. The closure of the Plaza and its chain link fences posed a challenge when accessing physical parts of the Plaza (Figure 2). Consequently, potential avenues to conduct oral histories at the site of the Plaza were also limited; photographs of documents posted near and around the fences of the Plaza as well as public records help fill potential gaps caused by these physical restrictions.

To propose a potential answer to this question, the economic element of this research pulls from census data and theories of urban geography to understand the economic history of Adams Morgan and its Plaza. The research began by identifying relevant geographic areas using Homer Hoyt's Sector Model of urban geography. Adams Morgan's proximity to the historic Kalorama Triangle neighborhood of DC made Hoyt's Sector Model the most useful geographic framework because it accounts for directional biases in urban land use and value catalyzed by factors like historical zoning (Warf 2010). This allowed the author to select geographies to use for census data analysis that aligned with traditional theories like the Concentric Zone Model while factoring in DC's historic zoning practices. Following this geographic inquiry, data provided on the US Census Bureau website was investigated (US Census Bureau, n.d.-b). Boundaries of the research area were identified using prior geographic analysis such that census tracts that encapsulated the Plaza, the surrounding Adams Morgan neighborhood, and its border community could be selected (Figure 3).

Census data was sourced from the American Community Survey's (ACS) five-year estimates of the poverty rate within the selected census tracts. The five-year estimates provide important data over many years and utilize "estimates based on data collected during the 60 months of the five most recent calendar years." These estimates are drawn from "from all statistical, legal, and administrative entities, including census tracts, block groups, and small incorporated places, such as cities and towns" (US Census Bureau 2022). This allowed a highly detailed investigation of economic trends throughout all the census tracts identified in this study.

The ACS five-year data utilizes a system of ratio estimation that applies two sets of weights: one to each sample person recorded, household person, and group quarters person, and one to each sample housing unit. The ACS's ratio estimation takes advantage of independent population estimates provided by the US Census Bureau to optimize precision and to correct "for under- or over-coverage by geography and demographic detail" (US Census Bureau 2022). In that way, ACS five-year estimates offer the most accurate data for small-population areas such as the census tracts examined in this study. While they are not always the most current because one-year estimates do not survey individual census tracts, they are an accurate data metric to assess in this study, where analyzing separate census tracts is critical (US Census Bureau, n.d.-d).

Two types of data were sourced from the ACS five-year estimates from 2012 to 2022: percent of population for whom poverty status is determined (including those in housing units) and the total number of housing units. Using a percentage rather than a total population living in poverty was chosen to account for varying population sizes between census tracts. On the other hand, the total number of housing units per census tract was selected as a way of measuring the overall fluctuation in housing units within each census tract. Comparing both poverty rates and housing units offers insight into how changes in housing stock may relate to shifting economic conditions. Although both metrics are observed together, this study does not propose that poverty percentages and total housing units are correlated datasets. Rather, these metrics are overlaid to provide a multi-focal image of how economic factors determined the Plaza's future, especially Jubilee Housing's

involvement and their proposals to build low-income housing on the Plaza itself. Both strains of data were compiled by year and analyzed using Microsoft Excel to produce simplified line graphs and data tables for this study.

A History Before the Plaza

The name "Adams Morgan" was originally tossed around during the 1950s and formed by adjoining the names of the all-white John Quincy Adams and now-defunct all-black Thomas P. Morgan Schools. While their partnership in the community was unofficial at first, their cooperation began in earnest after the Supreme Court ruled in favor of integration in 1954 (Leaman 2008). Together with local activists and residents, the schools created the first Adams-Morgan Better Neighborhood Conference to peacefully desegregate the two schools (Figure 4). Although the hyphenated name originally distinguished the neighborhood from others nearby, it eventually fell out of use. Josh Gibson, an expert, and writer about the neighborhood argues that the use of the hyphen is designed to join two "easily identifiable" geographical areas into a single name. Since the two schools did not occupy purely distinct locations, the hyphen disappeared (Leaman 2008; Zapata and Gibson 2006).

Following the establishment of the neighborhood's official title, the development of Adams Morgan began under the careful guidance and encouragement of Mary Foote Anderson. Anderson, the wife of a Missouri Senator, was described as a "dedicated crusader of the early neighborhood." Sixteenth Street saw dramatic growth due to her efforts. Meridian Hill Park—also known as Malcolm X Park—now occupies the land where her home and castle once stood (Zapata and Gibson 2006). Over the years, several proposals to expand the White House and Lincoln Memorial into Adams Morgan were floated, but few materialized. Today, a host of embassies reside on the perimeter of the neighborhood along Sixteenth street. In the 1960s and 1970s, Adams Morgan became a site of much civil unrest like other parts of Washington, DC, and America as a whole. The arrival of the automobile allowed people to move freely in and out of the neighborhood; during this time, dramatic demographic change transformed the neighborhood and indeed, the city at large. The outmigration of residents from the neighborhood made Adams Morgan an increasingly affordable housing locale for many; gradually, more progressive ideas about civil rights and Black Power found substantive footholds in the area (Zapata and Gibson 2006).

During this time, DC's background as a majority-Black city helps to position Adams Morgan in the multicultural historical fabric of the city. In 1970, the city boasted an absolute Black majority of almost 70 percent (Manning 1998). The years prior also saw an increasing amount of Black urban residents moving into the city; in 1970, 27.2 percent of African Americans resided in the suburbs of DC while around 90 percent of white residents were living there by comparison (Manning 1998). This stark contrast in urban versus suburban racial composition is what motivated many to begin calling DC "Chocolate City," an homage to its rich cultural history rooted in Black and African American culture. However, the cultural foundation for this identity began forming well before 1970. Large scale growth of the suburbs coupled with post-World War II decline in city conditions forced an abrupt shift in urban demographics. Racist lending practices, often affording large housing subsidies to white residents moving out of the city and to the suburbs, pushed black residents out of the DC periphery and into its urban core (Summers 2019, 28).

In the years following, the city became disproportionately populated by low-income communities of immigrants and people of color who were forced out of the suburbs due to high costs of living and economic discrimination. These shifts, compounded by historically racist lending practices, fundamentally reshaped the socioeconomic landscape of DC. They left concentrically positioned urban areas of high and low capital, shaped by these types of economic barriers that biased urban land development for decades (Warf 2010). However, civil rights groups fighting against these practices helped bring in an increasingly higher number of immigrants into the city, lured by the early success and optimism of these activists (Manning 1998). But tensions would come to a head during the Civil Rights Movement and the important role DC would play in the staging of political activism and dissent. Though the inflammatory Moynihan Report released in 1965 sparked tension in the city, it was not until Martin Luther King's "I Have A Dream" speech and assassination four days later that transformed the city (Summers 2019, 35–37). The riots in DC during the late 1960s DC prompted large-scale flight of white families and landowners who began moving to the suburbs to avoid the violence (Manning 1998).

As a result, businesses, homes, and other properties in DC's urban core were vacated, allowing a surging immigrant population to begin establishing roots in the city. The new demographic composition of the city was far more diverse as a result: by the 1990s, the city boasted a 72.6 percent minority population; however, there was a large amount of flux in between racial subgroups. Added immigrant communities in the district began to chip away at the majority maintained by Black and African American residents. By 1990, Black and African American urban residents comprised only 65.1 percent of the population compared to their 71.1 percent majority in 1970 (Manning 1998). Overall, this growing economic diversity continued; it sets the stage for the urban world in which Adams Morgan finds itself in contemporary DC.

Adams Morgan Plaza occupies the former site of the Knickerbocker Theatre. On January 28, 1922, the theatre collapsed after a bout of heavy snowfall, injuring a total of 133 people and killing 98 (Gormly 2022). Following the disaster (Figure 5), three days of rescue operations and investigations revealed faulty construction as the cause (Felix, n.d.). In the aftermath, a series of lawsuits and widespread public outcry led to the implementation of several important building codes for Washington, DC (Gormly 2022). Following the collapse of the Knickerbocker Theatre, Thomas Lamb was hired in 1923 to begin construction of the new Ambassador Theatre using the shell of the Knickerbocker as a foundation (Bryan 2012). Several years later, prominent rock performer Jimi Hendrix left tour with The Monkees and performed at the Ambassador for five days starting August 9, 1967 (Fraley 2022; Wolf Trap 2017). The Jimi Hendrix Experience was advertised throughout the neighborhood and drew numerous crowds to the Ambassador (Figure 6) during those five days of summer where anyone—regardless of age—could experience Hendrix's performance (Namdi 2017; Krulik 2017).

The Ambassador eventually closed in January 1968 due to a shortage of funding and a series of unsuccessful musical attractions that failed to generate revenue for the establishment (Schweitzer 2017). The theatre was eventually demolished, and the site was set to

change hands in 1976 when the vacant plot became the prospective site of a new business. During that year, the bank Perpetual Federal Savings and Lending wrote a letter to Adams Morgan Residents proposing to build a branch on the grounds of the former Ambassador Theatre. They also wrote in the letter that they would build a plaza for public use as part of an agreement to dismiss federal complaints against their racist lending practices. Eventually, the land was acquired by SunTrust Bank—now Truist—to build their branch, and the public easement purpose of the Plaza was brought about informally. While Perpetual wrote about its goal to establish a Plaza in Adams Morgan for communal use in their letter, SunTrust articulated no such claims. Nonetheless, before the Plaza's re-acquisition by development firm Hoffman & Associates in 2017, the site was used by the surrounding community for farmers markets, performances, and art festivals (Austermuhle 2017; Maxit 2021).

A Legal History

On June 16th, 2017, the Kalorama Citizens Association (KCA) and the neighborhood group Adams Morgan for Reasonable Development (AM4RD) filed a suit against the private development firm Hoffman & Associates and SunTrust (the Defendants) to regain control of the plaza after it was slated for a new upscale housing project. In his original brief to the DC Superior Court, Paul Zuckerberg—a practicing attorney representing the KCA and AM4RD groups (the Plaintiffs)—noted that the Plaza was under the ownership of the neighborhood, who maintained and used the plaza over many years prior (Schwartzman 2020). Zuckerberg cited a letter that Perpetual Federal Savings and Lending wrote to the Adams Morgan community in 1976 to substantiate his claims (Figure 7). In it, Perpetual Federal Savings President Thomas J. Owen talked about the bank's desire to provide a public space for neighborhood residents:

> "Perpetual agreed to develop the property in such a way as to preserve its open quality, attractiveness and accessibility to the vendors that presently use it. Present calls for a bilingual branch housed in a modest three-story building placed as far back as possible in order to allow ample room for vendors and other open-air activities" (Owen 1976).

Citing *Washington Land v. Potomac Ridge* (2001), Plaintiffs further argued that the Plaza met the necessary criteria to create a public easement: (1) an intent by the grantor to create the easement and (2) acceptance by the public. On June 16, 2017—following his filing with the court—Plaintiffs filed a preliminary injunction against Hoffman & Associates to halt the potential demolition of the Plaza (Zuckerberg, n.d.). One week later, on June 23, Defendants filed documents opposing the preliminary injunction and calling for a summary judgment, arguing that "no genuine issue of material fact exists" and that "Defendants are entitled to judgment as a matter of law" (Jacobs 2017).

On August 4th, DC Superior Court Judge Todd Edelman ruled in favor of the Plaintiffs and granted their request for a preliminary injunction to cease construction at the Plaza. He argued that the burden of proof to establish "no genuine issue of material fact" was on the Defendants, and not sufficiently argued in the Defendant's earlier brief on June 26. Edelman noted that residents of Adams Morgan had a substantial chance of having a substantial

chance of prevailing in their lawsuit. He therefore ordered Hoffman & Associates to halt further construction. The Court further denied the Defendant's request for a summary judgement and instead ordered an expedited hearing for the case (Edelman 2017). On August 8, Edelman delivered another ruling again in favor of the Plaintiffs. He denied the Defendant's earlier claims to require bond or compensation for potential losses incurred by the injunction granted on August 4. Edelman also established mediation sessions and a pretrial conference that would extend the timeline of the trial into 2018. However, Hoffman & Associates would continue to delegitimize the claims of the neighborhood, beginning a 30-month tirade against the Plaintiffs to delay any future trial.

On December 29, 2017, the case was officially transferred to Judge Hiram Puig-Lugo after a series of back-and-forth hearings and filings between the Plaintiffs and Defendants over the previous four months (Superior Court of the District of Columbia 2017). Puig-Lugo handed down a few important decisions, including ordering a mediation session on January 10, 2018 (largely unsuccessful) and granting a summary judgement for the Defendants on March 5, 2018. Puig-Lugo's ruling found that because Hoffman & Associates had no "proprietary interest in the property at issue," the development of the Plaza would be subject to an "executory contract with SunTrust Bank" (Puig-Lugo 2017). Shortly thereafter, the Defendants filed a motion on March 7 to dismiss the case and move further proceedings to the US District Court for the District of Columbia (USDC). Zuckerberg and the original Plaintiffs filed an appeal almost two weeks later, and the case was brought to the District of Columbia Court of Appeals (DCCA) (Superior Court of the District of Columbia 2017).

Although the Plaintiff's appeal called for a jury trial, the case was denied by the DCCA on July 18, 2018. Associate Judges Thomson and Glickman and Senior Judge Steadman wrote that the motion to dismiss the appeal was granted due to "lack of jurisdiction" (Glickman, Thomson, and Steadman 2018). In their opinion, the judges refer to several prior holdings including Reichman v. Franklin Simon Corp. settled by the DCCA in 1978. It found that although the Appellants in the case believed that an earlier summary judgement was issued prematurely, the lack of additional discovery in the case invalidated their claims to an appeal (Yeagley 1978). Thomson, Glickman, and Steadman drew parallels to Zuckerberg's appeal case—supplemented by citations from the District of Columbia code—and affirmed their denial of his appeal. Almost two years later, the case was pushed from the USDC back to the District of Columbia Superior Court on September 25, 2020 (Caesar 2020).

Judge Beryl A. Howell issued a memorandum opinion citing a lack of subject matter jurisdiction and refused to hear the case at all (Howell 2020). Oral arguments were heard again before Judge Puig-Lugo and an oral decision was released on January 12, 2021. Puig-Lugo ruled in favor of the Defendants, denying Plaintiff's motion to stay the proceeding and granting the Defendant's motion for a summary judgement. For three months, both Zuckerberg and Defendants went back and forth about bail payments before Zuckerberg appealed the case once again on March 19, 2021 (Superior Court of the District of Columbia 2017).

Following the reversal, fences went up around the Plaza almost a year later, on March 21, 2022. On a freezing day later that month, unhoused Adams Morgan community member Miguel Gonzales died of hypothermia. Miguel Gonzales grew up in Adams

Morgan and attended Oyster Adams Middle School only a short way away. In 2004, his building was converted into a co-op and while most residents took buyouts and moved, a member of Gonzales' close family stayed. But when she died without a will in 2016, Gonzales was eventually evicted because his name was not on the deed (Moyer 2022). From then on, Adams Morgan remained a central fixture of Gonzales' life, as well as many other unhoused residents struggling to find permanent accommodation. When the plaza was cleared and fences erected, Gonzales' belongings were lost. His death sparked widespread outrage in the Adams Morgan community, much of it directed at Truist, whom many blamed for his wrongful death. Later that month, a graffiti-style mural (Figure 1) was created above the Plaza to protest the seizure of Adams Morgan Plaza that led to his death (Moyer 2022). Gonzales' death was met with widespread sympathy and public outrage.

On December 22, 2022, the DCCA granted Zuckerberg's appeal and remanded the case back to DC Superior Court to be heard in front of a jury (Howell 2022, Schwartzman 2022). It further reversed the prior ruling on January 12, 2021, that granted a summary judgment to the Defendants in the case (Glickman, Thomson, and Steadman 2018). The ruling from the DCCA was released back to the DC Superior court on March 3, 2023 after which the Plaintiffs filed a continuance to postpone the case by another two months (Superior Court of the District of Columbia 2017). On June 12, 2023, the Defendants filed another motion for a summary judgement (post-remand). In response, the Plaintiffs filed a motion to hold the case in abeyance because of Zuckerberg's retirement from the law practice (Kalorama Citizens Associations et al vs. SunTrust Bank Company et al, n.d.). Puig-Lugo would deny the motion on July 6, 2023, but transferred the case to the care of Judge Donald Walker Tunnage (Superior Court of the District of Columbia 2017).

Tunnage transferred the case back to Judge Todd Edelman, who originally heard the case; he accepted Zuckerberg's motion to withdraw from the case on August 10, 2023, and heard the details of the case again from the Plaintiff's new attorney, Amanda Fox Perry. On September 14, Tunnage heard the details of the case from the Plaintiff's new counsel and denied the Defendant's motion for a post-remand summary judgement. One month later, SunTrust (now Truist) passed off the deed of Adams Morgan Plaza to Jubilee Housing, a nonprofit organization local to Adams Morgan on October 13, 2023. Both parties filed multiple motions to extend the case until September 6, 2024, while they negotiate the use of the Plaza alongside Jubilee Housing's construction plans (Superior Court of the District of Columbia 2017).

Jubilee Housing published their plans for the plaza on April 19, 2024. Their proposal included 40 low-income housing units on the Plaza as well as an open space to restore previous Plaza activities (ERC Colbert & Associates 2024). Since then, numerous postings around the fences at Adams Morgan Plaza alert the surrounding neighborhood of Jubilee Housing's plans. One notice read:

> "New 7-story mixed-use building with 1 cellar level and 1 penthouse level. Parking in cellar; retail at street level; apartments on the 2nd-7th floors, and amenity space in the penthouse. A 4,095-sf public plaza is included at street level at the northern part of the site. The existing branch bank

building and public plaza will be demolished" (from Figure 8).

Based on the current postings in and around Adams Morgan, the Plaza is set to remain a feature of the neighborhood. While the "existing branch bank building and public plaza will be demolished," the notice intends to maintain the public plaza that has remained a central part of the Adams Morgan neighborhood community for the past 50 years. The visual plans for Jubilee's project show a new, revitalized public plaza in front of its apartment complex (Figure 9). On May 2, 2024, the Advisory Neighborhood Commission 1C (ANC) voted unanimously in favor of Jubilee Housing's proposed project which was shared in a letter by ANC Chairperson Peter Wood (Wood 2024).

A Contemporary Economic History

To complement the legal history provided about Adams Morgan Plaza after its re-acquisition, economic census data is used to provide an answer to the second central research question of this study: what factors determined its future? In short, *lowering* poverty rates within the study geography before Hoffman & Associates re-acquired the Plaza, *rising* poverty rates within the study geography before Jubilee Housing took over the Plaza, and an *increase* in housing units in all but two of the census tracts between 2017 and 2022 provides a potential resolution.

Turning first to poverty rates, it is important to note that between 2016 and 2017—the year when Hoffman & Associates re-acquired the Plaza from SunTrust—poverty rates *dropped* in all but two census tracts within the study geography (Figure 10). Census Tracts 38 and 55 each experienced an 11% increase in poverty between 2016 and 2017, while all others saw decreases ranging from 3% to 33%. The census tracts enclosing the area of the Plaza recorded the smallest decrease in poverty rates, only a 3% drop in census tract 40.01 and a 14% drop in census tract 40.02. These respective drops in poverty rates might suggest that Hoffman & Associates's desire to build upscale housing on the site of Plaza was motivated by improving economic conditions within the area. Decreasing poverty rates in the year before their acquisition of the Plaza area might provide positive reinforcement for Hoffman & Associates' decision to build luxury—as opposed to public or low-income—housing. On the other hand, most census tracts saw an increase in poverty rates between 2021 and 2022 (Figure 10). All but four census tracts—38.02, 40.01, 55.01, and 55.02—saw poverty rates increase; they rose as little as 10% and as much as 260% during that time proportionally. In fact, the census tract enclosing the plaza (40.02) saw a 35% increase in poverty rates between 2021 and 2022 and so did most census tracts that surrounded the plaza. The directly neighboring census tracts 39.02 and 42.01 saw a 260% and 173% rise in poverty rates between 2021 and 2022, respectively. Only the other directly neighboring census tracts 38.02 and 40.01 saw decreases in poverty rates that were 46% and 42% lower, respectively. The rise in poverty rates in the year before Jubilee Housing took over the Plaza might explain their choice to take over the site in October 2023. Further, these worsening economic conditions might have motivated Jubilee Housing to specifically propose low-income housing in April 2024 to address these issues.

Considering the total housing within the geography of this study provides an additional parallel avenue to analyze both Hoffman & Associates' and Jubilee Housing's specific involvement

in Adams Morgan Plaza. From 2012 to 2017—just before Hoffman & Associates re-acquired the Plaza—total housing units within the study geography remained relatively stable (Figure 11). Hoffman & Associates' involvement in the Plaza site comes before a rise in total housing units in most of the study geography between 2017 and 2022 (excluding census tracts 55 and 42.02 which saw a lower quantity of total housing units in 2022 than 2017). Acquiring the Plaza site during a time when the number of housing units was relatively stable might have been advantageous for Hoffman & Associates who sought to make high returns on their construction project. Despite the jump in total housing units from 2017 to 2022 in most of the study geography, poverty rates mostly worsened between 2021 and 2022. The simultaneous increase in housing units and poverty rates suggest that the housing units added from 2017 to 2022 did not address underlying economic issues within most of the study geography. This supports the hypothesis that Jubilee Housing's involvement was driven by worsening economic conditions and an increase in housing units that failed to address poverty. Jubilee Housing's involvement and commitment to building low-income housing would provide an intervention, giving DC residents "earning up to $90,400, or 60 percent of the area median income" to obtain stable housing and economic growth (Schwartzman 2023). In numerous studies using predictive models, existing data analysis, and novel phenomenological analysis from the US and around the world point to the positive impacts that stable housing can have on economic wellbeing, quality of life, social cohesion, health, and job stability (Akinsulire et al. 2024; Marçal, Choi, and Showalter 2023; Tunstall et al., n.d.; Palimaru et al. 2023; Hudiburg 2022; Baumstarck, Boyer, and Auquier 2015). Affordable housing cannot single-handedly ameliorate poverty or produce widespread social benefits, but when coupled with other interventions—like housing placement experts and proactive policies—it can make a significant impact in places like Adams Morgan ("Housing Policy and Urban Inequality: Did the Transformation of Assisted Housing Reduce Poverty Concentration? | Social Forces | Oxford Academic," n.d.; McClure 2008).

Based on the economic data evaluated in this section of the study, we can propose a possible answer to why Adams Morgan Plaza became involved in DC's housing landscape. From 2016 to 2017, a drop in poverty rates throughout most of the study geography could have motivated Hoffman & Associates to re-acquire the Plaza for their luxury housing complex. Improving economic conditions in the year prior might create a favorable outlook for their plan, which sought high returns from a higher-income client base. At the same time, a stability in total housing units between 2012 and 2017 might have inspired Hoffman & Associates to enter a stable landscape with little fluctuation in total housing metrics. Further, it is possible that Jubilee Housing's involvement was precipitated both by rising poverty rates from 2022 to 2023 and an increase in housing units from 2017 to 2022 within most of the housing geography. An increase in housing units alongside worsening poverty rates might have encouraged Jubilee Housing to propose a low-income housing solution for the Plaza to mitigate the problem. These findings are reasonable assumptions based on the data from the study geography, but they are not definitive. Ultimately, Hoffman & Associates and Jubilee Housing are both private groups: one a for-profit company, the other a 501(c)(3) nonprofit. Their rationale for steering the Plaza's future into the realm of DC's housing landscape might have been motivated by a combination of different factors. This analysis offers only a possible explanation that accords with both the chronology and proposed goals of each company.

Discussion

The historical inquiries within this study show how the full story of Adams Morgan Plaza both before and after its re-acquisition is plagued by two themes: punctuated equilibrium and conflict. Originally a term from evolutionary biology, 'punctuated equilibrium' describes a pattern of rapid change followed by long periods of stability. This phenomenon describes the full story of Adams Morgan Plaza both before and after its re-acquisition. The early history of the Plaza is a story of rapid transition within the multicultural backdrop of the Adams Morgan neighborhood. It experienced the tragedy of the Knickerbocker Theatre, the vibrancy of the Ambassador Theatre, the unsuccessful efforts of Perpetual Federal Savings Bank, and the plans of SunTrust bank to open a branch there after 1976. After 1976, the Plaza experienced a period of tranquility: the Adams Morgan community embraced its role as a public easement that offered ways for people to connect, socialize, and collaborate. For almost forty years, the Plaza existed as a public easement that brought joy to many. However, it would rapidly transition again, this time into the hands of Hoffman & Associates in 2017 when SunTrust decided to close their branch on 18th Street and Columbia Road. This was the moment when it entered DC's urban housing landscape. It was also when the Plaza's history became plagued by conflict. The ensuing legal battle over the purpose of the Plaza defined the site for almost seven years as the KCA and AM4RD waged a legal battle against Hoffman & Associates to preserve the public easement. The legal battle was so prolonged and thorny that eventually Jubilee Housing became involved in October 2023, solidifying the Plaza's eventual purpose as a housing location. This final transition into Jubilee Housing's hands would bring an end to the story of the Plaza and its history of punctuated equilibrium and conflict.

The economic data mobilized in this study proposes that poverty rates and changing quantities of housing units determined the future of the Plaza as a housing location. Early stability in housing units from 2012 to 2017 along with improving poverty rates from 2016 to 2017 in most of the study geography might substantiate Hoffman & Associates's rationale to re-acquire the Plaza from SunTrust in 2017. A rise in housing units (2017–2022) alongside increasing poverty rates (2021–2022) may help explain Jubilee Housing's involvement and proposal to build low-income housing. These data suggest a possible explanation to how the Plaza became a housing site, but do not offer a definite, undisputed rationale. Instead, the economic analysis of this study offers a potential insight into the other, more contemporary social histories that influenced the future of the Plaza.

The implications of this study are several. First, this paper elucidates the early history of an under-researched portion of Washington, DC that has undergone a series of rapid transformations. Secondly, this research offers an in-depth history of the legal battle that has determined the future of Adams Morgan Plaza that surfaces important insights into the way urban space is historically disputed. These findings offer a precedent for understanding future conflicts over the use and purpose of urban public space. Thirdly, the economic analysis provided in this study proposes a hypothesis about how public spaces like Adams Morgan

Plaza are selected for housing development. This element of the study provides a unique insight for future scholars to evaluate how housing is built, operationalized, and realized in multicultural, historical urban environments. Lastly, this investigation into the multilayered history of Adams Morgan Plaza provides a detailed narrative that pulls together many threads of journalistic, scholarly, and public inquiry. It offers a resource for future readers to return to the complex history of an important neighborhood fixture within one of DC's most diverse neighborhoods.

Though these implications are important, a few limitations exist within the study methodology. Beyond the physical barriers surrounding the plaza, the various historiographic analyses within this manuscript are hard—in theory—to generalize to other sites. The highly specific circumstances and history of the Plaza allow it to become a unique case study to explore privatization and urban development in one of DC's most multicultural neighborhoods. But trying to make a similar claim, or even replicate this work to other urban areas, is challenging given the highly opportune intersection of various conditions that precipitated the rationale for this study. Future scholars wishing to find similar sites to study would run into a few challenges positioning their research where the urban phenomena of this study are replicable or even exist in parallel. Moreover, the positionality of the author—who maintains a longstanding connection to DC—poses potential areas of interpretive bias within the study of this manuscript. To overcome this potential bias, the study aimed to use oral histories to supplement some of the findings, but the Plaza's closure limited this endeavor. Thus, potential interpretive biases might still exist within the scope of this study as external testimony was severely limited.

Conclusion

The findings of this study offer several critical implications for future scholarships, planning, and urban policy. First, by tracing the Plaza's history through the lens of punctuated equilibrium, this study reveals how periods of urban stasis often obscure deeper structural tensions that can resurface through moments of rapid spatial transformation. Urban planners and policymakers should recognize that even seemingly stable community spaces may harbor unresolved contestations around public use, property rights, and development that can quickly erupt under shifting economic or institutional pressures.

Second, the legal battle over Adams Morgan Plaza highlights the intricate governance challenges posed by contested urban public spaces. The Plaza demonstrates how ambiguous legal circumstances—formed by relationships within a community to public easements on private property—can become focal points of community resistance, litigation, and protracted negotiation. For policymakers, this case underscores the importance of clarifying legal and civic commitments attached to quasi-public spaces. Similarly, there is a need to strategies tools to mediate between private developers and long-standing community stakeholders. Third, the study's economic analysis raises important questions about how demographic and housing data are mobilized—strategically or retrospectively—to justify urban redevelopment. The correlation between shifts in poverty rates and housing stock with redevelopment decisions, while not causative, suggests that policymakers and developers alike often rely on macroeconomic indicators to substantiate their actions. Urban scholars and advocates should therefore pay close attention to how data-driven narratives, produced at the neighborhood and even census-tract level, are used to legitimize or contest spatial change.

Finally, this study offers a methodological contribution to the historiography of urban space. By weaving together archival research, economic data, and other historical sources (where possible), this study models an interdisciplinary approach to uncovering the layers of conflict embedded within a single site. Future researchers can use this approach to explore other under-documented urban spaces, particularly those at the intersection of racial diversity, economic vulnerability, and spatial redevelopment. Adams Morgan Plaza should not be viewed as an isolated case but as a cautionary tale and a teaching tool. It demonstrates the fragility of public space, the complexities of community resistance, and the uneven ways in which urban redevelopment unfolds. Its story can inform a more just and historically grounded approach to planning in multicultural cities—especially as U.S. urban centers continue to grapple with the threefold pressures of housing crises, gentrification, and historical-cultural preservation.

Data Availability Statement

Census datasets, spreadsheet analyses, and generated charts are available to use at the link and at the request of the author by email: https://doi.org/10.7910/DVN/LR0VVH. Original (digitized) legal documents and records used in this study are also available for viewing at the link and at the request of the author by email: https://doi.org/10.7910/DVN/FPAKNC.

Declaration of Interest

No potential conflict of interest was reported by the author.

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Appendices
Appendix A: Figures and Diagrams

Figure 1: Image of the graffiti-style mural above the closed Adams Morgan Plaza taken in March 2022; a worker can be seen power-washing the words from the wall above the Plaza (image courtesy of the author).

Figure 2: Image of Adams Morgan Plaza in May 2023, surrounded by fencing. A few blue benches can be seen in front of the fences on the sidewalk that borders the plaza (image courtesy of the author).
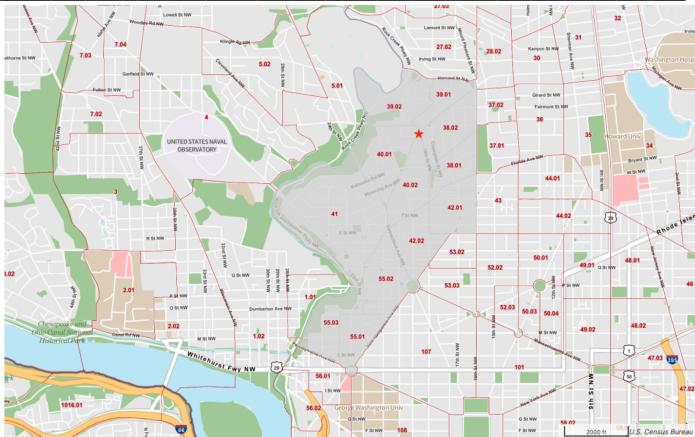
Figure 3: Census tracts of interest highlighted in grey with Adams Morgan Plaza marked by the red star at upper center (US Census Bureau from the Decennial Census).
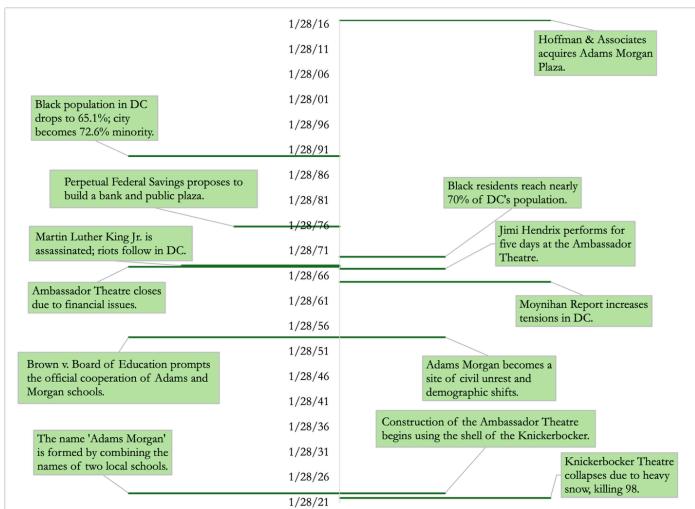
Figure 4: Timeline of the early history of Washington, DC coupled with important events in Adams Morgan from 1921 through 2017 (timeline courtesy of the author; information from Manning 1998 and Summers 2019)

Figure 5: Image of the collapsed Knickerbocker Theatre—located at right—on Columbia Road and 18th Street (image from the Library of Congress).(The Library of Congress 1922)
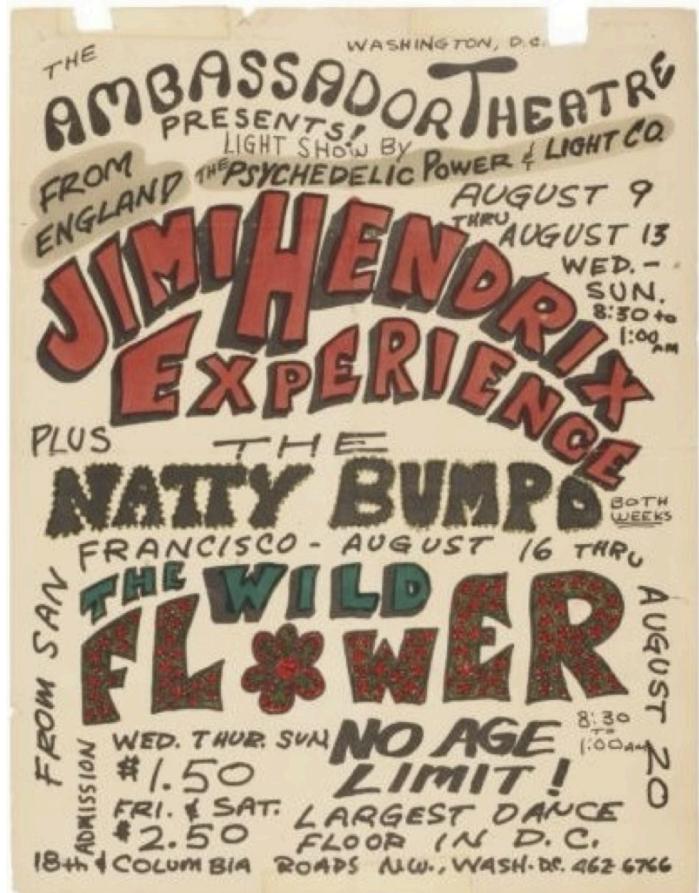
Figure 6: Poster advertising the Jimi Hendrix Experience at the Ambassador Theatre from August 9th through 13th, 1967. (Photo by Jeff Krulik).(Krulik 2017)
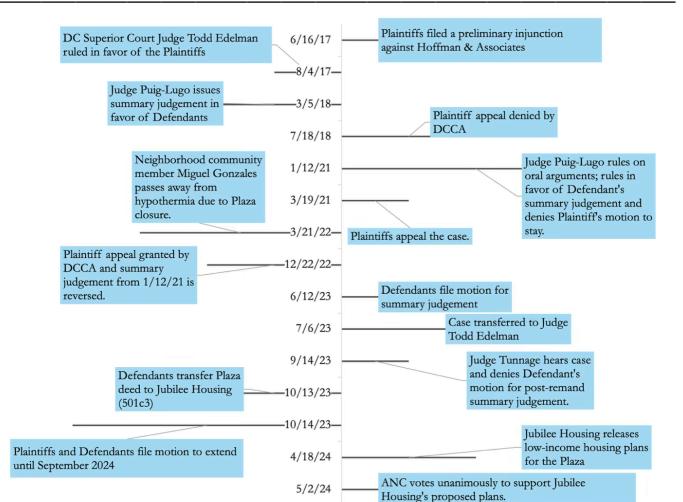
Figure 7: Timeline of the legal history of Adams Morgan Plaza (timeline courtesy of the author and events compiled from DCSC and DCCA records).

Figure 8: Notice of pending application for Jubilee Housing's upcoming project on Adams Morgan Plaza (photo courtesy of the author).

Figure 9: Rendering of the new Adams Morgan Plaza under Jubilee Housing's current design (image accessed through the DC Historic Preservation Office and authored by ERC Colbert & Associates).(ERC Colbert & Associates 2024)

| Short Census Tract	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
CT 38	10	9.6	10.6	11.1	9.4	10.4	7.7	8.9			
CT 38.01									1.7	4.6	5.8
CT 38.02									5	13.3	7.2
CT 39	6.8	11.2	10.3	9.8	9.8	8.3	4.4	3.4			
CT 39.01									5	4.1	4.5
CT 39.02									0.4	0.5	1.8
CT 40.01	2.7	2.2	2.9	4.4	3.6	3.5	2.7	3.1	1.5	5.9	3.4
CT 40.02	3.9	3.9	3.4	3.8	4.3	3.7	3.6	4.8	3.4	2.6	3.5
CT 41	6.1	6.4	6	5.7	6.3	5.1	4.5	4.8	5.2	5.9	6.5
CT 42.01	9.9	5.8	5.7	4.9	4.3	3.1	2.1	1.7	1.5	2.6	7.1
CT 42.02	7.6	7.3	8.4	7.4	7.5	5	5.1	6.2	16.2	13.9	15.5
CT 55	12.1	15.9	15.9	18.2	18.6	20.6	16.9	15.3			
CT 55.01									18	15.8	4.9
CT 55.02									11.7	12.4	11.3
CT 55.03									13.8	31.6	37.4

Figure 10: Table showing percentage of people within census tracts living below the poverty line from 2012 to 2022 (data from US Census Bureau from the American Community Survey 5-Year Estimates).(US Census Bureau, n.d.-c)
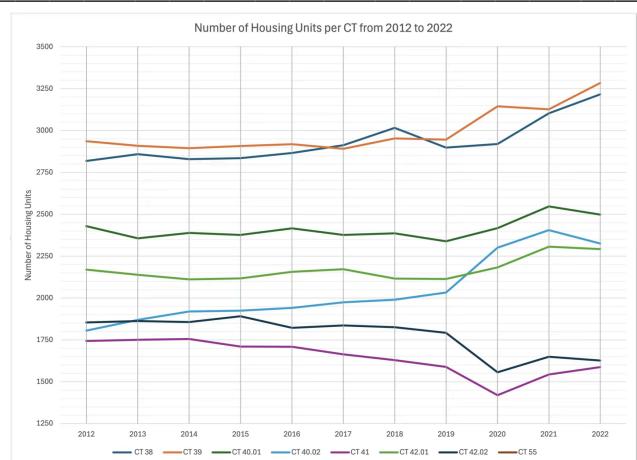

Figure 11: Chart showing total number of housing units within census tracts surrounding the plaza from 2012 to 2022 (data from US Census Bureau from the American Community Survey 5-Year Estimates).(US Census Bureau, n.d.-a)

Merleau-Ponty's Interpretation of Machiavelli: Nationalism, Dynamic Perspectives, and the Fabric of Society

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This essay examines how Niccolò Machiavelli's political philosophy and Maurice Merleau-Ponty's phenomenology overlap, emphasizing how they both offer valuable perspectives on nationalism, government, and social cohesiveness. Merleau-Ponty frames nationalism as a relational and anticipatory construct shaped by dynamic encounters, emphasizing perception, embodiment, and the lived experience. Renowned for his pragmatism, Machiavelli sees nationalism as a tool for strategy, supporting measures like assimilation and eradication to maintain peace and consolidate power. By contrasting these viewpoints, the essay looks at how their theories handle the difficulties of contemporary leadership in a divided and globalized society. Shared elements like flexibility, foresight, and the function of symbols in promoting unity are highlighted in the analysis. Additionally, it assesses their applicability to current concerns such as technological disruption, international cooperation, and populism. Both scholars emphasize how leaders must carefully balance inclusion and coercion in order to preserve social harmony. In addition to broadening our knowledge of political theory, this synthesis provides practical advice for negotiating the challenges of governance in a changing global environment.

Introduction

The convergence of philosophy and political theory provides significant insights on governance dynamics, societal cohesion, and the exercise of power. Maurice Merleau-Ponty, an innovative phenomenologist, emphasized perception as a dynamic and connected phenomenon [1]. His theories propose that human comprehension and societal frameworks are influenced by experiential realities and continual modification. Niccolò Machiavelli, conversely, is grounded in realism, promoting pragmatic approaches to leadership, conquest, and governance as examined in The Prince [2]. Their theories elucidate essential subjects such as nationalism, evolving perspectives, and the essence of society.

This essay connects Merleau-Ponty's phenomenological insights with Machiavelli's political techniques, examining their consequences for leadership and social stability. The study analyzes their perspectives on nationalism, adaptation, and societal cohesion, demonstrating their significance in confronting contemporary issues, including escalating populism and global wars. This synthesis enhances our comprehension of political theory and underscores its lasting relevance in a swiftly evolving world.

Nationalism and Society through Ponty and Machiavelli's Lens

Nationalism, a potent force for societal unification or division, is a persistent issue in the writings of Maurice Merleau-Ponty and Niccolò Machiavelli. Machiavelli's view on nationalism is grounded in pragmatic governance, highlighting control and power dynamics, whereas Merleau-Ponty's interpretation provides a phenomenological approach that emphasizes lived experiences, perception, and embodiment [1]. Collectively, their concepts offer an extensive framework for comprehending the function of nationalism within society.

Machiavelli perceived nationalism as a tactical instrument for consolidating heterogeneous groups under a singular power [2]. He contended that rulers must either assimilate or eradicate conquered populations to preserve stability and authority. Assimilation, as articulated by Machiavelli, entails adopting the language, habits, and religion of the subjugated populace to foster a sense of collective identity [3]. The Ottoman Empire's choice to incorporate aspects of Greek culture into its administration illustrates the efficacy of assimilation in strengthening authority [2]. Machiavelli suggested elimination as a solution when assimilation is impracticable [4]. Colonization, specifically, was a strategy he advocated to supplant indigenous populations with obedient settlers

[2]. This method mitigated opposition by undermining dissenters and incentivizing supporters [3]. Colonization frequently engendered enduring animosity among displaced communities, shown by the American military occupation of Okinawa, where residents faced isolation and oppression [2].

Conversely, Merleau-Ponty examined nationalism via the perspectives of perception and embodiment [1]. He contended that nationalism arises from personal experiences and the manner in which individuals view themselves within a collective context [5]. According to Merleau-Ponty, perception is dynamic and relational, continually influenced by interactions with others and the environment [5]. This viewpoint aligns with Machiavelli's focus on adaptation in leadership, underscoring the fluid and dynamic essence of nationalism as a social construct [6].

Both theorists acknowledged the significance of cultural symbols in promoting nationalism. Machiavelli asserted that rulers ought to embrace the customs and symbols of their subjects to convey legitimacy and cohesion [2]. Merleau-Ponty elaborated on this concept by highlighting the corporeal aspect of cultural identification, positing that communal symbols and rituals strengthen collective affiliation and social unity [7]. These communal behaviors function as perceptual anchors that synchronize individual identities with the broader national framework [5].

The anticipating aspect of perception, a key idea in Merleau-Ponty's philosophy, is also reflected in Machiavelli's political tactics [1]. Merleau-Ponty contended that individuals and cultures perpetually envision future possibilities grounded in current perceptions [5]. This corresponds with Machiavelli's counsel for leaders to take preventive measures to neutralize possible dangers before they intensify [4]. Both methodologies emphasize the significance of foresight and adaptability in managing the intricacies of nationalism.

Both thinkers indirectly addressed the policy of supporting weaker factions within a society. Machiavelli counseled rulers to safeguard vulnerable groups to establish alliances and counteract dominant factions, thus promoting stability [8]. Merleau-Ponty's focus on the intersubjective aspect of perception underscores the relational dynamics crucial for promoting inclusion and stability within a nation [6]. By acknowledging the interdependence of individuals and their communities, both theorists emphasize the significance of relational governance in tackling the issues posed by nationalism [1].

Nationalism depends on narratives that link individuals to a common past and future. Machiavelli underscored the significance of historical continuity in legitimating political authority [4]. Rulers who harmonized with historical narratives were more effectively able to cultivate loyalty and trust among their followers [3]. Merleau-Ponty emphasized that these narratives are embodied and experienced collectively, influencing individuals' perceptions of their roles within a nation [9].

Both philosophers warn of the dangers of unmanaged nationalism. Machiavelli cautioned that severe oppression and exclusion may incite rebellion and society disintegration [4]. Merleau-Ponty's relational perspective on perception indicates that disregarding the emotional and perceptual aspects of nationalism may alienate individuals and weaken societal cohesion [10]. This collective admonition highlights the precarious equilibrium leaders must sustain while promoting national cohesion [11].

The relationship between nationalism and international collaboration is a significant contemporary problem. Globalization has intensified the interconnectedness among nations, compelling leaders to balance the advancement of national identity with the requirements of an interconnected globe [12]. Merleau-Ponty and Machiavelli provide useful insights for addressing this contradiction, highlighting the importance of adaptation, foresight, and relational comprehension in government.

Merleau-Ponty's Phenomenology and Its Overlap with Machiavelli

Maurice Merleau-Ponty's phenomenology offers a profound and nuanced perspective on perception, embodiment, and human experience [13]. His philosophy highlights the dynamic and relational nature of perception, suggesting that human understanding is shaped by lived interactions with the world and others [13]. Niccolò Machiavelli emphasizes adaptability, foresight, and the manipulation of societal structures. Despite their differing disciplines and approaches, their ideas share critical overlaps, particularly regarding perception, leadership, and the dynamics of societal control.

Merleau-Ponty argued that perception is not a passive process but an active, relational interaction between the individual and their environment [5]. This view aligns with Machiavelli's emphasis on adaptability in leadership [13]. Machiavelli believed that rulers must remain attuned to the shifting dynamics of society, adjusting their strategies to meet the demands of the moment [3]. For both thinkers, the ability to perceive and respond to change is central to maintaining stability and control.

One of Merleau-Ponty's key contributions to philosophy is the concept of "flesh," which encapsulates the interconnectedness of individuals and their environments [5]. This notion parallels Machiavelli's principle that rulers must immerse themselves within the cultural fabric of their societies to foster unity and legitimacy [2]. For example, Machiavelli recommended that rulers adopt the traditions, symbols, and customs of their subjects to project authority and strengthen bonds with their people [3]. By embodying these cultural markers, rulers create a sense of shared identity, reinforcing societal cohesion [7].

Merleau-Ponty also emphasized the anticipatory nature of perception, where individuals and societies project future possibilities based on present experiences [5]. This forward-looking perspective resonates with Machiavelli's advice for rulers to act preemptively, eliminating potential threats before they become significant dangers [3]. Anticipation and foresight, therefore, emerge as crucial traits for effective leadership in both frameworks. Leaders who can perceive emerging trends and act decisively are better equipped to navigate the complexities of governance and maintain societal order [6].

Symbolism plays a significant role in leadership for both Merleau-Ponty and Machiavelli. Machiavelli recognized the importance of symbols in legitimizing authority, advising rulers to embody cultural symbols to align themselves with their people's values [3]. Merleau-Ponty, in turn, explored how shared symbols and rituals shape collective identity. These symbols serve as perceptual anchors, fostering a sense of belonging and unity within a community [9]. Together, their insights highlight the power of symbolism in creating and sustaining societal cohesion.

Another area of overlap between the two thinkers is their

focus on relational dynamics in governance. Merleau-Ponty's philosophy emphasizes the intersubjective nature of perception, where meaning emerges through interactions between individuals and their communities [5]. This relational approach aligns with Machiavelli's principle of supporting weaker factions within society [14]. Machiavelli advised rulers to protect vulnerable groups as a means of counterbalancing dominant factions, thereby fostering alliances and maintaining stability [8]. By recognizing the interconnectedness of individuals and their communities, both thinkers underscore the importance of fostering relationships that promote mutual benefit and stability [15].

Leadership, according to both Merleau-Ponty and Machiavelli, requires a deep understanding of the emotional and perceptual dimensions of governance. Machiavelli emphasized the need for rulers to project confidence, decisiveness, and strength to maintain their authority [3]. Similarly, Merleau-Ponty highlighted the role of perception in shaping public trust and collective action. Leaders who fail to consider these perceptual dimensions risk alienating their subjects and undermining their legitimacy [10].

The tension between coercion and persuasion is another theme explored by both thinkers. Machiavelli acknowledged the necessity of coercion in certain situations but warned against its overuse, cautioning that excessive oppression breeds resentment and rebellion [3]. Merleau-Ponty's relational philosophy reinforces this caution, suggesting that neglecting the emotional and perceptual aspects of governance can destabilize societal harmony [6]. Effective leadership, therefore, requires a balance between pragmatic action and relational sensitivity.

Merleau-Ponty's phenomenology also provides a unique lens through which to interpret Machiavelli's strategies for fostering unity and stability. By framing nationalism and governance as embodied and perceptual phenomena, Merleau-Ponty expands our understanding of the mechanisms that sustain societal cohesion [16]. His emphasis on the lived experience of individuals within a collective framework complements Machiavelli's practical insights into leadership, highlighting the interplay between perception, embodiment, and power [12].

In a modern context, the synthesis of Merleau-Ponty's and Machiavelli's ideas offers valuable guidance for addressing contemporary challenges in governance and societal stability. Globalization, rising nationalism, and technological advancements have transformed the dynamics of leadership, requiring leaders to navigate increasingly complex and interconnected systems [17]. By integrating Merleau-Ponty's focus on relational perception with Machiavelli's pragmatic strategies, leaders can better understand and respond to the evolving needs of their societies [7].

Both thinkers also underscore the importance of adaptability in leadership. For Machiavelli, adaptability is a practical necessity for maintaining power in the face of changing circumstances [3]. For Merleau-Ponty, adaptability reflects the fluid nature of perception, where individuals and societies continuously reshape their understanding of the world based on new experiences [5]. Together, their perspectives emphasize the need for leaders to remain flexible and responsive to change, balancing tradition with innovation.

Interpreting Dynamic Perspectives in Modern Contexts

The synthesis of Maurice Merleau-Ponty's phenomenology and Niccolò Machiavelli's political theories provides a valuable framework for analyzing contemporary issues in governance, nationalism, and societal dynamics [6]. Their combined insights reveal how perception, power, and adaptability shape modern leadership, particularly in the context of globalization, populism, and international conflicts.

Nationalism, as a socio-political force, serves as a focal point for understanding the application of their ideas in modern contexts [18]. Merleau-Ponty argued that nationalism is rooted in lived experiences and the shared perceptions of individuals within a collective [5]. This view complements Machiavelli's emphasis on the strategic cultivation of national identity [1]. According to Machiavelli, rulers should align themselves with the cultural and symbolic values of their people to foster unity and loyalty [3]. Leaders who fail to resonate with these shared perceptions risk alienating their constituents and undermining their authority [9].

Populist leaders exemplify these dynamics by adopting rhetoric and symbols that reflect the identities of their constituents [19]. This approach mirrors Machiavelli's principle of assimilation, where rulers must immerse themselves in the cultural frameworks of their societies to consolidate power [3]. Merleau-Ponty's philosophy of relational perception further explains how these leaders navigate the complexities of collective identity [15]. By aligning their narratives with the lived experiences of their followers, populist leaders create a sense of belonging and shared purpose [6].

Globalization presents additional challenges to leadership, as it necessitates balancing national identity with the demands of an interconnected world [20]. Machiavelli's emphasis on adaptability provides guidance for navigating these complexities. He advised rulers to adjust their strategies to respond to shifting circumstances, a principle that resonates with Merleau-Ponty's dynamic view of perception [5]. Leaders who fail to adapt to the realities of globalization risk losing relevance and influence in an increasingly competitive international arena [7].

The role of perception in shaping societal cohesion also finds relevance in contemporary geopolitics. Merleau-Ponty's insights into the anticipatory nature of perception suggest that leaders must remain attuned to emerging trends and future possibilities [5]. This perspective aligns with Machiavelli's advocacy for preemptive action to neutralize potential threats before they escalate [3]. For example, during the Cold War, the United States preemptively weakened the Soviet Union through economic and military strategies, reflecting both thinkers' emphasis on foresight and adaptability [21].

Symbolism remains a powerful tool in modern leadership, as it reinforces national identity and fosters societal cohesion [22]. Machiavelli recognized the importance of symbols in legitimizing authority, advising rulers to embody cultural markers that resonate with their people's values [3]. Merleau-Ponty expanded on this idea by exploring how shared symbols and rituals shape collective identity. These symbols, whether manifested in national flags, anthems, or cultural traditions, serve as perceptual anchors that align individuals with the larger collective [9].

Both thinkers also highlight the risks associated with the misuse of power and the neglect of relational dynamics. Machiavelli warned against the overuse of coercion, cautioning that excessive oppression breeds resentment and rebellion [3]. Similarly, Merleau-Ponty emphasized the importance of relational governance, suggesting that neglecting the emotional and perceptual dimensions

of leadership can destabilize societal harmony [10]. These warnings underscore the delicate balance leaders must maintain to foster stability without alienating their constituents.

In an era marked by technological advancements, the interplay between nationalism and international cooperation takes on new dimensions [23]. Social media and digital platforms have amplified the ways in which perceptions are shaped and shared, creating opportunities and challenges for leaders [24]. Merleau-Ponty's emphasis on relational perception offers insights into how leaders can navigate this digital landscape. By engaging with diverse perspectives and fostering inclusive narratives, leaders can mitigate polarization and promote cohesion [12].

Machiavelli's strategies for maintaining power also find resonance in the modern context of climate change and global crises [2]. Addressing these challenges requires leaders to act decisively and anticipate future risks, a principle central to both Machiavelli's and Merleau-Ponty's frameworks [5]. Leaders who fail to address these issues risk eroding public trust and undermining their legitimacy on the global stage [7].

Ultimately, the synthesis of Merleau-Ponty's and Machiavelli's ideas offers a comprehensive framework for understanding the complexities of modern governance. By integrating Merleau-Ponty's focus on perception and embodiment with Machiavelli's pragmatic strategies, leaders can better navigate the challenges of nationalism, globalization, and societal cohesion. Their combined insights underscore the importance of adaptability, foresight, and relational governance in addressing the evolving needs of contemporary societies.

In conclusion, the synthesis of Maurice Merleau-Ponty's phenomenology and Niccolò Machiavelli's political theory offers profound insights into leadership, nationalism, and societal dynamics. Through the lens of Machiavelli, nationalism is a tool for power consolidation, relying on strategies of assimilation, elimination, and preemptive action. Merleau-Ponty enriches this perspective with his emphasis on perception, embodiment, and relational dynamics, highlighting the lived experiences and symbols that bind societies together.

Both thinkers converge on the importance of adaptability, foresight, and relational governance. In modern contexts, their ideas resonate in addressing the challenges of globalization, rising populism, and technological advancements. Leaders who integrate Machiavelli's pragmatism with Merleau-Ponty's focus on perception are better equipped to navigate complex political landscapes.

By bridging philosophy and political practice, Merleau-Ponty and Machiavelli offer enduring frameworks for understanding the evolving needs of governance and society, emphasizing balance, inclusion, and strategic foresight.

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Perfect Imperfection: Findings Between Friend-Specific Perceived Pressure for Perfection and Self-Reported Anxious Symptoms Among College Students

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The current study investigates friend-specific perceived pressure for perfection (PPP) and self-reported anxious symptoms among college students. Prior research has suggested an association between PPP, psychopathological disorders, and maladaptive behaviors. For our survey, we utilized a novel PPP scale tailored to young adults and the GAD-7. From that data (N = 63) participants recruited from Santa Barbara City College, the survey found a significant correlation between friend-specific PPP and self-reported anxious symptoms. Following the survey we conducted a between-subjects experiment (N = 130) that suggests that PPP may cause anxious symptoms. These findings demonstrate the importance of addressing friend-specific PPP in clinical interventions aimed at reducing anxious symptoms as well as perfectionism research as a whole. Additionally, our survey contributes a novel scale for assessing friend-specific socially prescribed perfectionism for future research.

Socially prescribed perfectionism is a multifaceted concept encompassing high standards and critical self-evaluations predicated on relationships where a subject views a pressure to maintain these attributes. This consequently, has deleterious effects that can contribute to relationship dysfunction, and maladaptive coping not only in the one holding the belief but also in their social interactions and relationships (Flett et al., 1997; Hewitt et al., 2006,2018 as cited in Kim et al., 2024). This has garnered significant attention within social psychology and behavioral science in recent years. This phenomenon is particularly consequential among college students where academic and social pressures intersect immensely. Moreover, the concept of Perceived Pressure for Perfectionism (PPP), which entails elevated levels of friend-specific socially prescribed perfectionism within friendships, is linked to nuanced variations of socially prescribed perfectionism within the multidimensional framework of perfectionism theory (Hewitt & Flett, 1991). Socially prescribed perfectionism is more commonly associated with interpersonal conflict (Mushquash & Sherry, 2012 as cited in Kim et al., 2024), depressive symptoms (Smith et al., 2016 as cited in Kim et al., 2024), and problematic drinking (Bardone-Cone et al., 2012 as cited in Kim 2024).

Furthermore, in relatively recent epidemiological surveys, the lifetime prevalence rate of anxiety disorders ranges from 4.1% to 6.6% (Lépine, 2002). In a meta-analysis of epidemiological anxiety studies the sex-specific 1-year and lifetime prevalence rates were generally found to be about twice as high for women, compared with men, and fell primarily in the ages of 18-64 (Somers et al., 2006). However, since the COVID-19 pandemic, there has been an observed threefold increase in anxiety rates in the general population (Bueno-Notivol et al., 2021; Santabarbara et al., 2020 as cited in Qi et al., 2022).

Perfectionism has repeatedly been associated with relationship problems, problematic drinking and difficulty handling stress, and depressive symptoms (Chang & Rand, 2000; Hewitt, Flett, Sherry, & Caelian, 2006; Mackinnon et al., 2012 as cited in Mackinnon et al., 2014). Additionally, studies examining multidimensional perfectionism and anxiety found that maladaptive perfectionism is associated with higher levels of anxiety (Gnilka et al., 2011; Stoeber et al., 2014). Finally, in addition to these Tian et al., (2024) demonstrated maladaptive perfectionism was positively associated with psychological distress and career indecision (Tian et al., 2024).

Our current study aimed to advance the research of friend-specific socially prescribed perfectionism. Many studies presuppose that either the presentation of PPP derives strictly from one friend or assume that PPP derives from lower levels of friendship intimacy rather than vice versa- which leads to biased scales or inconsistent research. With this backbone, we devised a novel Friend Specific Socially Prescribed Perfectionism Scale (PPP) as we wanted to examine if the general expectations that are placed on individuals by their friends lead to a perceived pressure for perfection within friendships and if that positively correlates/results with high levels of self-reported anxious symptoms. In addition to a survey examining an association, we further conducted an experiment to examine possible causality between PPP and anxious symptoms.

H survey) Perceived Pressure for Perfection Within Friendships Is likely to be associated with high levels of self-reported anxious symptoms.

H experiment) Perceived Pressure for Perfection Within Friendships causes high levels of self-reported anxious symptoms.

R1) Will those with higher levels of PPP have higher anxious symptoms?

Survey Methods

Participants
The participants were N =63 students enrolled at Santa Barbara City College. This was a non-random convenience sample with neither gender nor specific age restraints. The participants were recruited from emails which were provided with a link to a survey on Google Forms. 17.5% of participants identified as male, 81% identified as female, and 1.6% identified as non-binary. Approximately 77.1% of the participants were aged 24 or younger, and 22.9% were 25 or older.

Design and Measures
The final survey consisted of 22 questions: 3 covariates: age, gender, and an open-ended major question. 2 nominal questions, and two scales (totaling 15 interval Likert questions). The initial survey was peer-reviewed by 10 college students enrolled in our Research and Methods *(PSY 200) course.*

Friend Specific Socially Prescribed Perfectionism Scale
To develop our novel PPP scale, we incorporated/altered questions found in the Frost Multidimensional Perfectionism Scale (FMPS) (Hewitt & Flett, 1991) and Other-Oriented Perfectionism-Junior Scale (Hewitt et al., 2022), as well as adding our own to create an 8-question measure catered to a young-adult demographic (College students) and tailoring it to friend-specific socially prescribed perfectionism. Participants were required to respond to questions (e.g., "I am uncomfortable showing my friends that I am not perfect," "What my friends think of my partner is important," "I must always appear to be perfect to my friends") with the available responses of an interval Likert scale (1 = Strongly Disagree and 5 = Strongly agree). While scales for friend-specific socially prescribed perfectionism have been used in prior research they either have yet to prove acceptable internal reliability, have not been replicated, were used longitudinally, or were generally not how we wanted to operationalize this variable.

Anxiety Scale
To assess our participants' self-reported anxiety, we utilized the Generalized Anxiety Disorder-7 scale (GAD-7; Spitzer et al.,2006). Participants rate the frequency of experiencing these symptoms on a ratio Likert scale of 0-3 on how much they identify with each question (0 = Not at all, 1 = Several days, 2 = More than half the days, 3 = Nearly every day). The GAD-7 has exceptional reliability with a reliability coefficient of Cronbach's α of 0.895, greater than the recommended value of 0.80 (Dhira et al., 2021). Additionally, The GAD-7 has good construct validity with a KMO coefficient of 0.915 which exceeds the recommended value of 0.6 (Dhira et al., 2021). We used responses from the question "worrying too much about different things" from the GAD-7 for one of our Spearman's Rho tests. Additionally, the cumulative scoring from the GAD-7 was used in an additional Spearman's Rho in relation to the cumulative scoring from the PPP scale.

Procedure
We first recruited participants with a flier that attracted our audience and also contained information about our research. This flier was distributed throughout multiple psychology courses at Santa Barbara City College. The participants were informed that they would complete an anonymous survey done on Google Forms through a QR code in our flier. In exchange, they could receive extra credit for participating (was to the discretion of their professor). The survey contained informed consent that ensured confidentiality, a trigger warning, a general outline of the goal, and other necessary information per APA and IRB regulations and guidelines. The survey included 3 covariates: age, gender, and an open-ended major question, 2 nominal questions, and two scales (totaling 15 interval Likert questions). The survey takes approximately 4 minutes to complete. Later we analyzed the results with SPSS using Spearman's Rho and Chi-squared tests.

Survey Results
A total of 63 participants completed our survey. The majority (81%) reported that they were female-identifying, while 17.5% of participants were male-identifying, and 1.6% were nonbinary-identifying. Of these 63 participants, roughly 43% reported that they were psychology majors. Of the other majors recorded, 16% of participants reported majoring in health-related fields, such as biochemistry, biology, and nursing, and 6% declared pursuing a business or communications degree. The remaining ~35% of participants had either recorded themselves as undecided or had differing majors, of which all other majors only made up ≤ 1% of the survey population. Given that the majority if not all of the participants are from psychology classes, it follows logically that nearly half were psychology majors. Moreover, considering that psychology courses are often a prerequisite for health-related majors,

it makes sense that a large portion of participants fell into this category. Additionally, for those outside of psychology and health majors, the interest in psychology common for introductory social science requirements likely played a role in their participation.

Outcome 1

To examine the relationship between PPP within friendships and anxious symptoms we conducted a 2x2 chi-square test. This test allowed us to see if there was a relationship between the two variables. We had chosen two questions in our survey to represent each of our nominal variables, these being V1: "Do you find yourself constantly comparing yourself to your friends due to pressure for perfection?" (yes/no), and V2: "Frequently, I think about the errors I've made while in the company of my friends." (yes/no). These questions enabled us to identify any relationship between the two variables through the chi-square test. 77.5% of participants who had answered yes to frequently thinking about the errors they have made while in the company of friends also reported yes to finding themselves constantly comparing themselves to their friends. In contrast, 22.5% of participants who answered yes to frequently thinking about the errors they have made while in the company of friends did not report constantly comparing themselves to their friends.
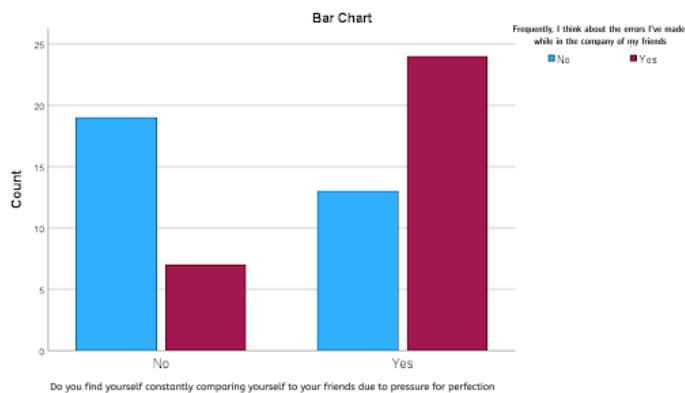

Figure 1

Thus, this difference was statistically significant: $\chi2(1, N = 63) = 8.795, p = 0.003$.

Outcome 2

Following our 2x2 Chi-square test, we employed a Spearman's rho which we used to find a statistically significant relationship between V1: "I keep my faults to myself" and V2: "Worrying too much about different things". Our V1, "I keep my faults to myself", was from the PPP scale and thus response options were the aforementioned 1-5 Likert scale. As for our V2, "Worrying too much about different things" was from the GAD-7 thus, the response options were the aforementioned 0-3 Ratio scale. Our correlation coefficient was 0.080 with a P-value of .532. Due to the large P value, surpassing the alpha level (0.05) and a correlation coefficient far from 1, the analysis suggests a non-significant correlation between the variables assessing PPP and anxious feelings: $(r_s(1) = 0.080\ p =.532)$.

Outcome 3

Conducting another Spearman's Rho analysis, we decided to use the coding of our PPP scale and the coding for the GAD-7 given by Spitzer (GAD-7; Spitzer et al., 2006). Among participants, 73% reported exhibiting moderate to high perceived pressure for perfection from friends (21-37). In contrast, 27% of participants scored low (10-20) on the PPP scale when it came to their perceived pressure of perfectionism from friends. As for the GAD-7 scores, 62% of participants reported moderate to severe anxious symptoms having cumulative scores of 10-21. Participants who scored on the low end of the GAD-7 expressed that they experienced little amounts of anxious feelings, less often, making up 38% of participants in our study. The correlation coefficient we concluded from our Spearman's rho analysis is significant at the .05 alpha level (0.289). Similarly, our P-value (.021) remained under the .05 level which represents a statistically significant result $(r_s(1) = 0.289\ p =.021)$.
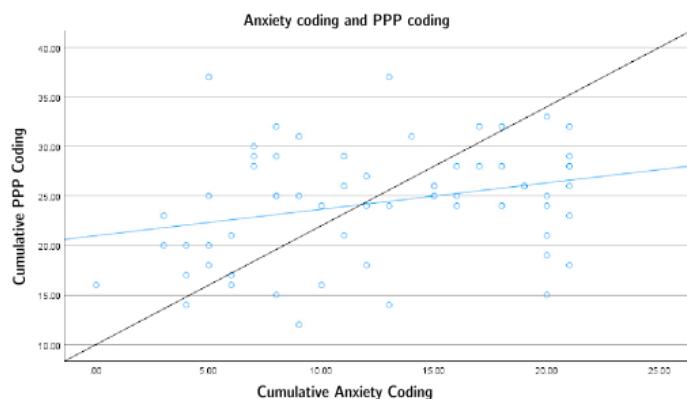

Figure 2

These two cumulative scales we used to determine the significance of PPP and anxious feelings have demonstrated a moderate positive correlation between PPP and anxious symptoms.

Outcome 4

Lastly, to analyze the consistency of responses within the PPP scale we ran another Spearman's rho on two variables within the scale. While this doesn't necessarily contribute to showing correlational data between anxious symptoms and PPP, it allows us to evaluate internal consistency within our scale loosely. With this parametric test, we utilized the two variables. V1: "I keep my faults to myself" with V2: "I must always appear perfect to my friends." The results showed 61.8% and 39.6%, respectively, answered 3 and above to the questions. This resulted in a correlation coefficient of .430 and a p-value of < 0.01. This suggested a statistically significant correlation: $(rs(1) = 0.430\ p = < 0.01)$. Thus, this test suggests that there is a correlation between individuals keeping their faults to themselves and also feeling that they must always appear perfect to their friends. In addition to Spearman's Rho, we also conducted a reliability coefficient Cronbach's α to assess the reliability of our PPP scale in its entirety. The obtained reliability coefficient Cronbach's α was 0.71 demonstrating moderate reliability.

Experiment Methods

Participants

Our experiment sample consisted of (N = 130) students at Santa Barbara City College. The majority of our participants (77.7%)

identified as female, while 21.5% identified as male, and .8% identified as non-binary. More than half (61.5%) of our participants were between the ages of 18-20, 20.8% were participants between the ages of 21-23, and 14.6% were ages 25+, our smallest age demographic was 23-24 with 4 participants (3.1%).

Design and Measures
We ran a between-subjects experiment. Participants were asked whether their birthday was odd or even to be assigned to the experimental or control group. The complete experiment consisted of 2 covariates, 2 simulated questions, and 14 GAD-7 questions (7 per test).

Independent Variable: A Perceived Pressure For Perfection Within Friendships
Our independent variable was a perceived pressure for perfection within friendships. To induce this perception, we utilized a series of open-ended questions depicting simulated scenarios to elicit either a high perceived pressure or low perceived pressure for perfection. Both the control and experimental group's scenarios followed the same general premise: "Imagine you are part of a very close group of friends who have known each other for years. Recently, the group decided to organize a surprise birthday party for one of your friends... design the party with this in mind." However, the experimental group had the addition of "As the planning progresses, you notice a heightened expectation for the perfect party among your friends." Following this prompt participants were allowed to change their design after receiving a text message from one of their friends. The experimental group's prompt was "One of your friends messaged you while you were creating the party and said everyone is expecting this to be the best surprise party ever. Will you change your party design? If so, how?" while the control group's prompt was "One of your friends messaged you while you were creating the party and said they were really excited. Will you change your party design? If so, how?"

Dependent variable: Anxious Symptoms
To measure anxious symptoms we used the difference of the summation of the combined pre-test and post-test scores of the GAD-7. The GAD-7 consists of 7-point interval Likert scale questions (e.g., "Feeling nervous, anxious, or on edge", "Being so restless that it is hard to sit still", etc.,) ranging from 0-3. We utilized this method as we wanted to evaluate the temporal precedence between groups and ensure that there was no selection effect in our experiment.

Procedure
Participants were recruited from an email distributed throughout multiple psychology courses at Santa Barbara City College from the Psychology Department. The experiment was to be completed through Google Forms from 4/19/2024 to 4/28/2024 through a link attached to the email. Participants were informed that there was potential extra credit as compensation for completing the experiment. Participants were greeted with informed consent to which they had to agree to participate. Participants were informed that the experiment is both voluntary and anonymous as well as making them aware of their ability to opt out at any moment while completing the experiment. Participants were notified of the potential risks of participating in our experiment. Including

confidentiality, a trigger warning, a general outline of the goal, and other necessary information per APA and IRB regulations and guidelines. For both groups, the experiment included 2 covariates: age and gender, 2 simulated scenarios, and 14 GAD-7 questions (7 per test). The experiment takes approximately 10-15 minutes to complete.

Experiment Results
A total of 130 participants had completed our experiment. The majority (77.7%) reported that they were female-identifying, while 21.5% of participants were male-identifying, and .8% were nonbinary-identifying. The majority of participants ranged from the ages 18-20 making up (61.5%) of our experiment population. Those who had an odd-numbered birthday were put into our experimental group (N=66) and those with even birthdays were in our control group (N=64).

Outcome
A t-test was then conducted following our experiment to compare the differences in scores of pre-test - post-test in both our control and experimental groups using the GAD-7. There was a statistically significant difference in the pre-test and post-test scores based on the GAD-7 between the experimental group with the high-pressure simulated experience (M = .4545; SD = 2.17) and the control group in the low-pressure simulated environment (M = 4.17; SD = 3.07),
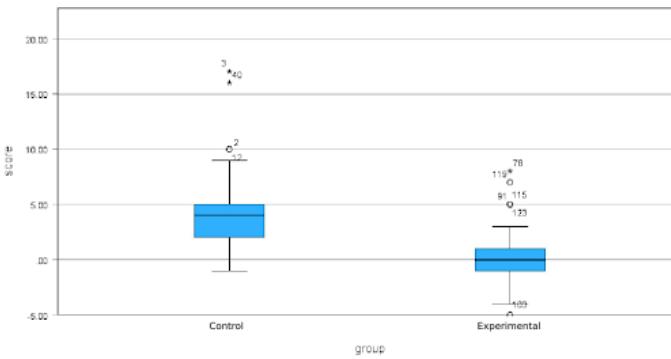

Figure 3

t(128) =7.985, p =<.001. These results demonstrated that participants in the experimental group developed more anxious symptoms than those in the control group after completing the simulated scenarios. Thus, suggesting that Perceived Pressure for Perfection from friends causes anxious symptoms.

Discussion
In our survey, we aimed to establish an association between friend-specific perceived pressure for perfection (PPP) and anxious symptoms. After our survey, we conducted an experiment that aimed to establish a causal relationship between PPP and anxious symptoms. This discussion will interpret our findings with the consideration of existing literature, methodological considerations, implications, limitations, and future research.

Interpretation of Findings
Aligning with our hypothesis and research questions, the majority of results from our survey suggested a statistically significant correlation

or difference between PPP and anxious symptoms. The result that supported our hypothesis most discernibly was the coding between our novel PPP scale and the coding for the GAD-7. These results supported our belief that higher levels of friend-specific PPP are associated with more self-reported anxious feelings.

The experiment maintained the congruency established by the survey. The experiment allowed us to evaluate the temporal precedence of PPP and anxiety and the results suggested that PPP was the cause of the anxious symptoms. While limitations soon to be discussed were present, we believe by the extreme significance between the experiment and control group that there were no confounding variables responsible for the outcomes. Thus we were able to establish that friend-specific PPP causes higher reporting of anxious symptoms.

Comparison with Previous Research
While we are the first to establish a causal relationship between friend-specific PPP and anxious symptoms, our findings align with previous research. Past research has established the relationship between psychopathological disorders and PPP (Kim et al., 2024) and more specifically multidimensional perfectionism generally (Tian et al., 2024; Gnilka et al., 2011) Additionally, our study contributes to the existing literature by using a novel friend specific socially prescribed perfectionism scale tailored to young adults.

Methodological Considerations & Limitations
Several methodological considerations deserve discussion. First, by using a survey that relies on self-reporting, the possibility of self-desirability bias is a big factor. We attempted to mitigate this in both the survey and experiment by having completely anonymous responses and informing participants there is no right or wrong answer. While we hope to alleviate this bias, we can't completely relieve it. While the GAD-7 has good reliability and consistency, future research could employ multiple assessment tools not limited to the GAD-7 alone. Additionally, for sample recruitment, we used a non-random convenience sample from Santa Barbara City College which limits our generalizability as well as our external validity. Future research should aim to recruit diverse participants from different populations to mitigate these factors. Lastly, we used simulated scenarios for our experiment. Friendships are multifaceted intricate physical, emotional, and psychological relationships built over time. Our use of simulated scenarios might not be accurately representative of real friendships and their implications on an individual's mental health.

Implications and Future Research
Our findings have implications for clinicians targeting perfectionism and/or anxious symptoms. Clinicians who apply interventions that address friend-specific socially prescribed perfectionism and promote healthy coping, could mitigate anxious symptoms and enhance overall mental health. Additionally, future research should continue the study between PPP and anxiety as well as explore potential ways to help such as social support or coping mechanisms.
Researchers interested in utilizing our novel PPP scale should contact David Farugie, dfarugie@gmail.com.

Conclusion
To conclude, our research was able to establish strong relationships between PPP and anxious symptoms. We encourage researchers to continue exploring these variables and examine possible clinical interventions that can help mitigate the deleterious effects associated with PPP. We also implore researchers to inspect possible reductions to maladaptive perfectionism within friendships.

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Resist With Care: The Complexity of Masculinity in Men's Prisons

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This paper investigates how incarcerated men in the United States utilize counter-hegemonic masculinities to resist the dehumanizing aspects of the carceral system as a whole. Literature on hegemonic masculinity, prison masculinity, and hybrid masculinity explore how dominant forms of masculinity shape behaviors and identities in different contexts. In this paper, 30 stories written by 27 incarcerated men for the Prison Journalism Project are analyzed using the content analysis method to identify themes of emotional expression, crossing racial barriers, acts of kindness, and animal companions. These narratives are contrasted with the dominant literature on hypermasculinity within prisons. The paper reveals that expressions of emotion, empathy, and generosity serve as forms of resistance against the prison system's modes of control. These findings challenge harmful and rigid perceptions of incarcerated men in both literature and public discourse by highlighting their own writings. Additionally, the findings suggest that the development of programs that promote and encourage counter-hegemonic masculinity can potentially improve the lives of incarcerated men and contribute to their rehabilitation.

Introduction

"*Toughness is mandatory, brutality a virtue, as we resist — are forced to resist — the human urge for comfort*" [1]. – Cameron Terhune

What masculinity is expected in men's prisons? What masculinity is accepted in men's prisons? It is not a masculinity that manifests through portrayals of love and care, nor a masculinity that allows for tears and hugs. Outside of prison, men can perform masculinity by being tough and suppressing emotions, amassing wealth and showing off what money can buy, and providing for women and families. Inside, many of these outlets do not exist. Once incarcerated, an individual can no longer use material possessions, class, women, or families as signs that they are masculine; all they have is how they act and how they look. When left with only the power to control what emotions you show and how your body looks, the attention to emoting toughness through both is exacerbated. The norm of masculinity, then, becomes hypermasculinity. Discussions of this masculinity in men's prisons are extensive. Discussions of different types of masculinities that exist in men's prisons are not.

This paper will be looking at: *How does the subliminal employment of counter-hegemonic masculinity by incarcerated men resist the carceral system as a whole?* The goal of asking this question is, first, to understand prison masculinities that have been overlooked, and second, to analyze how the use of counter-hegemonic masculinities– those that are unexpected from incarcerated men by both their peers and the institutions that seek to control them– serve as a form of resistance to incarceration. This paper will detail accounts of typical hypermasculinity and explore how other forms operate alongside it. In existing literature, descriptions of non-hypermasculine performances are primarily limited to marginalized sub-populations, such as LGBTQ+ individuals, but are rarely discussed when it comes to the experiences of incarcerated men more generally.

The lack of safety, autonomy, medical resources, and care from prison staff reflects the structure of a system that, for over a century, has prioritized punishment over rehabilitation. The first section of this paper will include frameworks from the scholarly literatures on hegemonic masculinity, prison social norms and expectations, and emotional and hybrid masculinity. This is followed by an analysis of stories written by currently incarcerated men for the Prison Journalism Project, a non-profit organization that offers training to incarcerated writers and provides them with a platform to publish their work. These stories, though all connected to counter-hegemonic masculinity, are organized into subsections pertaining to staff reinforcement, puncturing the emotional veneer of masculinity, the complexity of caring and kindness, crossing racial barriers, and creatures that comfort.

This paper will argue that just as incarcerated men are not a monolith, neither are their performances of masculinity. Men resist the carceral system by employing types of masculinity that undermine the foundation of incarceration, which is control and dehumanization.

The following terminology will be used in this paper: *Hegemonic masculinity* refers to the dominant form of masculinity in a society, while *hypermasculinity* describes an exaggerated form of hegemonic masculinity. The term *carceral system* refers to institutions associated with punishment and control, including but not limited to prisons, jails, probation, and home confinement.

Masculinity Studies and Hegemonic Masculinity

Studies of women and femininity, which rose in quantity and prominence during second-wave feminism, led, in part, to the importance of studying masculinity. In the field of women's studies, it became increasingly apparent that in order to produce sociological works about women, men had to be studied too [2]. Though literature and history had been and continued to be dominated by male narratives, there had not yet been significant study about men as gendered selves [3]. The academic discipline of masculinity emerged in prominence during the late 1980s and early 1990s, which necessitated the creation of masculine-specific terms, constructs, and themes to describe the role of and relationships to masculinity in society [4].

Coined by R.W. Connell, hegemonic masculinity describes the "configuration of gender practice which embodies the currently accepted answer to the problem of the legitimacy of patriarchy, which guarantees the dominant position of men and the subordination of women" [5, p.77]. Adding "hegemonic" in front of masculinity implies that there is a subset or quality of masculinity that is consciously or unconsciously utilized to ensure the subjugation of women. Masculinity is not hegemonic in itself, but rather in its relations to women and other masculinities [6]. Men benefit from hegemonic masculinity, making it especially difficult to overcome or transgress [6].

The term "hegemonic masculinity" was initially constructed to analyze a practice, not an expectation or identity [4]. This practice allows the persistence of patriarchal systems, norms, and customs. Within masculine culture, hegemonic masculinity is the ideal and most socially accepted masculinity situationally and institutionally [2]. Though hegemonic masculinity does not align with how most men identify their own traits and practices, it does influence and inform all masculinity performances due to its historical and subsistent dominance [7].

The existence of hegemonic masculinity cannot be maintained without other types of masculinities. Though hegemonic masculinity is definitely normative, only a minority of men can employ it, and those who cannot have their masculinities informed by what hegemonic masculinity is not [4]. Social positioning in structures of race, class, sexuality, and gender creates power differentials between men. Only those with access to hegemonic masculinity through social structures can receive the rewards from patriarchy and dominance, though masculinities are easily subject to change [2], [4].

Prison Masculinity

Crime in the United States is predominantly committed by men and boys, and in 2018, men made up 93 percent of incarcerated individuals in the United States [2], [8]. Due to the lack of privileges and the need to avoid danger and vulnerability, incarcerated men are forced to present a hypermasculine front that lacks emotion and hides weakness [9]. Expressions of love, kindness, affection, sadness,

and care are deemed as weaknesses in prison, and are therefore rarely embraced, shared, or shown [10]. Hegemonic masculinity dominates society outside of prison and is only intensified and reinforced in the environment that has a focus on discipline and control [11], [12].

Though incarcerated men enter prison with their own type of masculinity and their positioning in society outside of prison, they are immediately confronted by a space that lacks all of what was prevalent in their lives prior to incarceration, whether that be family, meaningful relationships, work, community, or hobbies. The traditional resources for expressing hegemonic masculinity, like money, education, and relationships with women, are either non-existent or the social structure that positions certain individuals at the top of hierarchies are not organized in the same way as they are on the outside [11]. Faced with a new reality and entirely different environment, incarcerated men are forced to adapt quickly to the social rules and hierarchy of this society. In the short term, fear and sadness can be masked and partially relieved by exaggerated masculinity [10]. Prison masculinity, therefore, is a coping mechanism for men stripped of autonomy, family, privacy, affection, and meaningful work [10].

The persistence of hegemonic masculinity in prisons stems not only from incarcerated men to manage social status and safety, but also from the correctional employees who reinforce it. The significance of hypermasculinity among incarcerated men is evident in how correctional officers and wardens use masculinity as a tool for control, punishing inmates by designating jobs that are not deemed masculine and rewarding them with privileges such as outdoor time for physical exercise [13], [14]. The prevalence of exaggerated masculinity is so severe that activities that channel hypermasculinity into positive results are necessary to minimize aggression, dangerous altercations, and violence [10], [12].

New and Hybrid Masculinities?

Though hegemonic and hypermasculinity are by far the most utilized performances of masculinity in prisons, they are not the only type of masculinity present within the carceral system. As has been evident since the beginning of masculinity studies, new terms must be created when there are forms of masculinity that no longer fall under one label. One example of a new term is the concept of hybrid masculinities, which refers to types of masculinity that incorporate facets of subordinated masculinities and facets of femininities [15]. Adding a new construction of masculinity to the literature allows for research that does not cast the net of exaggerated masculinity onto all incarcerated individuals. Men in prison are not homogenous in their performances of masculinity, and it would be inappropriate to study masculinity in prison through the lens that it is all dangerous, unemotional, and unidimensional.

It is important to note that a massive limitation in the concept of hybrid masculinity is that it has mainly been studied and defined in relation to white, heterosexual men [16]. Due to this focus on men who are able to embrace masculinities that go against the norm without repercussions, it is not clear how men who do not have the same privileges employ hybrid masculinity. To expand the concept of hybrid masculinity to marginalized men, and in this case marginalized incarcerated men, Jamani Umamaheswar conducted a study with interviews that were meant to get at how men in prison view their masculinity and emotions. She finds that though these men feel that they must hide their traits and performances associated

with femininity to fit in with other incarcerated men, they believed that you must have emotional relationships to truly be "a man"—a view which would not typically fit into the definition of hegemonic or hypermasculine performances [13].

There are complex ways in which incarcerated men express their masculinity, and the performances that are not hypermasculine can equally inform the strategies that men use to adapt to and survive within the prison environment. Emotions cannot be suppressed all the time, as that would lead to constant violence and aggression, and does not allow for the forming of any relationships necessary to get through life in an environment that strips people of everything they had before entering the system [15]. Incarcerated men do not strictly conform to hegemonic masculinity but instead create variations to satisfy the need to be loving/loved and caring/cared for at least some of the time.

Method

This paper examines the role of counter-hegemonic masculinity in the everyday lives of men incarcerated in United States prisons, using writings produced within these institutions. While traditional sociological methods such as interviews, ethnographies, surveys, and case studies have been widely utilized in prison research, analyzing stories and opinions directly from incarcerated individuals offers a less common approach. To explore the narratives authored by incarcerated men, this study employs content analysis of 30 stories written by 27 men. Content analysis is a research method used to identify and evaluate the occurrence of words, themes, and/or concepts within qualitative data [17]. Unlike interviews, where the presence of an interviewer and selective interpretation of responses can influence outcomes, content analysis of these writings provides unmediated insights into the author's perspectives.

The Prison Journalism Project (PJP) was established in April of 2020 to provide journalism education to incarcerated people in an effort to make their experiences and opinions available to the outside world [18]. Their hope is that, through journalism, the writers for PJP can learn transferable skills, create meaningful change, and challenge "who speaks with authority about life in prison" [19]. Learning how to write effectively is extremely useful for incarcerated individuals as the majority do not have high school diplomas, and seventy percent read and write below a fourth-grade level, which only increases the difficulty of reentering society [20]. PJP hopes to increase transparency about the U.S. prison industry through those who know it best so that they have an opportunity to break stereotypes, shift the traditional narrative, and contribute directly to dialogue about criminal justice reform.

Limitations

The primary limitation of this paper is the number of stories analyzed. While 30 stories can provide valuable insights into life while incarcerated, they are not representative of the diverse experiences of incarcerated men. Vast differences in state versus federal prisons, variations across and within states, and distinctions among security levels make it challenging to generalize findings. Factors such as age, gender identity, sexuality, race, and religion can significantly affect the experiences of incarceration and influence how masculinity is expressed. Additionally, as a woman who has never been incarcerated, no amount of research would be enough to understand what it is like living in prison and how dynamics of masculinity and femininity truly play out.

Findings

The carceral system thrives when incarcerated men self-police. This self-policing relies on and is reinforced by hypermasculine performances, whether of emotional suppression, physical dominance, an individualist perspective, or an 'us versus them' mindset. When incarcerated men embody counter-hegemonic masculinity—expressing vulnerability, kindness and generosity, and community—they undermine and disrupt the self-policing that the system relies on for punishment, order, and control.

This section of the paper discusses how expressions of emotion, caring and kindness, crossing racial divides, and time spent with animals serve as forms of resistance. The analysis begins with three stories that feature examples of staff reinforcing a negative, hypermasculine atmosphere. The second section features five stories, there are eight in the third, six in the fourth, and eight in the fifth.

Staff Reinforcement

"*Why was I sent to prison again? Punishment? Justice? Rehabilitation? Or is it indoctrination into the same criminal belief system that got me here, reinforced over and over?*
But the prison keeps telling you that they are promoting positive change in my behavior" [21]. – David Jones

Placing people in positions of authority can promote aggression, objectification, and dehumanizing behavior [22]. Prison staff not only fail to deviate from this tendency, but are likely to exhibit these harmful behaviors to an even greater extent. In their jobs, they have power over individuals who are among the most excluded in society. The pervasive stigma around incarcerated men often amplifies the dehumanization they face, with the harsh exercise of power over them an accepted part of the system.

A tactic for control that was mentioned in quite a few stories are strip searches and cell searches. A common thread in these stories is humiliation. When correctional officers (COs) go cell by cell to search for contraband, at least at the institution that Frederick Dew is living in, they begin with strip searches. Afterwards, when you are left in just your t-shirt and boxers "the walk of shame ensues and the degradation commences" [23] as COs destroy the individual's cell under the pretext that there is something hidden. The men have to stand in a central location for up to three hours with no regard for taking medication or going to the restroom [23], [24]. Even if there is no contraband found, the COs leave the cells in complete disarray with belongings treated like "garbage," "your food opened, and containers taken away along with anything else the officers felt you should not have. It doesn't matter if it is an item you purchased from the facility's commissary or received in an approved package" [24]. Frederick says that this process and the feelings of violation that come from it can "lead to an environment of hostility and violence" [24]. It does not have to go this way. If prison staff and administration wanted to change the operation, or simply do it without cruelty, they could.

David Jones describes that the COs help create "the most toxic environment created by man" [21] which can, of course, do nothing to help rehabilitation. Directly contributing to the embodiment of hegemonic masculinity, the COs, in trying to demean the incarcerated men by poking at their masculinity, refer to them as the f-slur and "little princesses" [21]. Not only do they make homophobic and sexist remarks, but racist ones too. David describes

that the COs only feel comfortable speaking to the incarcerated men this way because the people above them are doing it too. He states that "this sentiment is so pervasive in the corrections officers' unspoken creed that any other sentiment would seem foreign" [21].

Puncturing the Emotional Veneer of Masculinity

"*..to hear someone cry out loud in prison is as rare as an eclipse or a leap year*" [25]. – Marcus "Wali" Henderson

As previous literature has demonstrated, the environment of men's prisons fosters hypermasculinity [10], [11], [12]. It does so because it was "built on injustice and violence, but not humanity" [25]. The writers of the stories used in this paper affirm this, as mentions of hostility, fear, anger, danger, and toxicity are overflowing in almost every story no matter the subject. Even so, emotion breaks through.

Crying is not a common occurrence in men's prisons. In agreement with the literature, the PJP authors say that crying is seen as a sign of weakness and can put an individual in danger. Though people do eventually cry, they do so in private to escape judgment. This does not mean that crying is never accepted though. When an individual finds out that someone's loved one has passed away, they are typically given space by the other men, with cellmates often leaving the cell for hours [25]. This space allows for an opportunity to cry without it being openly acknowledged, even though everyone is aware that it happened. So when someone cries publicly, responses are varied. There is shock, there is caring, and there is annoyance. After a young man publicly had a breakdown, Wali describes asking people who witnessed it how they felt about the occurrence. The common response was that the man was "soft," but Wali felt differently, expressing hope that the next "generation will continue to challenge the status quo, bringing a little humanity into the museum of false beliefs" [25].

In such a harsh and uncomfortable environment, it is especially difficult to mourn. Dennis Jefferson Jr.'s friend, Gerald, passed away when Covid-19 was devastating prisons. Gerald was the first person to offer the writer a seat in chow hall (where incarcerated people eat their meals), which was significant because it is a "hostile" environment, where the tables are segregated by race, among other characteristics [26]. Though actions like these might seem rather small, if the seats are reserved, or a table does not want you to sit with them, you have nowhere to sit. Dennis, in reflecting on Gerald's passing, is acutely aware of how much his friend meant to him and how much he hid this for the fear of appearing "soft, squishy, [and] emotional" [26]. He describes his discomfort and challenge in hiding his emotions, and attributes these feelings to

> The male role belief system, which pushes traits like stoicism, toughness, silence, and strength, tells us to be unemotional in our manhood. But I've found these traits self-destructive, limiting and disingenuous. These labels come with scripts and expectations, but they should come second to what's in the heart. These qualities have helped me in certain situations, but most have outlived their usefulness [26].

Many incarcerated men share similar experiences. Suppressing emotions has become so normalized in this environment that, when something deeply emotional occurs, individuals often struggle to react or cope effectively. The "mask" that conceals these emotions offers no benefit to their well-being. This is why, when faced with intense emotions, the ability to accept and understand them, as Wali and Dennis did, carries profound significance and strength.

Incarcerated men do not just puncture emotional veneers through crying about upsetting and tragic events. Being in prison deprives people of being allowed to openly feel joy too. When California began implementing free tablets that allowed for video calls, Walter Hart watched a man, who had been incarcerated for 12 years, find out that he would be able to see his grandma for the first time while in prison. It should not come as a surprise that people become hard and cold when they are put in a place that is allegedly for reform and rehabilitation, and some cannot even see or hear from their close family and friends for years. They are stripped of all the people and things that brought joy, love, care, and warmth, so toughness and hypermasculinity is all that they have left. When the man's grandmother answered the call "he had put up a valiant effort holding back his emotion, but within minutes tears began cascading down his face" [27].

When feelings of sadness and joy are barely accepted, physical touch is unheard of. While Biktor B was talking with a friend named Cuba, Cuba cracked a joke that made Biktor "laugh so hard that [he] impulsively gave him a slight hug, just for a second or two" [28]. Though, outside of prison, this would appear to be a completely normal and usual interaction, Cuba went silent. One of the biggest takeaways from these stories is that, in prison, all interactions and practices have to be relearned. Biktor feared that he was in danger or that Cuba was having a stroke until he said, "Biktor, I've been locked up for over 23 years, and this is the first time someone has ever hugged me" [28]. Biktor has hugged Cuba every time he has seen him since.

Crossing the Barriers of Racial Divides

"*These clippers ain't Black or White. They're just clippers, and if you got a problem with it, find somebody else to cut your hair*" [29]. – Walter Hart

Separations by race are especially prevalent in prisons for a variety of reasons, one of the most prominent being that an individual receives protection and support from the group of people they racially identify with. In some institutions, incarcerated people refer to these groupings by race as "cars." An example of which is the PISA car, which PJP defines as Latinos who are not affiliated with a gang, though different prisons have differing specifications [30]. Some are happy with the chosen car system as it brings a sense of belonging, but most are forced to deal with it because separating by race is how groupings in prison have always been created. Though segregation in prisons is technically optional, it was not always this way. In 1968, before the Supreme Court in *Lee v. Washington* ruled that segregation in prisons violates the Equal Protection Clause of the Fourteenth Amendment, all incarcerated individuals were formally separated by race [31]. California prisons, along with many others, only officially stopped 37 years later when the Court's ruling in *Johnson v. California* stated that racial segregation policies in prison must be strictly scrutinized [32]. It is not surprising then, that racial divides are cemented in prison culture.

In such an atmosphere, with a "take care of your own" mentality, what prevents racist violence? Though racism is

inescapable, "racist hate is spread evenly in California prisons in a way that may neutralize its violent charge," [33] so much so that in 26 years of incarceration, Kevin D. Sawyer has never witnessed someone being attacked because of racial animus. Kevin attributes this phenomenon to self-segregation, i.e., the cars. The key to the lack of racist violence is not fear or the toughness of the men one hates, but respect for each other. Joey LeBlanc is a self-described "former White supremacist" who learned to reject the behavior and beliefs he was taught that made him so hateful. Survival in prison is not dependent on who can be the most hypermasculine, but on learning to coexist. Kevin writes that even when an incarcerated man dons tattoos that are associated with the Nazi party, instead of fighting, you "read the tats, register the hate, know the man, give him space" [33].

When Walter Hart, the incarcerated barber for Black men, was tasked by a CO with helping an elderly White man, there was immediate confusion by him and those who witnessed the conversation. Gary, the 74 year old Walter was asked to assist, had just been beaten up because he smelled. He did not own soap, shower shoes, or deodorant, so could not shower. When receiving pushback from other men for agreeing to help, Walter responded that "these clippers ain't Black or White. They're just clippers, and if you got a problem with it, find somebody else to cut your hair" [29]. After giving Gary his own extra shower equipment so that he could get clean, Walter began cutting his hair. As he did, fellow incarcerated men began walking over and dropping off necessities for Gary on a table next to him. In the end, men of all different races, men who are believed to not help each other or care for each other, had gifted Gary clothing, soap, shoes, toiletries, food, and coffee, so much so that the table was overflowing. Items like these are not as easy to get inside of prison as they are outside. Men have to wait until their day to go to the commissary each week, every other week, or month, and then spend what little money they have (from family or friends on the outside or prison jobs that pay cents per hour) to purchase everyday necessities and anything else they can afford. The men who helped Gary, typically characterized as dangerous criminals that display only hypermasculine traits, gave up their goods for someone they had never met, someone who was not even "one of their own."

C.R. Addleman and Aaron M. Kinzer share similar sentiments. Aaron leads workout classes so that fellow incarcerated men can channel their energy into positive avenues and because bad health is prevalent in prisons stemming from the food and abhorrent healthcare. He finds that in the groups of men he works out with "topics of conversation range from amino acids to Freud, from water intake to war, from tendinitis to Tesla," while "brothers of all stripes, colors and creeds bond over bench presses" [34]. And when C.R. finds true friendship, he tells his friend that "no matter what the unwritten prison laws of the division of races says, all BS aside, you'll always be one of the few, if not the only, I consider my friend" [35]. These men resist the system through collectivity, respect, and trust in each other. They see humanity and complexity, instead of what prison staff and many outsiders see. To each other, even with pervasive levels of racism, they are more than inmates and more than criminals.

The Complexity of Caring and Kindness

"Over time, these men have become my prison family. I almost hate to place the word "prison" in front of "family," because the relationships I have built are genuinely familial, regardless of environment or circumstance" [36]. – Preston J.

In writing stories about caring and showing kindness towards each other, these authors present a narrative that resists the carceral system's justification for its punitive structures. When entering prison, an individual is stripped of everything they had and knew prior to entry. One of the biggest of these losses, according to Shon Pernice, is a sense of dignity. He says that

> When people are treated like a piece of trash every day for years, they internalize it. They begin to feel that they aren't worthy of love, support or time. If offenders are programmed to feel this way, then recidivism and other failures in rehabilitation and re-entry should come as no surprise [37].

This does not mean that no one is trying to combat feelings of worthlessness and the loss of respect and dignity, though it is certainly not the system doing so. Shon began a clothing donation program for newly released veterans, John L. Orr gave housewarming gifts to recently incarcerated men, Andrew Suh dropped everything to take care of an ailing 75-year-old man, and Lawrence May filled Christmas stockings for all the men in his building. These men are not the exception, combating hypermasculinity through kindness, they are just some of the ones that have written their stories.

When Shon's veteran friend was preparing for release, he tried to find a halfway house for veterans that had been incarcerated to ease his reentry into society [37]. He felt unequipped to return to society, and the prison system did not provide the resources or support needed to aid the transition. After being repeatedly declined due to his prescription for antidepressants, he finally found one that accepted him. When he called Shon after his release, he spoke of feeling embarrassed to walk into the reentry center as the prison had given him mismatched clothes that were too big for him. In resisting this lack of care, Shon felt that his friend's poor experience had given him a "mission and a purpose" and with that, found organizations outside of the prison that could help him gather clothing and other essentials to gift, in a "Bag of Hope," to recently released veterans.

John learned how "what goes around, comes around" could be "applied to the spirit of giving" [38] when two men he had once helped returned the favor years later and at different prisons. One had received kits of snacks, coffee, and essentials from John until he was able to afford them himself, and the other was supported while struggling to adapt to his new life in prison. Preston J. writes about how his prison family, made up of men who "gave me a job when I was lost, corrected me when I was mistaken, cooked for me when I was hungry, expressed pride in my growth when earned" [36] helped him develop since entering prison at 18. These men give him "hope for a better future," when the institution does not. And when Andrew noticed an elderly Korean man who did not speak any English enter the prison, he spoke to him in Hangul, smuggled him some clothing and snacks, pulled strings to get him moved into the cell Andrew was in so that he could take care of him and be his interpreter, cooked for him, cleaned for him, and loved him. When the "petite 75-year-old Korean man was thrown into the American criminal justice system to fend for himself," [39] with declining health and no way to get proper medical assistance, Andrew acted as

his nurse until the man was released. After all of that, Andrew said the man had helped him most, healing his traumatic past, and being the father that he needed in prison.

The Holidays

The consensus is that the holiday season is pretty depressing when you are incarcerated. All the comforts of the holidays do not naturally exist in prison, but that does not mean that people do not try to reproduce at least some of them on the inside. In Reginald Stephen's prison, two men made a Thanksgiving meal consisting of turkey, yams, collard greens with pepperoni, macaroni and cheese, and fresh broccoli. While eating, the men experienced, "for a little while, a sense of brotherhood, goodwill and community" [40]. During Christmastime in the prison Walter Hart is incarcerated in, a man strung up homemade Christmas lights, made a cardboard tree decorated with bulbs made from Doritos bag foil and fake presents to go under it, and created a fake fireplace with aluminum foil and an amber light. Another bought ramen and coffee for everyone, contributing to "a genuine feeling of brotherhood that sometimes gets lost in the shuffle of daily prison life" [41].

On his 13th Christmas in prison, Brian Hindson watched a man secretly leave a Little Debbie snack on every person's locker, each with a bow made of green and red string and a note that said, "Merry Christmas" [42]. On the same day, he watched one of the cars gather items from the commissary and give them to a man from a different car because he "had no money coming in and could use some goodwill" [42]. In changing the narrative on what men's prisons are like, Brian writes that these people give him hope because "humanity, kindness, well-wishing and the like all exist here" [42]. Similarly in an act of generosity, Lawrence and his friend filled stockings (state-issued socks) with shower shoes, "a soda, a bag of nuts, a Rice Krispy Treat, a pastry, hard candy and a variety of dark and milk chocolates" [43]. Lawrence found that this "simple act of love had a deep effect on these restless and homesick men," [43] and that his and his friend's "acts of kindness and compassion may have helped others, but they also changed our lives forever" [43].

Brotherhood and generosity do not come naturally to life in prison. The harsh environment created for punishment, which thrives on anger and fear through self-policing, should not also have men who make decorations, food for each other, and give out gifts. But it does. With community, the prison cannot easily control incarcerated men, and without it, the prison cannot easily rehabilitate them.

Creatures that Comfort

"*Perhaps prison would have persisted this way forever. Perhaps our granite hearts and iron wills would have never crumbled. Perhaps the prison mentality, that we be cold and heartless, would have endured. Perhaps. But then there were kittens*" [1]. – Cameron Terhune

Paws For Life K9 Rescue, New Leash on Life, Everglades Dog Program, and Paws with a Cause have all partnered with prisons to have incarcerated men train dogs for various purposes, including providing assistance for people with physical disabilities and being service dogs for people with PTSD. Those participating in dog programs contrast the stigma that incarcerated men do not show care and love. Richard Fontes, along with others who write about similar programs, sees parallels between the dogs and incarcerated men. The dogs thrive in their training and rehabilitation when they receive positive reinforcement, affection, and patience, and when they feel "safe and loved" [44], [45], [46], [47]. This is exemplified when one man, "inspired by empathy for his dog's scars, shared how he, too, was abused. Tears streamed down his face. He accepted a hug from a man whose hand he might not have even shaken before" [44].

Another commonality in these stories is that the dogs give the men purpose when they otherwise feel worthless. Training dogs changed Timothy's "formerly arid life," [45] as he no longer feels that he must wait until his release from prison to have a purpose. His dog, Waylon, gave him a second chance at a happy life. The love Waylon showed him encouraged him to "try to change not only the prison culture, but society" [45]. Before being partnered with a dog, Bradford King was "going through the motions and wanting to die" [46]. He found purpose in challenging himself and others to show affection, and when asked by another incarcerated man why he kisses his dog, he responds, "because I want him to know that I love him... The greatest strength is gentleness" [46]. Eric Finley did not feel human until a puppy came up to him, her "eyes shining with life, unlike so many human eyes here in prison," which he describes as "the most thrilling interaction I had experienced in years" [48]. Lawrence looked forward to getting up in the morning just to train his dog, Casper [47]. J.H. writes that the dogs help the incarcerated men let down their walls and feel vulnerable, with one man teaching his dog the command "hugs and kisses" [49].

And Kittens

Though less common because there are no programs related to them, kittens still find a way to make it into incarcerated men's lives. When the incarcerated men at Jesse Milo's prison felt worthless, a "shower of meows seems to validate our existence, letting us know we are fulfilling some purpose in this world where many of us are forgotten and sent to die" [50]. For these men, purpose came in the form of sneaking food from the chow hall and the commissary, risking punishment during pat-downs after meals just to feed cats that had made the corner of the prison yard their home. The cats make the incarcerated men feel alive again, with Cameron writing that they are "gracious enough to spend their time with us so that we might learn, and so that we can enjoy a few quiet moments of warmth, softness, non judgment, and freedom" [1].

A feeling of worthlessness and dehumanization permeates the carceral system. The dogs and cats "reject everything it means to be in prison," making "hard cases doing hard time melt like butter" [1]. These men should not need animals to feel that they have a reason to live, but they do. The animals contribute to resistance, allowing the men to show love and affection, to be "soft and cuddly" [1], to feel joy.

Lessons Learned from Incarcerated Men

The subliminal employment of counter-hegemonic masculinity by incarcerated men resists the carceral system by challenging the dehumanizing norms perpetuated by the prison environment. The men in this paper reclaim their stripped humanity, demonstrating that power comes less from masculinity and more from embracing emotion, fostering community, supporting each other, and expressing affection. Being hypermasculine confirms and reinforces what the public already believes about incarcerated men. If there is no outward evidence of love and kindness, society will continue to view incarcerated men as undeserving of these qualities. Through

these stories for PJP, incarcerated men can literally rewrite the narrative, challenging harmful preconceptions.

At the time of writing this paper, there is a noticeable gap in scholarly work addressing counter-hegemonic masculinity in prison. While studies on hegemonic and hypermasculinity in prisons are valuable, the lack of recognition for other forms of masculinity perpetuates harmful stereotypes and stigma. The flaws in the United States carceral system are evident, and the academic literature and discourse surrounding it should strive for more complexity and nuance.

There are numerous opportunities for future research, particularly in incorporating and amplifying more voices and perspectives from individuals within the system. Further exploration of the intersectionality between race, age, sexual orientation, religion, and gender and prison masculinities is necessary. Additionally, understanding and developing programs that promote and encourage counter-hegemonic masculinity can potentially improve the lives of incarcerated men and contribute to their rehabilitation. By fostering emotional expression, community building, and empathy, these programs can challenge harmful gender norms and toxicity, and support reintegration into society.

The carceral system cannot be changed without listening to those inside it.

Appendix A: The Men

This section gives all of the names and locations of incarceration for the writers mentioned in this paper. Some of the men have short bios on their profiles which are included. It is important to continuously acknowledge that these authors deserve respect and recognition, particularly given the negative stigma associated with incarceration.

In order of appearance:

David Jones in Texas– "David Jones is a writer and the author of *Living in Reality: Everything I Needed to Know I Learned in Prison*."

Frederick Dew in California

Kenneth M. Key in Illinois

Marcus "Wali" Henderson in California– "Marcus 'Wali' Henderson is the former editor-in-chief of San Quentin News, an award-winning newspaper published out of San Quentin State Prison in California, where he is incarcerated. He became a reporter the day he arrived at San Quentin."

Dennis Jefferson Jr. in California– "Dennis Jefferson Jr. doesn't think of himself as a writer, but one who respects the power of words. He participates in charity drives, volunteer work and self-help groups, and he holds an associate degree in general studies."

Lanard H. in Wisconsin

Walter Hart in California

Biktor B. in California– He writes under a pen name.

Kevin D. Sawyer in California– "Kevin D. Sawyer is a contributing editor for PJP; a member of the Society of Professional Journalists; and a former associate editor and member of the San Quentin News team that won SPJ's 2014 James Madison Freedom of Information Award. His work has appeared in the San Francisco Chronicle, Oakland Post, California Prison Focus and others. He was a 2019 PEN American Honorable Mention in nonfiction and a 2016 recipient of The James Aronson Award for community journalism. Prior to incarceration, Sawyer worked in the telecommunications industry for 14 years."

Joey LeBlanc in California

C.R. Addleman in California

Aaron M. Kinzer in Pennsylvania– "Aaron M. Kinzer is a writer, poet and spoken word performance artist. His work has been published in the Columbia Journal and In the Belly, the upcoming re-sentencing journal by Tufts University. He has written for DreamCorps Justice for their 2022 National Day of Empathy."

Shon Pernice was in Missouri– "Shon Pernice is a contributing writer for PJP. He is a veteran and a Kansas City native who served in Operation Iraqi Freedom as a combat medic and came home with traumatic brain injury and PTSD. He has been published in Veterans Voices, The Beat Within and Military Magazine. He is a contributing author to the book, *Helping Ourselves By Helping Others: An Incarcerated Men's Survival Guide*."

John L. Orr in California

Preston J. in Pennsylvania

Andrew Suh in Illinois

Lawrence May in California– "Lawrence May is a writer incarcerated in California. He has traveled to nearly 40 countries outside the U.S. and has written more than 50 stories, as well as his autobiography."

Reginald Stephen in New York

Brian Hindson in Texas– "Brian Hindson is an artist whose favorite styles of work are impressionism and pop art. His work is published on the Justice Arts Coalition."

Cameron Terhune in California

Richard Fontes in California– "Richard Fontes is a writer who once served in the U.S. Army. For several years now, he has been involved with Paws For Life K9 Rescue"

Timothy Johnson in North Carolina– "Timothy Johnson is the assistant editor for The Nash News, a newspaper published out of Nash Correctional Institution in North Carolina, where he is incarcerated. He holds a bachelor's degree in pastoral ministry with a minor in counseling from Southeast Baptist Theological Seminary. He also works as a graduate assistant and is the editor of the journal Ambassadors in Exile for The College at Southeastern's North Carolina Field Minister Program (NCFMP), which provides theological training to long-term incarcerated people."

Bradford King in Michigan

Eric Finley in Florida

J.H. in Florida– "J.H. is a writer incarcerated in Florida. His high school literature teacher published his first poem in a journal for Seminole County. Nearly 30 years later, Ms. Susanna, an instructor for Exchange for Change's creative writing course, encouraged him to pick up writing again. Now in his 50s, he finds the possibility of realizing his dream to be a writer uplifting. He has asked that his full name be withheld."

Jessie Milo in California– "Jessie Milo is a writer, artist and poet incarcerated in California. He is a volunteer for InitiateJustice.org and an advocate for mental health."

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Resisting Homogenisation and Recognising Power Dynamics: An Intersectional and Decolonial Approach to Discussing the Marginalisation of Disabled Women in 'Low-Income' Countries

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Within the related fields of international development, sociology and social policy, the contention that disabled women in low-income countries (LICs) are the most marginalised demographic is extremely common and widely accepted. This is with good reason, yet the inclusion of intersectional and decolonial approaches within the related literature is surprisingly sparse. Instead, discussions often overgeneralise disabled women as a homogenous group in LICs, failing to recognise other aspects of identity, differing impairments, and therefore different experiences and barriers. This paper discusses and analyses the nuances behind these discussions, challenging the generalisation of disabled women as a monolith in LICs within the related literature. It also subsequently confronts the questionable use of the term 'low-income' itself, as commonly used in the literature and related debates, due to the power dynamics and history behind it. This paper firstly introduces key context and relevant terminology, before discussing the importance of recognising other aspects of identity, such as socioeconomic status, citizenship status, and sexuality in addressing the marginalisation of disabled women. It also discusses the importance of intersectional and, towards the end of the paper, decolonial approaches when exploring disability, including the contextual history and emergence of countries as low-income. Lastly, considering the above, this paper provides recommendations on how to best address the marginalisation of disabled women in low-income countries.

Introduction

Approximately 80% of the world's disabled population are reported to live within the 'Global South' (World Health Organization, 2023), which is also where most low income countries (LICs) are situated. This is partially explained by a related cyclic link between poverty and impairment, resulting in disablement (See for example, Joseph Rowntree Foundation, 2022). This is also often perpetuated due to social exclusion enforced by conflict and a lack of corresponding funds and services for disabled people, resulting in either a lack of support for existing impairments or the creation of new ones (Parnes et al, 2009; Banks et al., 2017). Three quarters of disabled people within the 'Global South' region are women (United Nations, 2017). Importantly, "disability is not a gender-neutral experience" (CBM, 2019, p. 4), and it is undeniable that empirically and statistically disabled women in LICs are extremely marginalised. Disabled women are consistently reported to be the most disadvantaged - in comparison to disabled men - due to differing experiences of community and health services, law enforcement and employment, gender based violence, and education (Human Rights Watch

(HRW), 2012; CBM, 2018; Naami, 2015). Consequently, international organisations consistently and importantly convey the need to address this two-fold discrimination related to being a woman and disabled via humanitarian programmes, yet often fail to adopt further sufficient intersectional - and decolonial - approaches. At the time of writing - in 2023 - related discussions, perspectives, and literature often generalise disabled women as a homogenous group in LICs, failing to recognise other aspects of identity, differing impairments, and therefore different experiences and barriers. This paper assesses the common contention that 'disabled women in low income countries are one of the most marginalised groups in the world', arguing that nuances and context behind this overly simplified perspective must be discussed and recognised for marginalisation to be sufficiently addressed.

To argue the above points, this paper firstly examines socioeconomic status, sexual identity and citizenship status in relation to disability and marginalisation to highlight the importance of recognising other aspects of identity alongside disability. These aspects of identity are not intended to be an exhaustive list, but are

instead used to highlight the cruciality of an intersectional approach in related discussions. This leads to discussions of the necessity of recognising the range of different impairments and differences in how they are culturally conceptualised as a foundation to tackle the marginalisation of disabled women. This paper then points to a need for intersectionality and decolonial approaches when considering related power dynamics within the international development field, exploring the construction and definition of a 'low-income country' and colonial discourse as stimulants of the enforcement of marginalisation and hierarchical relations. Lastly, considering the above, this paper will outline two recommendations for addressing marginalisation for all disabled women in such countries.

Terminology & Key Concepts

When considering marginalisation, language can be a powerful stimulant; it is therefore deeply important to define key terms, although definitions of low-income countries are examined in more depth in the final section. When referring to 'disabled women', this paper is referring to women with impairments who are dis-abled by implicit and explicit societal barriers as partially in line with the social model as developed by Oliver (2004; 2013; 1996). However, this paper does not fully accept the social model due to its propensity to ignore discussions of differing impairments and their role in disability. In contrast, this paper defines impairments as relating to "the functional limitation within the individual caused by physical, mental or sensory impairment" (Disabled Peoples International, quoted in Oliver, 2013, p.4). Marginalisation, originally coined by Robert Park (1928), generally refers to individuals who are often excluded in various ways from 'mainstream' society, as their needs are ignored and pushed to the periphery away from the 'centre' (Robards et al, 2020). Intersectionality, as key throughout this paper, was coined by Crenshaw (1991), who stated that the examination of different aspects of identity was necessary in "mediating the tension between assertions of multiple identity and the ongoing necessity of group politics" (p. 1296). Intersectionality therefore recognises that multiple barriers relating to intersecting aspects of identity can result in a combined higher level of experienced discrimination, in comparison to when discrimination is experienced as based on a singular aspect of identity (Crenshaw, 1991). This paper also discusses the importance of a decolonial approach towards the end of this paper. This refers to the need to challenge and dismantle the ongoing effects of colonial processes, including relating to knowledge, institutions and systems tailored to the hegemony of the 'West'. An intersectional and decolonial approach is vital for the exploration of the simplistic perspective that this paper addresses.

The Importance of Recognising Identity as Multifaceted: Socio-economic Status, Sexuality, and Citizenship Status

As powerfully argued by prominent professor Erevelles (2011), disability should be "the ideological linchpin utilized to (re)constitute social difference along the axes of race, gender, and sexuality in a dialectical relationship to the economic/social relations produced within the historical context of transnational capitalism" (p.6). Whilst this paper examines the latter part of the quote in upcoming sections, socio-economic status and class are therefore evidently foundational to explore within intersectional approaches. The quote also portrays that class is imperative to explore regarding discussions of differing economies, as inherently linked to

constructions of disability in societal contexts.

Whilst sufficient intersectional studies on experiences of marginalisation regarding differing socioeconomic status and disability within low-income countries are severely limited, the importance of this is particularly highlighted via other relevant research related to countries such as Uganda. For instance, Vorhölter's (2019) seminal work showed that mental health services in the capital, Kampala, were mainly catered to and accessed by upper middle class individuals, arguably portraying differing levels of ability to provide support based on socioeconomic status. This suggests that multiple aspects of identity alongside gender must be considered when considering how to challenge barriers causing marginalisation, such as access to healthcare, in various societies.

Moreover, Okello (2023) has pointed to the fact that both individual and community based aspects are imperative to consider regarding healthcare use and accessibility, finding that utilisation "was uneven for people of different communities and social class" (p.1). When considering that gender is a key indicator of the likelihood of unemployment and less educational opportunities in Uganda (United Nations Women, c2023b; Odaga, 2020), this must be explored together when assessing levels of marginalisation, as disabled women will not all experience the same level of marginalisation due to differing socioeconomic status. Therefore, intersectional nuances must be highlighted in relation to the overarching contention that this paper addresses.

Analysis of other key aspects of identity, such as sexuality, are also vital to recognise when exploring the different needs of disabled women and related marginalisation. In general, as highlighted by an extensive review from Carew et al (2017), sexuality and disability in the context of low and middle income countries are not extensively studied, perhaps related to the trend of anti-LGBTQIA+ legislation within some of these countries hindering research - a trend which is also worryingly and increasingly present across multiple countries around the world. In contrast, experiences of sexuality and gender based discrimination is more widely researched in middle and upper income countries (Pike et al, 2023). This is despite the fact that levels of economic development and inclusion of LGB individuals have been found to be mutually reinforcing, where higher levels of economic development positively correlate with wider sexuality based inclusion (Badgett et al, 2019), supporting Erevelles' (2011) above quote. Yet, organisations such as Human Rights Watch (2021a) have reported that sexual orientation based marginalisation is deeply common in countries such as Afghanistan, Uganda, Sierra Leone and Sudan. Whilst countries such as Uganda must be recognised in its previous developments in increasing female representation and empowerment in addition to furthering disability protection via policy and legislation (Abimanyi-Ochom & Mannan, 2014), this contrasts with the country also recently upholding further marginalising bills targeted towards those who are not heterosexual. This has included the enforcement and development of the 2023 Anti-Homosexuality Act, which has been linked to human rights violations and extreme violence (HRW, 2021b). In this context, addressing the marginalisation of disabled women whilst ignoring other aspects of identity and subsequent discriminatory barriers has the power to entrench other forms of oppression. Therefore, to generalise that 'disabled women in low income countries are one of the most marginalised groups in the world' without recognition of further nuances within such discussions is deeply misinformed and

damaging.

Another key intersection relates to forced displacement and citizenship status, as low - and middle income - countries hold 74% of the world's refugees (UNHCR, 2022). At the time of writing, discussions around the marginalisation of disabled women in LICs often fail to recognise that disabled women in low income countries do not experience the same levels of protection and social inclusion, as these also differ depending on citizenship status. As highlighted by the foundational work of Morris (2005), participation in civil society for disabled citizens is already limited via social exclusion; research conducted in countries such as Sierra Leone have corroborated this, stating that lack of assistive technology is a key barrier (Austin et al, 2021). This also includes limited labour market access, which is relatively more extreme in low-income countries for disabled people and women (International Labour Organisation (ILO), 2019; ILO, 2023). This is evidently magnified, and three-fold for disabled people who have been forcibly displaced, and who do not have citizenship status in the relevant country, yet research on this in relation to low-income countries is currently limited.

Differing Impairments & and the Influence of Culture

An intersectional approach highlighting the importance of recognising different aspects of identity also relates to the necessity of recognising different impairments and their effects on the marginalisation of disabled women. Within the common perspective that this paper explores and provides nuance to, the implication is arguably that all disabled women in low income countries have the same impairments, or that differing impairments are not important. As powerfully asserted by Anastasiou & Kauffman (2013) on the homogenisation of impairments, "not all differences are created equal, and social justice is not found in responding to all differences as if they were equal, as if the remedy for one were surely the remedy for the other" (p. 446). In relation to low-income countries such as Sierra Leone, different impairments involve varying levels of stigma. For instance, mental health impairments are deeply stigmatised with poor governmental funding for treatment (Harris et al, 2020), whilst physical impairments such as amputation can involve complex notions of empowerment, symbolic history, and therefore relatively more support (Berghs, 2007). This is also particularly important to explore contextually regarding overlapping identities, which is exemplified by recent research relating to Afghanistan, where the United Nations have declared grave concerns for women's rights since the Taliban takeover in 2021 (OHCHR, 2023). Nasiri et al 's (2023) research has shown that certain demographics were more likely to experience impairments, such as those who were non-Pashtun, had lower levels of formal education, or were living in rural areas. Whilst surprising that Nasiri et al (2023) does not discuss the intersections between these and gender, they found that those with impairments related to cognition and communication experienced more difficulties or social barriers to political participation compared to those with other types of impairments. They also found that those with impairments relating to 'self care and life activities' experienced barriers to hospital care the most. Whilst Nasiri et al. (2023) do not define the specific impairments, instead categorising them into general themes, their research highlights the importance of an intersectional approach and recognition of differing experiences of marginalisation in relation to different impairments in low income countries.

When considering impairment, it is also necessary to examine culture as a factor in its conceptualisation, which can have a further impact on experienced marginalisation. An intersectional approach involving attention to cultural identity, which often overlaps with perceptions of the family (Rohwerder, 2018), is paramount to address marginalisation of disabled women in low-income countries effectively. Whilst there is a tendency to overgeneralise and suggest all impairments result in disability and thus marginalisation and stigma, it is important to emphasise culturally varying (and individual) attitudes to impairment. This was highlighted by Rohwerder's (2018) extensive review on attitudes and stigma of disability. For instance, she points out that in Tanzania, which at the time of their research was a low income country, the Chagga people view those with physical impairments as alleviators from harmful spirits (Mostert, 2016). As prolific filmmaker and photographer Phil Borges (2013) has also alluded to, the perception that all 'non-Western' countries have a damaging view of impairment is misinformed as this is often linked to different perceptions of spirituality, and this type of discourse must thus contain more nuance. Therefore, when analysing who is most marginalised in low-income countries as a foundation to challenging marginalisation, culturally differing perceptions must be explored. Moreover, when tackling the marginalisation of disabled women in low-income countries it is imperative to adopt an intersectional approach in relation to both spirituality or religious identity, in addition to recognising beliefs within the culture itself.

Marginalisation & 'Low-Income'

When discussing dominant and overly generalised perceptions of the marginalisation of disabled women in LICs, underlying discourses must also be examined. Here, comprehensive and contextual intersectional and decolonial approaches must be applied to recognise power dynamics involved in such marginalisation. As previously critiqued by Grech & Soldatic (2017), intersectional and postcolonial approaches often fail to include discussions of disability as a potential aspect of identity. However, the need to examine related contexts was partially highlighted by the work of Erevelles (2011) within disability studies, as also referred to above, who stated that intersectional processes often function within "[...] a dialectical relationship to the economic/social relations produced within the historical context of transnational capitalism" (p.6). Transnational capitalism refers to "the sum of all the relations between economic agents" (Southerton, 2011, no pagination), which operates in a global economy that is underpinned by colonialism (Bhambra, 2020). Writing within the post structuralist tradition, Erevelles (2011) also highlighted the powerful effect of language and history. Regarding the contention that this paper explores, the use of the classification and terminology of 'low-income' - in addition to the discourse that surrounds it - is deeply harmful when considering means to address the marginalisation of disabled women. It enforces perceptions of hierarchy and asymmetrical power relations. Using the words of Khan et al. (2022), "the practice and vocabulary of global health and global development today have their origins in racism and colonialism, which has created a false hierarchy among nations" (p.1). Khan et al (2022) also rightly point out that organisations such as the World Bank, who created the classification of 'low-income' countries based on Gross National Income per capita, have perpetuated this hierarchy by enforcing loans such as the Structural Adjustment Programmes in conjunction with the

International Monetary Fund. Moreover, as stimulated by these underlying power dynamics, utilising 'low income countries' as a blanket term also fails to recognise differing experiences of marginalisation in each individual country, enforcing both implicit and explicit overgeneralizations. Terminology such as 'low-income country' in addition to other terminology such as 'Global North' and 'Global South' are stimulated by colonialist beliefs as perpetuated by the perceptions that Edward Said (1985) warned against, creating a perceived underdeveloped 'other'. An intersectional approach, emphasising a dissection of both micro and macro power dynamics and different layers of oppression, in conjunction with a decolonial approach, must therefore be adopted. The above effects and discourse must be recognised and challenged when exploring the marginalisation and oppression of disabled women in low income countries.

Conforming to the above type of discourse also upholds the hegemony of the 'Global North' whilst decreasing the accountability of related countries (Grech & Soldatic, 2017), instead portraying 'Global North' countries as primary and foundational agents in enforcing means of reducing marginalisation for disabled women. This potentially adds to the general theme of continued control over 'Global South' bodies as highlighted by Grech & Soldatic (2017). Empirically, this is emphasised by Haqpana & Tsouroufli (2023), who have critiqued some INGOs for a lack of consideration in the roll out of some educational programmes in Afghanistan, arguing that they implicitly reproduce colonial discourses, and thus potentially enforce forms of marginalisation. Means to address marginalisation of disabled women within low income countries must therefore examine the roots of marginalisation and existing means used in order to tackle it.

This type of discourse rooted in colonial history continues to enforce the marginalisation of specific groups of disabled women, again enforcing the need for intersectional approaches in multiple contexts. This again relates to citizenship as an aspect of identity, as also mentioned in previous sections. This is exemplified by Ferris (2007), who has highlighted how food insecurity - often an ongoing consequence of colonial history (Bjornlund et al, 2022) - has been a factor in the abuse of power by some humanitarian organisations in refugee camps. More recent research has shown that this has continued, and can include sexual exchanges for food, in addition to sexual assault (Rohwerder, 2022). Considering disabled people are sexually assaulted "at nearly three times the rate of people without disabilities" (Disability Justice, c2023, no pagination), not examining and challenging hierarchical power dynamics in an intersectional manner when tackling and exploring marginalisation of disabled women is deeply misinformed and damaging.

Recommendations

As highlighted by the above sections, any methods to target the marginalisation of disabled women in low-income countries must adopt an intersectional and decolonial approach. Alongside general recommendations made regarding approaches throughout this paper, this section highlights two specific measures.

Firstly, NGOs and INGOs can sometimes be a barrier to preventing marginalisation, as seen in previous sections. To prevent issues outlined by those such as Haqpana & Tsouroufli (2023) in the previous points, any interventions or programmes must be organised and run either with or ideally by the local community where possible. They should also at the very least involve local disabled

women in programme delivery and during decision-making processes. As highlighted by Niewohner et al (2020), a key obstacle to tackling the marginalisation of disabled people for organisations is the lack of representation of staff who are also disabled. Employment processes must therefore adopt an intersectional approach for this to translate to effective, intersectional change. However, this must be cautious around positive discrimination methods, as its adoption is highly debated and may still enforce marginalisation. Importantly, Niewohner et al (2020) highlights four key themes that NGOs should focus on to overcome issues in preventing marginalisation: lack of awareness, lack of intersectionality thus placing disability as a separate focus, preconceived ideas that inclusion costs are too high and lastly the perception that responsibility should be devolved to others outside of the NGO, such as governments. These should be considered specifically in each differing local context, to prevent overgeneralized methods to tackle marginalisation. Any consequent funding in place by 'Global North' organisations to support local organisations must have zero conditions, and must not be in the form of a loan, to avoid entrenching existing power dynamics. Overall, these methods could begin to help the marginalisation of disabled women in low income countries more effectively.

Secondly, the above must be strengthened by international law and policy, which protects all disabled women in all countries. Currently, despite its many positives, the Convention on the Rights of Persons with Disabilities (CRPD) does not adequately provide protection for all disabled women. At the time of writing, there is an ongoing debate regarding whether the CRPD is applicable or intended for disabled asylum seekers (European Database of Asylum Law, 2017). It is also difficult to enforce internationally in some cases (Stolman, 2019). To bolster policy and legislation, Mijatović (2022) points out that, again, disabled women themselves must be more included in decision making processes, not only at NGO policy level but also regarding international legislation to prevent social invisibility. To fully target the marginalisation of disabled women in LICs, in conjunction with the previous recommendation, international and domestic law and policy must be strengthened and explicit articles protecting different groups of disabled women must also be incorporated, therefore recognising the importance of intersectionality. This must occur via the inclusion of, and collaboration with, local disabled women to interrupt any existing power dynamics.

Conclusion

Overall, this paper has explored the contention that disabled women in low-income countries are one of the most marginalised groups in the world, highlighting the need to discuss further nuances and context behind this often overly simplified perspective. In particular, it argued that related discussions often generalise disabled women as a homogenous group in LICs, failing to recognise other aspects of identity, differing impairments, and therefore different experiences and barriers. This paper has argued that the recognition of these aspects, historical context, and power dynamics within related discussions using an intersectional and decolonial approach is imperative for such marginalisation to be sufficiently addressed. It has argued that overall, whilst it is evident that disabled women in low-income countries experience extremely high levels of marginalisation, experiences of marginalisation are not the same across individuals and countries. This paper initially emphasised the need to examine and recognise the multifaceted nature of identity,

pointing to analysis of socioeconomic status, sexuality and citizenship status to examine varying experiences of marginalisation. It then highlighted the importance of analysis of differing types of impairment as also relating to different cultural attitudes, before emphasising the colonialist aspect and power dynamics behind terminology such as 'low-income countries' and 'Global South'. Lastly, although general recommendations and approaches on how to tackle marginalisation were made throughout, this paper highlighted two specific recommendations to further address marginalisation of disabled women in low-income countries whilst incorporating intersectional and decolonial approaches.

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You Are What You Eat: Chinese Ethnic Restauration in Paris as Identity Work

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This study investigates the role of French-born Chinese restaurateurs in Paris as arbiters of identity who are redefining the cultural significance of Chinese cuisine for a predominantly non-Chinese clientele. Utilizing semi-structured interviews, the field study delves into how these ethnic entrepreneurs utilize their culinary concepts as a platform for cultural identity negotiation and challenging dominant cultural narratives. The primary research question(s) explored are: How do these restaurateurs use their mercantile and culinary strategies to stage diasporic identity and influence sociocultural dynamics? To what extent does internalization of dominant tastes (habitus) influence their staging of identity versus more pragmatic principles of instrumental rationality? The findings reveal that dining and food consumption extend beyond mere social activities to become venues for complex cultural negotiations, where ethnic entrepreneurs challenge and navigate cultural hegemonies and identity formation processes. The study underscores the nuanced role of ethnic cuisine in altering cultural perceptions and power dynamics within a multicultural urban context. This research suggests further comparative analysis across different diasporic communities and direct engagement with consumers and industry stakeholders to enrich understanding of the broader sociocultural implications of ethnic culinary entrepreneurship.

Introduction: Cultural Staging and Entrepreneurship within Diasporic Culinary Institutions

Taste is often understood primarily as a matter of personal preference or physiological stimulus. In reality, taste is not epistemologically neutral; it is profoundly shaped by an individual's unique socialization, or the processes by which they have interpellated, internalized, and reappropriated the norms, values, behaviors, and preferences of a group. Likewise, what an individual perceives as tasteful or distasteful wields social meaning (Janes, 2014; Hojlund, 2015). The act of tasting is far from passive. Eaters are engaged in the reflexive activity of assigning meaning and value to their tasting experience based on their sociocultural conditioning. While physiological responses to certain foods do influence tastes, debating nature versus nurture in regard to acquiring certain tastes obscures questions concerning the social function of taste in demarcating and perpetuating sociocultural perceptions and distinctions. Moreover, taste is not static. Rather, it has the capacity to continually evolve based on exposure, new associations, and cultural learning (O'Brien and Ianni, 2022). In this context, taste can be understood not merely as a sensory preference but as socially meaningful qualia tethered to an individual's identity and position within cultural hierarchies.

This paper seeks to investigate how ethnic culinary entrepreneurs participate in the symbolic staging of Chinese culture to the French public through their restaurant concepts. Specifically, it aims to understand what approaches French-born Chinese restaurateurs in Paris employ in order to redefine the cultural meaning of Chinese cuisine and enhance its popularity among non-Chinese audiences. In what ways does their distinct socialization as "third culture" individuals dictate how they curate, perform, and commercialize their cultural identity?

I argue that these ethnic entrepreneurs function as key cultural intermediaries who strategically reshape public narratives around Chinese cuisine by actively reconfiguring how Chinese culture is represented, understood, and consumed among the French public and within the French cultural imagination. Their restaurant concepts, I contend, are not only sites of consumption but stages wherein cultural identity is continuously negotiated and reimagined. As such, analyzing their decisions as entrepreneurs through the traditional lens of instrumental rationality and profitability is insufficient.

To situate my argument, I start by understanding France's world-renowned, long-standing gastronomic tradition. Gastronomy and dining are central to French culture. The term restaurant itself originates from the French verb "restaurer," which translates to "to restore" or "to renew." French cuisine's cultural association with haute cuisine, valorized as refined and proper, positions it often in diametric opposition to many ethnic cuisines stigmatized as uncivilized or unhealthy. Solidifying French cuisine's elite status in the global cultural imagination, in 2010, UNESCO included "Le repas gastronomique des Français" (The gastronomic meal of the French) on the Representative List of the Intangible Cultural Heritage of Humanity. The concept of the gastronomic meal far

exceeds the food itself, holistically describing a social tradition of dining marked by conviviality, harmony, a well-defined course structure, and freshness of products (UNESCO, 2010). This recognition stabilizes French culture into a static, recognizable identity. Conversely, it skims over contention surrounding the "Frenchness" of cuisine, cementing a power dynamic in which French gastronomy can only incorporate influences from other cultures insofar as they can be integrated into the established tradition without tainting the French identity (Simek, 2021). Despite increasing openness of French culinary tradition to foreign flavors, ingredients, and techniques, these novelties must cautiously tread the fine line between palatability and disgust. Analyzing the integration of Indochinese rice in French cuisine, Elizabeth M. Collins explains:

> "... then, and now, racialised persons are not to be eaten with at the table, but may find a place either on it, as a consumable product, or behind it, as someone who serves, or both" (Collins, 2020).

While the French repas gastronomique is lauded as appreciative of ethnocultural diversity, in reality, it may operate as an instrument of selective cultural assimilation, enfolding novel foreign ingredients into its culinary regime without extending the possibility of inclusion to the foreign individuals themselves (Ibid, 2020). Due to continually evolving tastes and preferences, foreign, non-Western culinary elements often end up as ephemera, incorporated into the French gastronomic tradition only when temporarily deemed appealing.

I am fascinated by the symbolic significance of food and food cultures as harbingers of sociocultural meaning. Eating and dining are perceived as highly social activities among most cultures (Dunbar, 2017). Sharing food with others such as through eating together or serving diners at restaurants can function as an indispensable medium for cultural understanding and immersion. The typology of different cuisines and how they are perceived by diners all over the world often directly reflects vestiges of colonialism and exoticism (Karaosmanoğlu, 2020, Staszak, 2008). In ecological, economic, and sociological contexts, food is power; its power as a purveyor of social meaning is not inherent but rather realized and interpolated by individuals themselves.

Furthermore, I have long been intrigued by the diachrony of diasporic identity, having previously conducted extensive research on the history and contemporary lived experiences of Chinese Americans. I knew early on that I wanted to focus on the role of ethnic entrepreneurship in shaping the Chinese diaspora in France, a relatively understudied and overlooked community in dominant discourses surrounding European immigration. Whilst exploring Paris, I quickly noticed the abundance of Asian restaurants; not Chinese restaurants per se, but "traiteurs asiatiques" and other pan-Asian establishments, a marked difference from the regional Chinese restaurants that have proliferated in the United States.

After conducting preliminary research on the waves of Chinese immigration to France, largely to Paris, I discovered the economic centrality of restauration among the Chinese diaspora, especially for the first generation (Lipovsky and Wang, 2019). While restauration tends to be far less common among the descendants of Chinese immigrants as career options are more plentiful, it follows logically that the culinary institutions opened by "third culture

kids"—those born and raised in a different sociocultural context from their parents—will reflect their unique socialization (Useem and Downie, 1976). This is especially true if they choose to open Chinese restaurants—microcosms that reveal how these entrepreneurs have uniquely internalized Chinese culture despite having grown up in a Western country.

Much of France's Chinese population derives from Wenzhou, a city in the Zhejiang province located in China's Southeastern region. Wenzhou is renowned in China for its high concentration of private businesses and for serving as a primary epicenter of China's export economy. The Wenzhounese are known for their fervent entrepreneurial spirit, seen as embodying self-reliance, resilience, and a self-starter attitude (Beraha, 2014; Li, 2018). My fascination with this particular community stemmed from my curiosity regarding how and why these diasporic peoples came to France, the extent to which they have preserved close transnational ties, and how their economic activity abroad has shaped the socioeconomic fabric of the city at large. Unlike my past endeavors, I was interested in pursuing exploratory ethnographic research premised upon the principle of observing "life as it happens" (University of Virginia). This research paradigm and technique allows for a direct, firsthand examination of the culture, practices, social interactions, and experiences of entrepreneurial Chinese immigrants in France.

As the daughter of first-generation Chinese immigrants, I am constantly observing the differences in lifestyles and attitudes between immigrants and their descendants. The unique socialization of these groups creates vast divergences in individuals' perceptions of themselves, their sociocultural identity, their values, and their allegiances. While I lean closer to the American side having been born and raised in the United States, I do not feel fully tethered to either identity and its associated norms, values, and expectations. Since being in France, my Chineseness has felt more pronounced than ever. How I am perceived here feels sharply defined by my race. Chinese cuisine is often connoted via derogatory racial stereotypes in the Western imagination. Despite the globalization of cuisines and evolving cultural appetites that have helped change perceptions, Chinese cuisine and those associated with it are still situated within a precarious, subordinate sociocultural position. Studying the lived experiences of those with cultural backgrounds similar to my own despite our differing contexts of socialization yields immense academic and personal import.

Methodology

To tackle my inquiries, I sought to observe firsthand the motivations, experiences, and comportments of those in this specific entrepreneurial niche primarily through conducting full-length interviews.

Restaurants were selected through purposive sampling, informed by personal interest, alignment with my research parameters, and prior patronage. My primary criteria were: (1) the restaurant was founded and/or operated by people of Chinese heritage; (2) it was located in a relatively non-Chinese ethnic neighborhood in Paris; and (3) it appeared to cater predominantly to a non-Chinese clientele. I aimed to choose restaurants with an emphasis on distinctive branding suggesting a conscious effort to shape public perceptions of Chinese cuisine and culture.

After finding restaurants of interest, I contacted them directly via their listed corporate emails or through social media. In

my brief self-introduction both during the outreach stage and the actual interview, I described myself as a student conducting a research study seeking to better understand the experiences of French-born Chinese in the corporate restaurant industry. I informed them that the interview would be brief and that I would be including their business in a map of recommendations to share with my American peers in an effort to foster goodwill and incentivize participation.

Researcher-interviewee interactions reflect the positionality of both parties (Hmed, 2008; Philipps and Mrowczynski; 2019). Steiner Kale, professor of educational psychology at the University of Aarhus metaphorically characterizes interviewers as miners or travelers. While miners dig with the assumption that there is some definitive truth to be discovered, travelers learn by way of the journey of learning and exploration. (Brinkmann and Kvale, 2017). Over the course of the interviews I conducted, I sought to distance myself from the role of a miner, instead reflexively adapting and reformulating my interview and broader research questions.

In my case, the interviewees' statuses as restaurant owners or affiliates meant that their expressed opinions may have been influenced by commercial interests. While I attempted to come across as neutral as possible, reminding interviewees that there were no right or wrong answers, it is possible that the informants did not completely trust me due to my position as an outsider, an American student researcher, potentially engendering hesitance to share certain details. However, I believe my identity as a fellow young Chinese helped mitigate the degree of sociocultural distance between myself and my subjects, allowing for a much greater degree of liberated speech. I did not feel as if the interviewees were purposefully hiding anything from me; the sessions resembled natural, open conversations rather than sterile, prescriptive interviews.

I interviewed a total of four individuals who work at and help curate the public image of two different new-age Chinese restaurant groups in my desired research niche. One of the interviewees was himself the founder of a restaurant group. Another was the mother of a girl I previously interviewed, allowing me to gain a sense of intergenerational differences. I discovered that the two restaurant groups perceived each other as competitors, facilitating illustrative comparison. All interviews were conducted in French with some communication in Chinese or English depending on what the interviewee was most familiar with. Due to the limited time frame of the study and some subjects' lack of availability, I was unable to conduct an extensive number of interviews. This did not prove to be an issue for the purpose of this study as the goal was depth about the experiences of a selected set of individuals, not breadth as achieved through statistical representativeness. Observational data helped fill in the gaps. Following a positivistic research paradigm in which my research questions were fairly well-defined, I conducted structured observation, observing from afar my physical surroundings and subjects in their working state both as a client and interviewer (Mulhall, 2003; Salmon, 2015).

Rather than tightly structured or group interviews, I conducted semi-structured interviews lasting approximately an hour with thematic open-ended questions. The question guide I prepared in advance provided a useful schematic to ensure a comprehensive, time-efficient interview. Following the qualitative interview guide set forth by Kvale and Brinkmann, I began with broad introductory questions inquiring about my subject's educational and work background, how they arrived at their current role, their family history, and their overall business concept. Based on the direction and contents of their response, I continued to probe deeper and ask follow-up questions. Apart from questions prompting factual, more objective responses, I sought to elicit honest, unfiltered descriptions of feelings and opinions from my subjects.

To focus on the conversation at hand without worrying about taking detailed notes, I obtained consent from interviewees to take audio recordings of each interview in its entirety (Knott et al, 2022; Powney, 2018; Hofisi et al., 2014). In comparison to surveys, in-person interviews facilitate interactivity and leave room for the discovery of unexpected topics that may prove to be more relevant or substantial (Jamshed, 2014). Moreover, the face-to-face component allows for live observation of verbal and non-verbal gestures, cues, and mannerisms that can be illustrative.

I found all my subjects to be open-spirited and fairly easy to talk to. Whenever they mentioned a term or concept in French that I was unfamiliar with, they readily provided clarification. Since the interviewees primarily ranged from 18 to 30 years old with the exception of one, it felt easier to build rapport and have more naturally flowing conversations. Despite our sociocultural and economic differences, I did not feel the presence of an unequal power dynamic at play while speaking to any of my subjects. While potentially not didactically sound, I did express my own opinions to subjects at times in order to solicit their reactions. While the youngest interviewee—the one least intimately involved with the internal business operations and strategy of the restaurant group—expressed a rather pessimistic viewpoint about conforming to pressures to assimilate to Western tastes similar to my own, the restaurant owner appeared more defensive when I conveyed these critical opinions.

It is worthwhile to note that convenience sampling affected my research due to time and access constraints. Selection bias may have influenced my sample of interviewees as those who responded positively to my outreach may have been more media-savvy or keen to public engagement, especially given my status as a young foreign researcher. This limitation is acknowledged as a constraint on the generalizability of my findings.

Lastly, while interviews were conducted primarily in French with the occasional use of English and Chinese, all interviews were audio-recorded and transcribed in the original languages used by the interviewees. For the sake of analysis, I adopted a meaning-based translation approach, prioritizing the preservation of intent, tone, and nuance over verbatim accuracy. While I am fluent in English and Mandarin and have fairly advanced proficiency in French, I am acutely aware that some semantic subtleties may have been lost or altered in translation. To mitigate this, I consulted native speakers in each language when clarification was needed. While the multilingual nature of my interviews added complexity, I believe this afforded my participants the ability to express themselves in the most authentic way possible.

Literature Review: Ethnic Entrepreneurs of Taste and Diasporic Identity Formation

Scholars have frequently examined the role of culinary institutions as a critical locus of diasporic economic activities among Chinese immigrants abroad. Frank Chin, a cultural studies scientist, argues that the ethnic cuisine business reinforces the inferiority of immigrants who are only accepted insofar as they provide for the consumption and enjoyment of Asian food by non-Asian

individuals. This process often results in the commodification and reduction of Asian cuisine to exoticized stereotypes, severing it from its cultural significance and history. By pointing out the ways in which Westernized Asian cuisine may conversely perpetuate superficial, flattened notions of Asian culture and people, Chin destabilizes the notion that the success of Chinese restaurants in the West signify social mobility for immigrants (Chin, 1974). Sau-ling Cynthia Wong, Professor Emeritus of Asian American and Asian Diaspora Studies at UC Berkeley, observes that while "food pornography appears to be a promotion, rather than a vitiation or devaluation, of one's ethnic identity," food pornographers—those serving their rendition of cultural cuisine to culinary tourists—effectively "wrench cultural practices out of their context and display them for gain to the curious gaze of 'outsiders'" (Wong, 1998).

On the contrary, competing perspectives argue that the act of serving stereotypical Westernized versions of Chinese cuisine retrofitted to Western tastes and expectations actually functions as a means of deflecting colonial violence. Rather than being forcefully defined by notions of Otherness, restauration empowers these socially marginalized people to strategically choose how to stage their culture for non-ethnic consumers, keeping their identities intact (Cho, 2010).

This paper does not seek to comment on the binary question of whether a restaurant's food is authentic or not, rather shifting the discussion toward who is granted the power to arbitrate what is viewed as authentic Chinese cuisine. Furthermore, this paper does not seek to analyze culture in a broad national sense, but rather on the micro-level in regard to how individuals internalize norms, values, and dispositions within their activity of redefining culture via their own culinary concepts.

French sociologist Pierre Bourdieu famously conceived the notion of habitus, the acquired dispositions, and ways of thinking, behaving, and acting imbued in individuals as a product of their socialization. At a subconscious level, an individual's habitus fundamentally guides their decision-making processes in navigating the social world. Taste is profoundly influenced by habitus, a combination of internalized factors including one's socioeconomic position, and thereby functions as a tool of social distinction. He explains:

> "The dialectic of conditions and habitus is the basis of an alchemy which transforms the distribution of capital, the balance-sheet of a power relation, into a system of perceived differences, distinctive properties, that is, a distribution of symbolic capital, legitimate capital, whose objective truth is misrecognized" (Bourdieu, 1984).

For third culture French Chinese individuals, their habitus and how they have valorized, internalized, and appropriated the tastes of the dominant culture within which they have been socialized profoundly influence their beliefs and behaviors. Ethnic entrepreneurs are uniquely empowered to shape and produce new "tastes" with their culinary concepts.

While extant literature on representations of Chinese culture abroad has examined topics of diasporic economic activities, the ethnic labor market, exoticism, and the centrality of cuisine as a mode of exporting culture, there exists a dearth of research surrounding the specific typology of Chinese restaurants in France as

sites of witnessing, representing, and renegotiating Chinese culture and identity. Unlike in the United States, in France, Chinese restaurants, especially those specializing in regional cuisines, are much less prevalent. Nonetheless, these settings are indispensable in shaping the French cultural imagination and informing diasporic identity formation.

Sociologists Marina Avanza and Gilles Laferté enumerate how identity is not a fixed set of traits but instead is proactively formed based on an individual's unique interactions with their external environment that is laden with cultural elements. The marginalized individual is externally defined and categorized but also maintains a degree of agency renegotiating and discursively producing their own identity based on how they have internalized norms. (Avanza and Laferté, 2005). Entrepreneurs of identity are commonly defined in the literature as those who derive social or economic value from some facet of or all of their identity (Leong, 2016). They are in a pole position to define not only themselves but moreover represent the broader identity group(s) to which they identify with to outsiders (Ibid, 2016). Thus, by studying how Chinese restaurateurs, who serve as literal and symbolic entrepreneurs of Chinese identity, interpellate Chineseness and subsequently decide how to represent and share their culture, this study seeks to gain a deeper understanding of experiencing cuisine as a mode of accumulating cultural capital and conceiving Otherness. Cultural identity is not a static, monolithic concept; individuals exercise a degree of agency in internalizing, understanding, expressing, and negotiating their identities in response to social contexts and constraints.

The emergence of a new generation of young Chinese restaurateurs in Paris within the past five years has aroused a growing interest in examining their role in reshaping the narrative and perceptions surrounding Chinese cuisine. These mavericks include those born in France, exchange students, and new immigrants. For the sake of this paper, I will focus on those of Chinese origin born and raised in France, categorized in sociological literature as Third Culture Kids (Useem, 1973). Unlike their predecessors, their motivations for opening restaurants tend to be more voluntary and they often have access to better financing options. Nonetheless, although they may not necessarily be shackled by the same socioeconomic barriers their predecessors faced, they are still situated within and tied to the norms and expectations of a racially codified regime (Lise, 2020; Moutot, 2023; Mung, 2012). Recognizing this reality is crucial for understanding the continual importance of shaping and presenting cultural identity to the non-ethnic world for this new generation.

Studying restaurants as bearers of social meaning far exceeds examining the food they serve (Cho, 2010). This paper will analyze the symbolic dimensions of dining establishments including but not limited to menu design, sourcing, staffing, spatiality, ambiance, customer interactions, service, and culinary practices. For many diners, eating at an ethnic restaurant serves as a primary mode through which they experience and interpret another culture. Taking a holistic approach promotes a deeper understanding of how restaurants reflect and contribute to the production and reproduction of social meaning, cultural understanding, and structural inequalities.

Chinese restaurateurs and identity negotiation: Straddling between hypercorrection and reversal of stigma

In choosing how to represent their culture via the institution of a restaurant, an ethnic restaurateur internalizes and extracts specific elements from their habitus to then transmute them into actual practices and characteristics to be consumed by an external audience. Culture is not static or objective; rather, it is subjectively interpreted by individuals and then selectively shared with others. Restaurants and cuisine are critical mediums through which culture is deliberately staged based on these subjective interpretations. Borrowing from Professor of Social and Political Sciences at the University of Lausanne Martina Avanza, certain individuals in each identity group are more well-positioned to serve as proxies of the community, defining and shaping cultural norms and representations. This perspective emphasizes the agency even socially stigmatized people hold in constructing their self-image and the identity of the group to which they belong.

Abdelmalek Sayad, one of Pierre Bourdieu's collaborators, coins the notion of "hypercorrection" to describe the phenomenon wherein individuals with stigmatized identities attempt to correct and overcompensate for their perceived otherness through continually demonstrating their high degree of integration into dominant society (Sayad 1999). Sayad emphasizes that the stigmatized, subjugated individual "est condamné à la surenchère en tout, dans tout ce qu'il fait, dans tout ce qu'il vit et en tout ce qu'il est." Due to their stigmatization, no matter how hard they try, they cannot escape the socially imposed paradigm to which they are perpetually tethered. The agent is condemned to one-upmanship in every single facet of their life as they strive to assimilate themselves within the norms, expectations, and values of the dominant society they aspire to. They embark on a lifelong mission of "bluffing," of constructing and maintaining a precariously crafted image of who they want to be, the group to which they seek to affiliate with. In Avanza's terms, it is a matter of "appartenance," of demarcating both an aspirational reference group and a negative reference group that the agent conversely wishes to distance themselves from (Avanza and Laferté, 2015).

Scholars define this process as "anticipatory socialization" in which individuals attempt to appropriate their aspirational identity, typically the dominant identity, adopting their comportments, tastes, behaviors, and beliefs in hopes of eventually actually assuming this new, elevated social categorization (Starr and Fondas, 1992; Yamaguchi, 1998). Even though cultural identification and assimilation are often viewed as all-encompassing and distinctly social projects, on a basal level, they can be viewed as individual battles; stigmatized individuals are engaged in social battles against their will and must choose how to self-present accordingly.

Examining the practice of hypercorrection by marginalized groups requires analyzing all the subliminal ways in which they have been socialized. Do they demonstrate strong desires to assimilate, to completely identify with the norms, values, and dispositions of the dominant culture? On the contrary, are they insistent on preserving the authenticity of their own cultural identity even in the face of stigmatization? The question comes down to how marginalized individuals choose to self-present and whether their self-presentation differs based on specific social contexts.

Sociologist Erving Goffman corroborates Sayad's theorization of stigma, similarly characterizing it as a social process in which an immutable attribute becomes a justifiable basis for devaluing another individual (Goffman, 1963). As a result of being stigmatized, individuals are constrained in their ability to navigate the social world due to their inability to be accepted as "normal." He adopts an interactionist approach, arguing that individuals with stigmatized attributes that are not necessarily immediately recognized but revealed over time, like a criminal record, gradually adopt a devalued status upon revealing their condition to others. Goffman points out that once assuming or validating their belonging to a stigmatized position, the individual cannot escape this classification in the eyes of the majority. People can attempt to pass as "normal," intently picking up on the norms and dispositions of "normals" to master their ways of life and thereby conceal their deviancy. However, these passers effectively condemn themselves to an anxious state of perpetual precariousness. In Goffman's words, they can only strive to achieve "phantom normalcy," a false guise of acceptance. Despite being proximate to "normalcy," these individuals still live with the constant risk of new stigmas arising.

Emphasizing the futility of assimilationist, passing strategies, sociologist Louis Gruel, heavily influenced by Pierre Bourdieu, discusses a vastly different act of resistance to being stigmatized, known as "reversal" or "return" of the stigma. In this response, stigmatized individuals embrace the stigma and the socially inferior position they have been relegated to instead of aspiring toward normalcy (Gruel, 1985). This can manifest itself in behaving and acting in ways that openly reveal or even exaggerate their stigmatized attributes, refusing socially imposed shame and reclaiming their disqualifying traits as prideful. Bordieu conceptualizes this reversal as part of a desire for social autonomy, as a "collective reappropriation of this power on the principles of construction and evaluation of his own identity that the dominated abdicates for the benefit of the dominant as long as he accepts the choice of being denied or of denying himself in order to be recognized" (Bourdieu 1980).

In the context of ethnic restaurateurs, examining each aspect they have deliberately chosen to incorporate into their restaurant and cuisine illuminates their specific response to sociocultural stigmatization. Restaurants are sites of social meaning that far exceed the food they serve. In order to gain a full understanding of these young Chinese restaurateurs' methods of shaping cultural representations via restauration, symbolic dimensions of dining establishments including but not limited to menu design, sourcing, staffing, spatiality, ambiance, customer interactions, service, and culinary practices must be holistically analyzed.

The young Chinese restaurant owner interviewed emphasized the prevalence of "kitsch" items used to decorate his restaurant targeted toward serving trendy middle to upper-class young city-goers. French postmodernist Jean Baudrillard describes, "To the aesthetics of beauty and originality, kitsch opposes its aesthetics of simulation: it everywhere reproduces objects smaller or larger than life... it apes forms or combines them discordantly; it repeats fashion without having been part of the experience of fashion" (Baudrillard, 1998). Kitsch objects are expendable aesthetic and cultural iconography. They tend to be unrefined and flattened, ersatz simulations of a bygone era stripped of historical significance. In Baudrillard's terms, they are "pseudo-objects" which reproduce

but should not be confused with the "authentic" (Baudrillard, 1970).

Kitsch objects are appealing to today's neo-bourgeoisie for their self-aware irony and effortless ability to be appreciated and understood, facilitating a positive affective response for the viewer (Ortlieb and Carbon, 2019). This marks a profound shift in taste; kitsch objects were once intended as a means for lower classes to replicate art enjoyed by the bourgeoisie but have now undergone a reversal in which they appeal to high-brow and hipster tastes (Hsiao 2015). Artmaking and an individual's taste in art functions as a fundamental mode of symbolic communication about one's identity as influenced by their socialization.

While hipsterism typically arises out of disillusionment with traditional notions of economic prosperity and bourgeois taste, hipsters nonetheless tend to be relatively well-educated and middle to upper-class. Importantly, they cement their social position not necessarily with physical capital, but more so by accumulating cultural capital. Modern hipster culture is characterized by an infatuation with vintage, birthed out of nostalgia for an over-glorified past era. Owning kitsch items is seen as ironic, elevating a hipster's social position by projecting to others that they understand the distinction between good and bad taste but actively choose not to conform to bourgeois notions of taste they deem superfluous (Yonts, 2018). Thus, by displaying "kitsch" representations of Asian culture like lucky cats, dragon lanterns, use of the color red, bamboo plants, and plastic tableware printed with Asian-inspired designs (Appendix A), the restaurant owner appeals to the seemingly perverse tastes of their desired target clientele. This restaurateur is not alone in their design choices; similar restaurants in the city with the same target demographic adorn their space with Asian-inspired wallpaper, lanterns, and Chinese porcelain (Appendix B).

Figure 1: Abundance of Lucky Cat (traditionally Japanese) figurines

On one hand, the use of kitsch decor can be interpreted as an act of returning to or an ironic reversal of stigma. By overtly displaying kitsch Chinese iconography, the restaurateur may be attempting to reclaim elements of Chinese heritage, traditions, and aesthetics that are often stigmatized and fetishized. This reappropriation helps restore agency to the ethnic entrepreneur in defining their own

cultural narrative.

While the use of kitsch aesthetics can be understood as a strategic effort to appeal to a culturally literate clientele or even as a form of cultural reclamation, it risks reinforcing the very stereotypes it seeks to subvert. The deliberate deployment of kitsch cultural decor may inadvertently flatten complex cultural iconography into commodified, reductive symbols for consumption by non-ethnic audiences. In attempting to portray Chinese culture in a manner that is trendy and palatable, restaurateurs may feel pressure to aestheticize their culture in ways that align with, rather than challenge reductionist narratives. As such, while kitsch may serve as a strategic tool for cultural expression, it may also circumscribe what types of cultural representations are seen as desirable.

Figure 2: Small plates, "oriental"-inspired plastic cups

Analyzing other elements of the restaurant's design and ambiance helps paint a fuller portrait of the restaurateur's intentions which are ultimately influenced by their individual socialization. The interviewee pointed out his desire to "garder l'esprit du Marais," retaining the building's "travaux modernes" with original exposed brick walls, wooden ceiling beams, clay tiling, and bar to produce a coveted vintage feel. Blending nostalgia for the past with modernity, the strategic incorporation of anachronistic Asian design elements against the rustic, modernist backdrop of the surrounding non-ethnic businesses renders the space markedly different from the first-generation Chinese restaurants in the city.

The owner is well aware of the profile of his clientele. He emphasizes that his primary competitors are, counter-intuitively, not other Chinese restaurants, but restaurants that similarly target French consumers who are "jeunes, assez branchés" (young and trendy) and spend most of their time in the quarter. The restaurant's location in the chic le Marais neighborhood profoundly impacts its spatiality, or the social phenomena shaped by and expressed in physical space (Kesteloot, 2009). While the restaurant is influenced by the spatial clustering of many other contemporary, hipster bars and eateries the quarter is well-known for, the owner points out that there are no other restaurants in the specific quarter he considers

direct competition. However, he explains that the menu pricing is influenced by that of other restaurants in the immediate area.

The implications of the restaurateur's expressed perceptions are twofold. First, this may illuminate the restaurateurs's attempt to materially and symbolically differentiate themselves from traditional Chinese restaurants of the previous generation by offering a hip, contemporary dining experience that distinguishes it from more conventional Chinese establishments. Furthermore, pricing their menu items in alignment with other French rather than Chinese restaurants suggests that the restaurant places importance on presenting itself as an "upscale-casual" establishment. On the topic of location, he repeatedly emphasizes how his restaurant's location allows it to "profiter de force de l'entourage" (benefit from the strength of surroundings) in this "quartier iconique avec les galeries, petits shops, le Marché des Enfants Rouges," a renowned tourist attraction. Apart from Parisians, opening the restaurant in le Marais allows it to capitalize on the foot traffic of passersby non-Chinese tourists. Understanding these intentions in gestalt suggests that the restaurateur's choices are primarily guided by hypercorrection. If he wanted to target Chinese consumers, it would make more sense to situate the restaurant near other Chinese businesses and restaurants. While it could be argued that he is simply trying to avoid competition in oversaturated areas, given the prominence of digital networks among the Chinese community abroad, he would also focus on promoting the restaurant via Chinese social media networks instead of solely on Western platforms like Instagram.
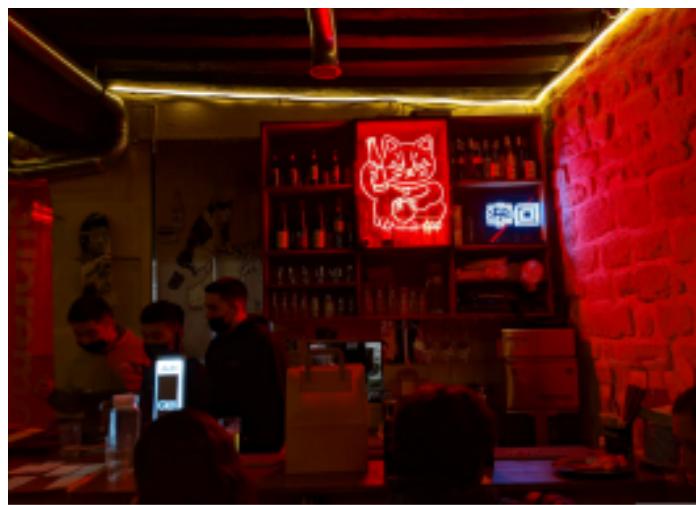

Figure 3: Dark, fluorescent lighting, exposed brick

When asked to categorize his restaurant, the young entrepreneur classifies it as a "Cantine chinoise parisienne." In France, cantines are typically lunch restaurants, and casual eateries known for serving students and office workers (Do it in Paris). While not typically expensive, these institutions are nonetheless intended to serve the sociocultural bourgeoisie, as seen in the emphasis on fresh, local, products and a plat du jour, daily specials that usually change depending on what is in season. The target audience is also revealed in the fact that these cantines tend to be decorated in a modern, trendy "industrielle-chic" style, often characterized by neutral colors, large windows, exposed brick walls, and bright white lights (Wang et al., 2019).

This deliberate positioning reveals not only a commercial strategy but can also be contextualized within deeper dynamics rooted in cultural capital. An individual's social class is not solely defined by their material wealth as measured in dollars or assets. Rather, it is an amalgamation of factors including their level of education, social network, and importantly, cultural capital. Bourdieu defined the latter as an individual's understanding and embodiment of a society's "high culture," constituted by symbolic elements including art, tastes, clothing, mannerisms, and competencies that an individual absorbs by being socialized as part of a particular social echelon (Bourdieu, 1984). This renders it possible for materially rich people to co-opt and reappropriate the lifestyles and culture of less wealthy groups whilst paradoxically bolstering their own higher social status.

Figure 4: Copy of main course (dumpling) menu

The popularity of streetwear among wealthy consumers lucidly demonstrates this appropriation of subcultural styles by the rich. Streetwear is a form of self-expression that emerged from marginalized groups living in inner cities, influenced by elements of urban culture like hip-hop, skateboarding, and street art. Over time, it became celebrated by elite consumers and the fashion industry. Upscale fashion brands incorporated streetwear-inspired elements into their designs, resulting in the creation of luxury streetwear brands. This evolution has resulted in the mainstream co-option and repackaging of streetwear, severing it almost entirely from its original urban subcultural origins (Ayuningtyas and Adhitya, 2021; McLaughlin, 2019; Sola-Santiago, 2017). In this illustrative case, the wealthy appropriate elements from lower-class cultures in order to display their cultural capital and socially distinguish themselves. This project is far from neutral; the rich possess the material and social capital enabling them to demarcate what types of cultural elements and to what degree they are trendy or acceptable.

In regards to ethnic cuisines, trying cuisines of marginalized cultures, regardless of the authenticity of the culinary experience, can allow elites to signal virtues like cosmopolitanism and open-mindedness by boasting diverse, globalized palates. Eating

at a Chinese "canteen" designed to appeal to the preferences of non-Chinese folks allows Parisians to feel as if they are experiencing and discovering an exotic culture without having to depart very far from their own comfort zone. The restaurateur outlines what he views to be the "Nouvelle génération de cuisine chinois" (new generation of Chinese cuisine): "Plus facile à approcher et plus compréhensible" (easier to approach and more comprehensible). French diners and tourists can experience a simulation of Chinese culture via a setting, menu, presentation of dishes, and language familiar to them yet still novel enough to be compelling.

This logic appears to be shared amongst owners of similar restaurants in this category, even with slightly varying educational and family backgrounds. Mamahuhu, a Paris-based restaurant group with three modern, upscale-casual Chinese eateries located in the 4th and 10th arrondissements, quarters that are not known for being occupied by Chinese people, also seeks to "[naviguer] entre tradition et modernité" (navigate between tradition and modernity). Its press package to the public delineates its driving mission as follows:

> "... we want to free ourselves from the conventional codes of Asian food and embrace our quirky side! We work with traditional and childhood recipes but in a setting that aims to be uninhibited and festive. To sum up, we are neither modern nor traditional, we have chosen to create our own stories and atmospheres, personal and timeless" (Mamahuhu Group, 2022).

Despite founder André Tan's prestigious background as a SciencesPo Master's graduate and ex-investment banker, he grew up heavily immersed in the traditional Asian restaurant industry, first working in his family's pan-Asian restaurant in Fontenay-sous-Bois and later in Asian canteens in the 13th, home to Paris's "Chinatown." He describes traditional Chinese restaurants like his family's as "assez naturel : c'est ce que les gens savaient faire en arrivant" (quite natural: that's what people knew how to do when they arrived), in contrast to today's young Chinese founders who choose to open restaurants on a far more voluntary basis (Tan, 2022). While Tan is the son of first-generation immigrants and spent time in China for the specific purpose of immersing himself in Chinese culture, unlike the other restaurant owner whose parents grew up in France and who did not work in Chinese restaurants prior to opening his own, the two restaurateurs' establishments are markedly similar in their kitsch-cool yet modern decor, pan-Chinese offerings, convivial yet relaxed atmosphere, predominantly French clientele, and guiding philosophy. Thus, despite their slightly differing internalization of Chinese culture, they seem to share similar interpellations into French norms and understandings of dominant preferences. This consistency seems to suggest the pervasiveness of desires to hypercorrect by ethnically marginalized individuals. At the same time, neither restaurateur is attempting to provide a fully "authentic" culinary experience, rather departing from the culturally codified expectations of traditional Chinese restaurants altogether.

La Carte: Mapping culture via the menu

"The carte, the map, the menu, remains with us as one of the primary means by which food is represented, textualized, as a metonym of the boundaries of the nation" (Cho, 2011).

Author and assistant professor of English at the University of Western Ontario Lily Cho provides a unique interpretation of diasporic agency through the lens of Chinese restaurants, a stalwart in rural Canadian communities. As a result of transnationalism, these no-frills culinary institutions are profoundly bicultural, even if they serve "authentic" Chinese cuisine. Cho centers the agency of Chinese restaurant owners and focuses on the centrality of Chinese restaurant menus as physical referents of bifurcated Chinese-Canadian identity as projected to the external community. She explains:

> "The menu stabilizes a kind of Chineseness which offers its consumer the possibility of a reassuring uniformity not only in the Chinese food on the menu, but also in the Chineseness which Chinese food signifies. Chinese restaurant menus present a comforting, palatable Chineseness which can be reproduced and disseminated through the institution of the restaurant" (Cho, 2010).

These young, trendy Chinese upscale-casual eateries share similar menus not just in the dishes offered but moreover in their structural and aesthetic composition. The aforementioned restaurant in the Marais offers a small menu with only 6 different main dishes, one of which is seasonal; each dish is a type of fried dumpling distinguished only by filling flavor. On the menu, diners can also find "tapas," small appetizers ranging from popcorn chicken to edamame, lucidly showcasing the restaurant's pan-asian character and lucid Western influence. The menu features an extensive beverage selection including soft drinks, wines, and specialty craft cocktails, offerings seldom found in traditional Chinese restaurants. When asked to describe the fare, the restaurant owner described his desire to offer "les choses spéciales pour la clientèle parisienne tout en gardant l'authenticité" (special things for Parisian customers while retaining authenticity).

Cho focuses on the banality of certain offerings in Chinese restaurants intended to please the palates and expectations of Western customers. She explicitly characterizes this choice by restaurateurs as a "compulsive return to the stereotype" that gives non-Chinese diners exactly what they expect and desire from Chinese food, thereby "[fulfilling] the colonial hunger for itself; they consume their own projection." She continues:

> "The reproducibility of Chineseness embodied in the restaurant menu frustrates the construction of a knowable authentic Chinese subject at the same time that it offers up a palatable Chineseness which gives the impression of knowability" (Cho, 2010).

Seen in this light, the Chinese subject and their identity remain wholly intact by providing a pastiche of Chineseness via Westernized Chinese cuisine. Appealing to the tastes of Western diners is not an act of conforming to dominant norms that require significantly diluting or sometimes simply rejecting authentic Chinese cuisine, but rather of cultural preservation and self-definition.

While the specific restaurants in our analysis may not fall into the category of the eateries Cho describes, given their vastly different audiences, her commentary on not only the contents but moreover the form of menus in ethnic restaurants remains highly relevant. Our restaurant owner interviewee notably critiques the

format of menus in traditional Chinese restaurants in France, characterizing them as unwieldy books that can be overwhelming and exceedingly difficult to interpret by non-Chinese diners. By offering a short, sleek menu replete with trendy graphic design, the restaurant does not only improve its readability and accessibility to French clients but can moreover appeal to desires for freshness and seasonality emphasized amongst its target audience.

Figure 5: Petit Bao: Use of Asian ingredient cans, bamboo baskets

Flavor Frontiers: How Far is Too Far?

When asked about the flavors of the dishes at one of the most well-known new-age Chinese restaurants in Paris, one of the interviewees pointed out that the dishes, though found in traditional Chinese cuisine, were "plus sucré et plus acide... et aussi avec assez du lait" (sweeter and more acidic... and also with enough milk). The other restaurant owner pointed out their special signature dumpling dish known as the "Cheesy," pan-fried dumplings filled with pork and Emmental cheese, a popular cheese among the French largely primarily manufactured in France-Comté.

The types of flavors present in the dishes served at these "new-age" Chinese restaurants intended for non-Chinese audiences must straddle the fragile balance between being foreign enough to satiate diners' desires for an exotic encounter yet familiar enough to be deemed palatable (Cho, 2011; Finkelstein, 1989; Janes, 2014; Karaosmanoğlu, 2020). A reaction of disgust to a foreign flavor symbolically marks the departure from acceptable to transgressive or rogue foreign cuisine (Janes, 2014). For restaurateurs and chefs, serving food to non-ethnic audiences is an act of mutual negotiation, to search for a point of compromise between diners' gastronomic and cultural curiosity and the preparation of traditional ethnic cuisine (Gibet, 2019).

Ethnic restaurateurs are in charge of demarcating the boundaries of authenticity and culinary tradition via the flavors they choose to serve to their primarily non-ethnic clientele. Certain dishes are ubiquitous among restaurants in China yet nearly completely absent in Chinese restaurants serving Western audiences. An example brought up by sociology professors Shun Lu and Gary Alan Fine in their work examining how restaurateurs fit Chinese food into specific market niches is whole steamed fish, which is perceived as unappealing to non-Chinese tastes due to the traditional consumption of the fish in its entirety, head and tail included, as well

as the emphasis on the flavor of the fish itself which may be perceived as either too "light-flavored" or "fishy" (Lu and Fine, 1995).

How a Chinese restaurateur chooses to adapt the flavors of the dishes served closely corresponds with their perceptions of their target clientele and their level of exposure to Chinese cuisine. Demands for authenticity vary depending on the sociocultural context of the market and diners' knowledge of Chinese culinary tradition. Given Paris's status as a globalized city with a fairly large concentration of locals and tourists who likely have a desire to cultivate culturally diverse palates, these restaurateurs may perceive there to be a higher demand for dishes and flavors which adhere to culinary tradition. After dining at these establishments, I was pleasantly surprised by how closely the dishes corresponded to those prepared by my parents and that I have had during my visits to China. If demands for authenticity were at all not considered a priority for these restaurateurs, they would not have deliberately chosen to brand their restaurants as Chinese instead of pan-Asian or fusion.

As aforementioned, this paper does not seek to comment on authenticity or the opposite. In regards to flavors, restaurateurs' decisions regarding what flavors to offer are based on how they view their guests' tastes, in the broad sense. These decisions are often readapted to keep up with evolving trends and tastes. For example, if a restaurateur perceives their target diners as aligning more closely with the identity of the connoisseur rather than the consumer, they will correspondingly prioritize non-food elements of the dining experience like ambiance and food presentation. Lu and Fine (1995) continue:

> "Some restaurants present their food with a stronger flavor, others with a lighter one, but in either case, the decision is made on the basis of customer responses, mediated by servers and interpreted by the owner. Objects acquire meaning through the responses of those who experience them, not through a global ideology of how they should "truly" be" (Lu and Fine, 1995).

Conceptions of authenticity comprise only a singular concern in the negotiation between the entrepreneur in charge of staging cultural identity and diners. For the restaurateurs in our study, to attract a non-ethnic clientele with relatively high degrees of cultural capital, the flavors offered must provide diners with a novel culinary experience that is not overly foreign yet nonetheless satisfies their desire to validate themselves as open-spirited individuals with a worldly taste.

Forging Mavericks: Processes of Entrepreneurial Socialization

There exists a vast corpus of literature examining factors that influence an individual's desire to pursue entrepreneurship. Many economists propose that the decision to become an entrepreneur instead of pursuing salaried work as an employee is centrally based on standard utility maximization. Economics professor Charles A. Campbell delineates that in choosing to become an entrepreneur versus an employee, an individual weighs between his potential profits from either option (Campbell, 1992). The difference in utility between the two options is influenced by the expected average income from pursuing entrepreneurship multiplied by the probability of success compared against the income from regular,

salaried work multiplied by the probability of finding stable work. Other scholars have added macroeconomic factors to the economic theory of entrepreneurship, pointing out the profound impact of interest rates and business-creating environments in a geographic area on the perceived viability of entrepreneurship (Amit, Muller, and Cockburn, 1995; del Olmo-García, Crecente, and Sarabia 2020).

Much of the extant research on entrepreneurship seeks to define unique personality traits that inherently render business owners more likely to gravitate toward entrepreneurship (Greenberger & Sexton, 1988). However, this approach has been critiqued for upholding an overly static understanding of entrepreneurs, their intentions, and their behaviors, disregarding their ability to learn, develop, and grow with each experience and endeavor. While identifying qualities common amongst entrepreneurs can provide useful insights into part of what it takes to commit oneself to self-employment, these traits are not necessarily innate. The personality traits of an entrepreneur often manifest directly in their behavior (Gartner, 1988).

Entrepreneurship occupies a double dimension; it is often steeped in an individual's desires to assimilate into and elevate themselves within both economic and social spheres. Literature regarding the socialization of entrepreneurs generally focuses on an individual's educational experiences, absorption of norms, leadership capabilities, and values, all of which can be influenced by their family, peers, industry, and internal psychology. Being exposed to a family business from a young age can yield both promotional and deterrent effects on an individual's motivation to become the business's successor or pursue self-employment (Lozano-Posso and Urbano, 2017; Nason et al. 2019). These differential effects may depend on their relationship with family members, sense of professional fulfillment, and feelings of ownership over the business (Björnberg and Nicholson, 2012).

Moving beyond a purely economic dimension, H. Bouchiki and J. Kimberly (1994) put forth a typology of the "genesis of the entrepreneurial act," delineating five different types of decisions to become an entrepreneur. These include the cases in which individuals have no choice but to be self-employed, such as when they are unable to find salaried work. There is also the opportunistic decision in which the entrepreneur is not actively engaged in an entrepreneurial venture but rather seizes a compelling opportunity that arises at a given moment in time. They also discuss the scheduled decision in which the entrepreneur has been surrounded by entrepreneurial activity their entire life, such as a family business, and thus views entrepreneurship as the expected, most viable path.

Sociologists Jose Arocena et al. elaborate on the socialization of entrepreneurs, theorizing that there exist "three poles constituting a system of action causing the appearance or disappearance of the creative project" (Arocena et al., 1983). These include the personal pole, an individual's upbringing and background, the relational pole, concerning their network and environment, and the professional pole, or their professional savoir-faire acquired via experience and observation. An entrepreneur's unique role as an agent of innovation is demarcated by their risk appetite (Boutillier and Uzunidis, 2014). Being socialized in certain networks and observing different social, familial, and institutional conditions that help an individual manage the

perceived level of expected risk can greatly motivate them to launch an entrepreneurial endeavor.

Associate Professor at the University of Missouri-Kansas City Charles Murnieks and co-researchers further expand on the formation of entrepreneurial identities. Individuals interpellate and subsequently internalize external perceptions of what it means to be an entrepreneur (Murnieks, Mosakowski, and Cardon, 2014). Even though the specific roles and behaviors expected of entrepreneurs are not universal, objective notions held among members of society, the notion of entrepreneurial identity in an aspiring entrepreneur becomes the central bedrock of their self-conception. This encourages the individual to affirm their identity by enacting the expected behaviors associated with it as a means of building self-esteem and experiencing other forms of positive affect.

Viewed through this lens, it is plausible that the decisions of these young French-born Chinese to open new-age, trendy Chinese restaurants in Paris may stem primarily from their instrumental rationality, referring to a systematic and logical approach to decision-making premised upon principles of cost-benefit analysis (Bréchet and Prouteau, 2009).

The restaurateur may simply recognize the burgeoning demand for Chinese cuisine among non-Chinese audiences and seek to tap into a lucrative market. By adapting the menu, presentation, or dining experience, they aim to attract a broader customer base and increase their revenue potential. Cultural identity can function as a strategic asset or branding choice. A young Chinese spokesperson at the previously mentioned restaurant's primary competitor highlights the rising popularity of establishments with "Un visage chinois" (a Chinese face).

Figure 6: Display of Chinese teapots and spice jars

To set itself up for success, a restaurant must ensure that the food they serve is appealing to its desired clientele. It cannot bank on the possibility that diners' attitudes surrounding certain foods and flavors will change over time. In the case of these third-culture French Chinese entrepreneurs, diluting or modifying flavors based on perceptions of non-Chinese diners' tastes may be chiefly motivated by economic concerns. Serving cuisine strictly adhering to Chinese culinary traditions may not be a priority. Rather, interviewees highlighted their intentions of allowing non-Chinese

audiences to discover Chinese food in an accessible, contemporary way that still caters to their Western tastes.

From a profit standpoint, the restaurateur interviewed expressed that sometimes, using traditional vegetables, ingredients, and spices is not cost-efficient given the need to source or import specialty items. Importing from abroad feels especially unnecessary if ensuring strict adherence to Chinese culinary tradition is not considered a primary concern. However, all interviewees conveyed their desire to uphold some degree of proximity to culinary tradition. The restaurateur emphasized the savoir-faire of their shifu (executive chef) and the use of family recipes as a springboard. Thus, while these restaurateurs are ultimately subservient to the tastes of their Western audience, they must fulfill diners' desires for a semblance of authenticity, even if illusory.

Moreover, offering a limited menu is partly influenced by the restaurant owner's desires to streamline sourcing, inventory, and preparation operations. With fewer options to prepare and fewer ingredients to manage, the restaurant can simplify processes, minimize customer wait times, and deliver faster service. The shorter, sleek-looking menu also allows the restaurant to create a modern and curated brand identity, amplifying its appeal to a more upscale clientele and thereby allowing for the restaurant to charge higher prices. Moreover, knowing that they are targeting French diners, it makes sense to include an extensive drink list to easily cross-sell beverages to these consumers alongside food.

Figure 7: Chinese lanterns, bamboo, porcelain inspired tableware

In a world-renowned culinary hub like Paris, differentiating oneself from competitors is critical to stay afloat. By defining and operating within a specific, relatively undersaturated niche of contemporary, trendy Franco-Chinese eateries, these restaurateurs can position their restaurant as a unique offering in the market, solidifying their competitive advantage. However, the restaurant's targeting of French rather than Chinese diners means that it must inevitably compete with neighboring non-Chinese restaurants. Thus, their economic success depends on the trendiness of Chinese cuisine among non-Chinese audiences, which can be volatile due to changing social perceptions of the Chinese population. It seems implausible that these restaurants can, or even desire to, completely depart from the expectations of Chinese culture and cuisine as the restaurateurs still place value on preserving some degree of tradition and culinary authenticity. Therefore, they may still be impacted by negative stereotypes surrounding Chinese food and restaurants in general.

Importantly, these entrepreneurs of taste in this relatively niche market understand that they are involved in the dual dynamic of serving food that appeals to and corresponds to market preferences whilst simultaneously influencing changes in the market (Lu and Fine, 1995). Thus, supply and demand each actively produce the other.

While economic motivations are prominent, they are not mutually exclusive from cultural considerations. Many restaurateurs strive to strike a balance between preserving the goals of cultivating authentic cultural experiences whilst also staying relevant in a hypercompetitive market with constantly evolving consumer demands.

Conclusion: Implications for Cultural Identity Negotiation and Sociocultural Dynamics

This research study aims to investigate the sociological phenomenon of the public staging of diasporic identity and degrees of acculturation by examining mercantile strategy in regard to the activities of French-born Chinese restaurateurs and affiliates. Specifically, it focuses on the niche segment of Chinese restaurants in Paris owned and operated by individuals of Chinese descent, but which primarily cater toward a non-Chinese clientele.

Dining and food consumption are fundamentally social activities that take on different meanings based on sociocultural contexts and diners' habitus. The rising popularity of Chinese cuisine, at least in the way that it is served by these "new-age" third culture restaurateurs, demonstrates just how profoundly ethnic entrepreneurs can influence dominant cultural narratives by strategically staging their foreignness. Symbolic and physical forms of culinary tourism, the deliberate, exploratory engagement with foodways perceived as foreign, can thus fundamentally reshape narratives of Otherness by turning cultural difference into a site of discovery and personal value creation for non-foreigners. Traditionally marginalized individuals are not passive interpolators of norms and expectations but rather wield a marked degree of agency in defining themselves in relation to the dominant culture. Understanding these phenomena yields an array of implications:

Firstly, while hierarchies of taste are subject to change based on shifting perceptions of what constitutes "highbrow" taste, it remains unlikely that ethnic cuisines historically critiqued as inferior can undergo a complete paradigmatic shift from lowbrow to highbrow status (Bourdieu, 1984). Even if certain elements get integrated into the haute culture and are embraced by the sociocultural bourgeois, these cuisines are often fundamentally altered or adapted to cater to the dominant tastes of the cultural elite. In the process, they are often severed from their original, authentic cultural context and significance. Moreover, the mainstream acceptance of an ethnic cuisine does not correspond to the social integration of the people whose culture the cuisine derives from.

Secondly, contrary to dominant framings that cast marginalized people as passively complicit with static norms, these entrepreneurs of cultural identity have a marked degree of agency in deciding how to confer cultural value and meaning to the broader public. This ongoing process of mutual identity negotiation can take place in various domains including but not limited to cuisine, art, fashion, and media. What may be perceived as the commodification and flattening of culture may be a strategic choice enabling these ethnic entrepreneurs to rewrite their own narrative and engage in

cultural self-preservation. However, if it is the case that cultural assimilation is the restaurateur's ultimate goal, Asian cuisine, no matter how much it is contorted to fit the norms of the dominant society, will never fully be disentangled from its stigmatized cultural origins.

Finally, ethnic entrepreneurs are dually socialized within the context of differing sociocultural dispositions, behaviors, norms, and tastes in addition to the more pragmatic principles of instrumental rationality. Depending on their desired audience and image, they draw upon their cultural background, social networks, and perceptions of clients' tastes and profiles to create niche business concepts that can profoundly shape external cultural perceptions. At the same time, as business owners, their goals are also mediated by concerns related to broader market dynamics, consumer trends, and economic realities to ensure the viability and sustainability of their ventures. It would be a vast oversimplification to view entrepreneurial pursuits through a purely economic lens. Entrepreneurs with a heavy focus on branding toward certain audiences, particularly those targeting clientele outside of their own sociocultural group, are likely in pursuit of both economic and social capital.

For future research, a comparative analysis between the staging of culture via culinary institutions by different diasporic communities, examining their unique mercantile strategies, would be valuable. Rather than purely interviewing those on the internal business side, informal interviews or surveys could be conducted with restaurant clientele themselves to gauge how they interpret and engage with the restaurateur's choices. Further, it would be illustrative to interview other stakeholders in the dining and restaurant industry such as executives of corporate groups that invest in restaurants to understand what they forecast as trends among consumers.

The Chinese diaspora in France, especially Wenzhounese immigrants, embody transnationalism, maintaining close networks domestically and abroad (Li, 2018). Correspondingly, it would be worthwhile to explore the transnational physical and virtual networks that influence the strategies and operations of these "new-age" Chinese restaurants. Learning how these establishments are perceived by mainland Chinese audiences could offer meaningful insights into the nuances of transnational identity and globalization within diasporic communities.

In regards to the sociology of entrepreneurship, a key area of adjacent research involves investigating what motivates ethnic entrepreneurs' decision to pursue a portfolio of multiple, potentially diverse business ventures. How do ethnic entrepreneurial logic and activities differ across cultural domains? Studying entrepreneurial failures can shed light on what psychological factors and behavioral traits help entrepreneurs cope with setbacks and manage to bounce back.

Lastly, a logical extension of the current study would be to examine the broader sociocultural implications of the rising popularity of Chinese cuisine served by third-culture Chinese restaurateurs. This could involve exploring how their practices facilitate cultural hybridity, the dynamic interplay of cultures, and influence the broader discourse surrounding multiculturalism heavily emphasized in Paris and other global cities. A focused analysis of power dynamics as reflected within Asian fusion cuisine, a genre that reflects the deliberate, complex exchange of different cultures, could offer valuable insights into how restaurateurs across cultures navigate and reshape narratives surrounding cultural identity. Concurrently, it would be meaningful to examine the unique role of non-ethnic restaurateurs who extensively utilize foreign culinary ingredients and techniques. As individuals endowed with greater sociocultural capital and often more visibility by mainstream audiences, how do they contribute to either reinforcing or deconstructing dominant narratives? This question raises other interesting inquiries surrounding authenticity, appropriation, and who should be able to profit from the performance of cultural differences.

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"Where have our Mothers Gone?": Combating Native American Maternal Health Disparities with Traditional Birthing Practices in Southwestern Indigenous Communities

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This piece examines Native American maternal health disparities in the United States and proposes an integrated form of maternal care for Indigenous communities. Native Americans have some of the highest rates of maternal health disparities across ethnic and racial minorities, yet the underlying causes of these issues remain poorly understood. Native communities continue to endure violations of their physical, mental, emotional, and spiritual health. Drawing on traditional birth practices from these communities can alleviate these issues. Incorporating evidence from maternal health studies, personal interviews, and a case study of the first and only Native American integrative health clinic in the United States, this piece demonstrates the successful potential of Indigenous integrative health practices. It argues for the integration of traditional Indigenous birthing practices and Western forms of maternal care. This integrative approach aims to bridge cultural gaps in maternal care given to Indigenous communities and address issues of medical racism and trauma.

Introduction

Rosa, a Mexican and Native American (Diné and Nde) woman, was in labor at a hospital in Los Angeles, California. This was supposed to be a time of receiving support and compassion as she brought new life into the world, but that was far from what she received. The medical staff questioned how many kids she had already had and pushed her to sign medical forms written in English which she could not read. It was only after her daughter was born that Rosa learned that the medical staff were trying to get her to sign a consent form for tubal ligation. If she had signed those papers, I would not be here, because Rosa was my grandmother. Her fighting spirit and luck allowed three more generations of strong Mexican and Native women to be born.

There are high rates of maternal health disparity within Native communities, with Native Americans being up to 4.5x more likely to die from pregnancy-related causes than white mothers are (2017 UIHP Community Health Profile). What is even more striking, is that 93% of Native maternal deaths are preventable as determined by CDC Maternal Mortality Review Committees in a 2017-2019 data set that covered 36 states in the US (Trost SL, Beauregard J, Njie F, et al., 2022). These issues, as shown in the story of my grandmother, are not solely a matter of history. Medical racism and colonialism imposed upon Indigenous people continue to pervade our communities and mothers' wellness. Today, Native Americans face extreme disparities in maternal and infant health outcomes. Colonialism brought genocide, new diseases, and a war on Native cultures that pervades the US to this day. "Kill the Indian, save the man" was at the core of the government's philosophy on assimilating Native peoples (Pratt, 1892). This sentiment led to banning traditional ceremonies, prohibiting speaking Native languages, forced sterilizations, and separating Native families (Waxman, 2022; Lawrence, 2000). Native peoples were not seen as human beings, and their health was disregarded. If colonialism had not stripped us of our traditional ways of maternal care, would our mothers' health outcomes be different? Where Western medicine falls short, research shows that culturally relevant care and policy changes can fulfill the needs of expectant Native parents (Lewis, Myhra, 2017). This issue is both medical and political, and potential solutions can serve as a blueprint for tackling further health disparities in Native communities, other marginalized communities in the US, and populations globally who are susceptible to poor maternal health outcomes.

## Native American Maternal Health Outcomes

A.

Percentage of pregnant women receiving early and adequate prenatal care by Race/Ethnicity (of mother) 2022

B.
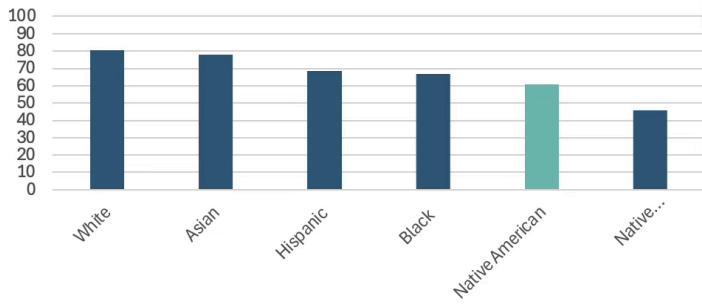
Maternal Mortality Rate, UIHP Service Areas, 2010-2012

C.
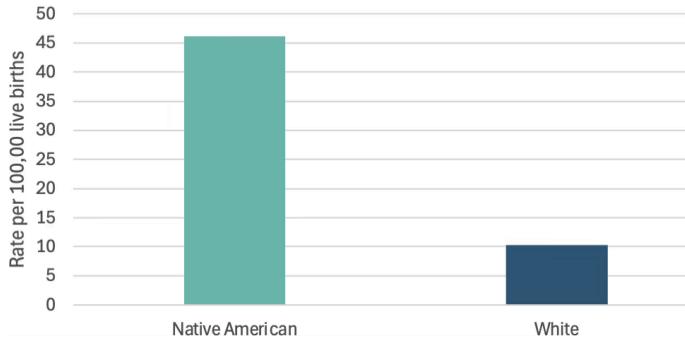
Causes of Pregnancy-Related Death Among Native Americans
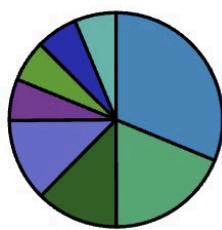
- Mental Health Conditions
- Hemorrhage
- Amniotic fluid embolism
- Infection
- Cardiac and coronary conditions
- Collagen vascular/autoimmune diseases
- Conditions unique to pregnancy
- Injury

Figure 1: Maternal Health Outcomes for Native Americans. A. Percentage of pregnant women receiving early and adequate prenatal care by Race/Ethnicity (of mother) 2022. B. Maternal mortality rate across Urban Indian Health Program service areas (2010-2012) C. Causes of pregnancy-related death among Native Americans

Maternal health outcomes throughout the United States are bleak in comparison with peer countries. The United States has a maternal mortality rate of 26.4 deaths per 100,000 live births in comparison to 3.8-9.2 among countries with similar economic status (Kassebaum, Barber, et al., 2015). These dismal health outcomes are especially prevalent among marginalized communities in the US, namely among rural communities and racial minority groups. Native Americans in particular experience extreme disparities in maternal health due to the impacts of colonialism which banned many traditional practices, led to limited access to care in rural reservations, and systemic racial discrimination. Limited access to hospitals could be a significant contributing factor to these outcomes. About 1 in 5 Native American women in rural areas live at least 30 miles away from a hospital with obstetrics, which could be a contributing factor to the high maternal morbidity and mortality that Native people experience (American Indian and Alaska Native Maternal and Infant Mortality: Challenges and Opportunities). However, across Urban Indian Health Program service areas, Natives continue to experience these disproportionate outcomes [Figure 1B] (Urban Indian Health Institute, 2016). While distance from obstetric rare for Natives in rural areas can be a large contributing factor to disparities in Native maternal health, it does not encompass a complete picture. More research on these disparities is needed in both rural and urban settings, and must hold community needs at the forefront of any research goal. Despite the fact that Native Americans and Alaskan Natives have disproportionately high maternal deaths and health disparities compared to other racial and ethnic groups, there is little known about the root causes. Native Americans in particular are seldom included in maternal health disparity research, creating a significant need for community-driven research on Native maternal health.

When studies do include or highlight Native Americans, they often reveal dismal health trends. One study on maternal health outcomes for Native Americans notes, "Despite AI/AN maternal mortality being disproportionately high compared to other racial/ethnic groups, relatively little is known about root causes" (Heck, Jones, et al., 2021). Native Americans are severely underrepresented in academic research, and their maternal health outcomes are no exception. The reason for their exclusion is often because the Native population is much smaller in comparison to other racial and ethnic groups, deeming them statistically insignificant. This creates a large gap of knowledge in the pursuit of determining the severity of the maternal health disparities Natives face.

Many Native Americans, both in rural and urban settings, go to hospitals and clinics within the Indian Health Service (IHS), which is a sector of the Bureau of Indian Affairs. The aim of the IHS is to provide Native Americans enrolled in federally recognized tribes quality healthcare, yet it is severely underfunded. Mary Smith, a former principal deputy director of the IHS, writes that in order to receive the same level of care that federal prisoners receive, funding for the IHS would need to double, and it would need to be even higher to reach the same coverage that Medicaid provides (Smith, "Native Americans: A Crisis in Health Equity"). With this in mind, it is unsurprising that maternal healthcare services are rare within the IHS clinics. IHS clinics can serve as accessible forms of healthcare, yet 75% of Natives go to non-IHS healthcare centers for giving birth (Hassanein, 2022). Considering that only 0.4% of physicians are

Native American, when Natives go to non-IHS health centers, there is a low chance of seeing a provider who shares a cultural background with them. This can alienate Native people who are seeking care, and potentially lead to medical discrimination (AAMC, 2018).

Looking at the Missing and Murdered Indigenous Women (MMIW) crisis in conjunction with these health disparities reveals the connection between the crisis and the current health outcomes for pregnant Native women. According to the U.S. Department of the Interior, Native Americans are 2.5x more likely to experience violent crimes and 2x more likely to experience rape or sexual assault when compared to all other ethnicities (U.S. Department of the Interior, 2019). When looking at the violence against Native women in particular, the numbers get higher. Native women are 10x more likely to be murdered in comparison to any other race or ethnicity, and murder is the 3rd highest cause of death for the group (Bachman, R, 2008.; Urban Indian Health Institute, 2016). A recent study published in the National Library of Medicine found that homicide during pregnancy and shortly after is the leading cause of maternal mortality in the United States by more than twofold (Wallace, Maeve et. al, 2021). Since Native women are facing such high rates of homicide in general, it is likely that they are disproportionately impacted by homicide during pregnancy as well. However, Native American maternal mortality data for homicide and suicide consistently include small samples and often categorize these deaths in an "Other" racial category, which makes targeted Native data analysis not possible at this time (Heck, Jones, et al., 2021). More research on pregnancy-associated deaths from homicide and suicide within Native communities is imperative to understanding this crisis' impact on pregnant Natives. The Missing and Murdered Indigenous Women (MMIW) crisis is already a dejecting public health situation on its own. Looking at the MMIW crisis in tandem with the Native American maternal health disparity allows for a fuller picture of what is occurring to Native mothers. We need to not only examine American healthcare systems, but also policy to see how Native mothers are being discriminated against and harmed.

Traditional Indigenous wellness practices & the impact of colonialism

Traditional practices were banned from the community when Native American religious and healing ceremonies were prohibited by the Code of Indian Offenses starting in 1883 (Rules Governing the Court of Indian Offenses). Traditional ceremonies were banned from our communities, and anyone who tried to continue these practices was put in prison (Rules Governing the Court of Indian Offenses). The longstanding impact of this racist policy lasted all the way until the American Indian Religious Freedom Act, a law that allowed Natives to once again practice their healing and religious ceremonies without repercussion, which was implemented as recently as 1978 ("Public Law 95-341"). After being prohibited from conducting traditional health practices, Native Americans were given subservient medical care. This limited access to adequate care, the banning of traditional wellness practices, and colonialism imposed through genocide and forced sterilization of Natives have severely harmed the health of the community.

Before colonialism stripped Indigenous communities of their traditional wellness practices, they relied on a holistic form of care that is community oriented. Many aspects of this type of care continue to live on despite efforts to eradicate Native Americans. It is important to note that Indigenous communities and their wellness practices are not a monolith. Each culture is unique and diverse as are their medicines. Traditional practices cannot be generalized, making community-specific interventions essential. We can learn from specific communities about how uplifting traditional practices can impact maternal health outcomes.

While there are many diverse traditional practices, many of them across communities approach health from a holistic lens that differs from Western approaches to medicine. Many traditional Indigenous medicinal practices span physical, mental, emotional, and spiritual wellness (Struthers, et. al., 2004). As Diné (Navajo) Nurse Midwife Nicolle Gonzales explains in an interview, traditional wellness is not just deciding to go to the doctor and visit a clinic. It is a lifestyle and ongoing relationship with your provider (Gonzales, 2023). These traditional forms of care rely on an intimate relationship built on trust between the provider and patient. As Gonzales further elaborates in the interview, you cannot just "wake up one day and say I want to have a traditional ceremonial birth" (Gonzales, 2023). It requires work to build a trusting relationship between the midwife, the doula, other helpers, and the patient. Researching what kinds of traditional practices you want to include, whether that is herbs or songs or something else, takes preparation. This trust and support also spans the overall community. Birth requires preparation from the entire community, and they collectively care for the expectant mother (Gonzales, 2015). Within many Southwestern Indigenous communities, birth is not solely a medical process. Rather, birth is a sacred process and ceremony of welcoming new life into the world (Gonzales, 2015).

Across the Southwest, there are numerous types of traditional birthing practices among tribes ranging from ceremony to herbal and natural medicines. Within the Diné tradition in particular, the Blessingway ceremony provides the mother with spiritual strength and welcomes the new baby into the world. This ceremony is described as "a re-enactment of the creation. The Navajo believe they are performing the very songs and rituals that the gods used to bring about creation." (Hartle-Schutte, 1988). The ceremony involves songs, chants, traditional stories, and takes place in the traditional Diné home called the Hogan. During the birth, the medicine man recites:

> "The Early Dawn found a baby
> To the East, he found a baby;
> When he had found the baby
> He spoke to the baby;
> The baby heard him.
> When he spoke to the baby
> The baby was eager to be born.
> The baby has a happy voice
> He is an Everlasting and Peaceful baby"
> (Wyman, 1970; Begay, 1985)

These comforting words welcome the baby to the world in a loving, positive way. In their University of California: Berkeley dissertation, Begay describes the Blessingway ceremony as something to:

"bring the pregnant woman and her family into a symbolic identification with their ancestors; to the traditional Holy People and to the universal forces of life. This means that in giving birth to a new person, she is spiritually joined to both the past and the future. Through the words and chants of the Singer, she is made to feel these spiritual connections. This ceremony brings peace and spiritual strength to mothers who go through it." (Begay, 1985)

Ceremony brings comfort in a way that spans beyond what current standards of Western medicine provide. While Western forms of medicine have innovated maternal care, cultural and spiritual gaps remain for Indigenous patients that incorporating ceremony can fill.

A Case Study in Integrating Indigenous wellness practices and Western medicine

The undoing of colonialism through the reclaiming of traditional healing and cultural practices can begin to heal historical and modern traumas imposed upon Native women. A maternal health center dedicated to integrating traditional Indigenous and Western healthcare currently serves Native communities in the Southwest. This maternal health clinic is the first and only of its kind to integrate traditional Native healing practices and Western maternal care in the United States. Other efforts to integrate this type of care exist through organizations such as the Center for Indigenous Midwifery, Hummingbird Indigenous Family Services, Native American Health Center, some Indian Health Service Centers, and grassroots Indigenous doula and midwife groups. However, some of these organizations do not have a physical location, provide primary care services rather than specific maternal care services, and many of them have limited funding. Looking to the first clinic that integrates maternal care for Native peoples can help researchers understand how this unique form of care can aid Indigenous families, and highlight any issues that future initiatives can be prepared to address.

Gonzales is a Diné Nurse Midwife who started the "Changing Woman Initiative" (CWI), a non-profit organization that aims to mitigate maternal health disparities within the Native American community and provide expectant mothers with culturally integrated women's healthcare. The "Changing Woman Initiative," founded in 2018, is named after a revered figure in Diné stories: Asdzáá Naadleehi (Changing Woman), who is the creator of the Diné. The organization strives to revive traditional wellness practices and uphold the matriarchal values of many Southwestern tribes. Currently, CWI is providing education on traditional Indigenous midwifery, homebirth services, and an easy-access women's health clinic.

In an interview, Gonzales states that creating an integrated form of birth comes with unique challenges. She explains:

"One is (that) some people are not aware of what their traditional birthing practices are. Two, there are a lot of Tribes that are in the Southwest, but also, if you live in an urban area, (...) you see people from all over, so you can't just (...) integrate just one traditional birthing practice. You kinda have to honor all of them, and every community has different teachings."

Community-specific practices are integral to a "traditional" birth, but they are not always accessible to the patients CWI serves whether that is due to the patient living in an urban area or not having community knowledge passed down to them. Having a clinic that honors a wide representation of the local Indigenous communities requires knowledge of many different teachings, which can be difficult to accurately deliver. Despite these issues, Gonzales notes that she has seen miracles and the healing of trauma within these sacred spaces (Gonzales, 2023). Providing culturally competent and integrated care to Indigenous patients provides service that extends beyond maintaining the body's health. It provides holistic healthcare that spans Indigenous women's physical, emotional, mental, and spiritual health.

Gonzales emphasizes the uniqueness of what Indigenous women need within birthing. Due to historical and recent traumas, relationship violence, and the extraction of their resources, Native women need unique forms of support during birth. Movements surrounding maternal health justice sometimes group all racial communities together in an effort to encompass every community's disparities. We can learn from one another's stories and strategies, however, "centering Indigenous women has to be a focus for the programs that are meant to serve them" (Gonzales, 2023). Gonzales emphasizes that the needs of Indigenous women are unique and must be addressed as such due to the nature of colonial traumas, differing healthcare systems, and the loss of traditional lands, practices, and identity. Both the traumas Indigenous women continue to endure and the health disparities among Native communities as a whole contribute to these unique needs.

Unfortunately, many Native American women come to the CWI clinic with preexisting health conditions, which leads to around 57% of them needing to transition into a hospital setting (Gonzales, 2023). Gonzales envisions a world in which Indigenous women can go through a traditional birth if they want to, but states, "That's the vision that we hope for, but not everyone gets that. We get some very sick women who get sick during their pregnancy who need to go to the hospital." The widespread health disparities among Native communities create an obstacle to traditional births since extra medical support may be necessary for people with preexisting health conditions. As an example, Native Americans have high rates of chronic diseases such as diabetes that require extra precautions when someone delivers a baby ("Chronic Disease Resources for Tribal Health," 2023). The current healthcare system has failed Native American communities in many different aspects of care. So much so, that it is preventing Native people from being able to give birth in ceremony, suppressing many Native people from practicing cultural teachings surrounding birth. Incorporating clinicians experienced with working with Native communities into these integrative clinics could be a method of mitigating medical risk. Balancing when to bring in doctors to provide support without overshadowing the values and community practices the expectant parent wants is essential for imagining future integrative care.

Bringing Ceremony to Clinics and Hospitals

Integrating traditional Indigenous birthing practices and Western medicine has the potential to mitigate maternal health disparities among Native women due to their holistic and community-based approaches. Instead of a cold room with unfamiliar people and being engulfed in the smell of a hospital waiting to be examined and

prodded at, it is possible for Native women to be surrounded by community members and the comforting scent of sage smudge while preparing to have a birthing ceremony. Integrated care can be a reality. In fact, the World Health Organization has affirmed the efficacy of traditional healing practices and called for increased access to this type of care within typical Western medicine ("Legal status of traditional medicine and complementary/alternative medicine : a worldwide review," 2001).

Traditional ceremonies can work towards healing trauma and revitalize culture, and they also highlight the need for extra health support for Native women. If traditional models of care can be incorporated into hospitals that serve Indigenous communities, the concerns of not being able to receive critical care while in ceremony may be mitigated. Currently, some IHS hospitals allow traditional Native practices to take place, and it is common to find Nurse-Midwives working in collaboration with obstetrician-gynecologists. Additionally, in 2024, Medicaid began covering traditional ceremonies across four states, paving the way for increased acceptance and integration of Indigenous health practices in clinics and hospitals (McClurg, 2024). Currently, there is little research on how integrative care impacts Indigenous communities, yet the current findings are that integrative care promotes health equity, improves physical and mental health symptoms, reduces substance use, improves education and employment status, and decreases involvement with the criminal justice system (Horowitz, 2012; Lewis, 2017). Researchers are confirming the perception that connection to one's culture and community enhances health.

Bringing ceremonies to hospitals can raise issues of altering hospital policies and carrying out ceremonies in a non-traditional setting. If in a hospital, place-based ceremonies, like the Blessingway, would not be conducted in the most traditional way. Compromises may need to occur if this integrated medicine is expanded into Western medicine. When blending these two worlds, it is important to keep elders and knowledge keepers at the forefront of the integration of these traditions into clinical practice to keep our ceremonies sacred and respectfully implemented. Evaluating how to balance keeping practices traditional while also recognizing the limitations of the Western medical system needs to be further explored. Furthermore, research on the efficacy of integrative care for Native communities in the US needs to be conducted.

Conclusion

Integrating traditional birthing practices into healthcare for Native peoples can serve as a conduit for cultural healing from historical and current traumas, but there is a grave need for systemic change in healthcare that serves Native peoples. Researching and identifying the public health disparities among Native communities, and specifically Native women, is essential to bring healing to Native American mothers. Birth is sacred, and it is how we as Indigenous people ensure that our medicines, ceremonies, and traditions carry on. If we revitalize birth, then we can help ensure that new generations of healthy Native children can enter this world as a miracle against the colonialist systems that tried to eradicate us and grow up to thrive.

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Where Sympathy Falls Short: British Evangelical Abolitionism

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During the late eighteenth century, British abolitionists often invoked religion in their rhetoric against the slave trade. Evangelical abolitionists warned that God would impose a providential retribution on all of Britain for its complicity in the ungodly abuses of enslaved Africans. Within their providential language was the appeal to sympathy, namely images of bodily pain. Among the most vocal evangelical abolitionists were poets, such as William Cowper and Anna Laetitia Barbauld. This paper focuses on Cowper's "The Negro's Complaint" (1788) and Barbauld's "Epistle to William Wilberforce, Esq., on the Rejection of the Bill for Abolishing the Slave Trade" (1791). Cowper's and Barbauld's poems embody quintessential features of evangelical abolitionist rhetoric: appeals to Providence and sympathy. In this paper, I will examine how Cowper's and Barbauld's use of providential and sympathetic language advanced the abolitionist cause in the eighteenth century and whether their rhetoric holds up today.

Introduction

On April 18, 1791, William Wilberforce spoke in front of the House of Commons to introduce a bill abolishing the transatlantic slave trade. According to the Parliamentary Paper published on that day, Wilberforce opposed his fellow MPs' suggestion for "gradual abolition" on the grounds that "The Divine law against murder was absolute and unqualified, and precluded, with him, every consideration of expediency."[1] Wilberforce's speech epitomized the British evangelical abolitionist movement of the late eighteenth century: central to it was its belief in judicial providentialism—that divine Providence would collectively punish Britain for continuing the sins of the slave trade. Within this language of judicial providentialism was the invocation of feeling, present in Wilberforce's opening that stated, "he should not presume to determine what, upon the present occasion were the emotions and sentiments of others."[2]

Evangelical abolitionist poetry, such as William Cowper's "The Negro's Complaint" (1788) and Anna Laetitia Barbauld's "Epistle to William Wilberforce, Esq., on the Rejection of the Bill for Abolishing the Slave Trade" (1791), mirrored Wilberforce's rhetoric. Cowper's "The Negro's Complaint" condemns the dehumanization of enslaved Africans from a slave's perspective. Barbauld's "Epistle" was written in direct response to Parliament's rejection of Wilberforce's bill in 1791. It warns of the unavoidable downfall of the British as a consequence of continuing the slave trade. Both texts condemn the ungodly abuses of the slave trade through their appeals to human sympathy and the religious public's fear of God. What I will argue in this paper is that Cowper's and Barbauld's flawed appeals to sympathy expose the barriers that white abolitionists faced in advocating for enslaved Africans.

Origins of Evangelical Abolitionism

Evangelical abolitionism drew from various features of evangelicalism. Modern scholars follow David Bebbington's definition of evangelicalism—a movement started in 1734 that stresses the Bible, the cross, activism (the preaching of the gospel), and conversion from being a less devout to being a more devout Christian.[3] According to Randall Balmer, evangelicals especially emphasize the conversion principle because it is part of the "born again" experience (being reborn as a more devout Christian) that grants people access to heaven.[4] They see the Bible as "God's revelation to humanity" and are "inclined . . . to interpret the Bible literally."[5] Evangelicalism is not specific to one denomination; rather, it arose in multiple denominations and sects on the common ground of these four principles.[6] Ian M. Randall argues that evangelicalism is a "distinct stream of Christianity" because the "heart" of it is the "lived experience" that requires actively cultivating a "personal relationship with Christ."[7] Evangelicals viewed sin as a form of bondage; they understood the importance of liberation from enslavement because, to them, it resembled liberation from sin. However, unlike later evangelicals like Wilberforce, early evangelicals focused on the Africans' spiritual welfare rather than on abolishing slavery or the slave trade.[8] Few early evangelicals were involved in politics, and they lacked prominence or a unifying structure. During the period from 1788 to 1807, however, many evangelicals gained importance in society and politics.[9] The Clapham Sect—a group of

evangelicals based in Clapham, near London—led the abolitionist movement in Parliament. The Teston Circle—based in Teston, approximately 40 miles southeast of London—shared the evangelicals' concerns over slavery. Wilberforce was involved in both groups, especially the Teston circle. Barham Court, a principal estate in Teston, served as the headquarters for evangelical abolitionism, where Wilberforce and the abolitionist author Hannah More worked until 2 a.m. every night before Wilberforce introduced the first motion for abolition to Parliament in 1789.[10]

Judicial Providentialism in Evangelical Abolitionist Rhetoric

One of the key features of the evangelical movement in the late eighteenth century, driven in part by the aftermath of the American Revolution, was judicial providentialism. Evangelical abolitionists from 1788 to 1807 drew on the concept of judicial providentialism: the belief that God punished and rewarded nations in accordance with their moral character.[11] The American Revolution that began in 1776 and ended in 1783 with a British defeat escalated fears of divine punishment in Britain because many evangelicals, such as Granville Sharp, believed that the unrest in America represented God's punishment for the Britons' continuation of the slave trade. For example, Sharp's *The Law of Retribution* (1776), written shortly after the Americans declared independence, warned of a "severe National Retribution" for "the monstrous load of Guilt which the British subjects, on each side of the Atlantic, have incurred."[12] He argued that God's punishment was "particularly leveled against *Oppressors*, *Tyrants*, and *Slave-holders*!"[13] Sharp's warning of divine punishment on all British people for the slave trade reflected the nature of collective blame in judicial providentialism that circulated Britain.

Cowper and Barbauld were two notable evangelical abolitionist authors whose works embodied judicial providentialism. Cowper was born on November 16, 1731, in Great Berkhamsted, Hertfordshire, England, and died on April 25, 1800, in East Dereham, Norfolk. In his works, he wrote about the joys and sorrows of everyday life, using language that was simple compared to that of his contemporaries, including Samuel Taylor Coleridge, Robert Burns, and William Wordsworth.[14] In 1767, Cowper and his friend Mary Unwin moved to Olney where he met John Newton, who became his close friend. Cowper was inspired by Newton's story of converting to "real Christianity" after working as a slave trader for 11 years. Like Sharp, Cowper saw the American Revolution as a punishment inflicted on the Britons for turning away from God both individually and collectively. Though his *Moral Satires,* written between 1779 and 1782, did not touch on the issue of slavery, they promoted the idea of national guilt by citing Old Testament examples of God punishing sinful nations.[15] Barbauld was a British poet, writer, and editor born on June 20, 1743, in Kibworth Harcourt, Leicestershire, England; she died on March 9, 1825, in Stoke Newington, near London. She lived in Warrington, Lancashire, from the ages of 15 to 30, where her father taught at a Nonconformist Protestant academy. In 1774, she married French Protestant clergyman Rochemont Barbauld. Anna Laetitia Barbauld is known for her hymn "Life! I Know Not What Thou Art" as well as her poems "Corsica" (1768), "The Invitation" (1773), and "Epistle" (1791). She also edited William Collins's *Poetical Works* (1794) and later wrote introductions to a fifty-volume series of iconic British novels, *The British Novelists* (1810).[16]

Cowper's and Barbauld's Use of Judicial Providentialism

Cowper's "The Negro's Complaint" embodies judicial providentialism because it predicts a divine punishment of the British for the slave trade. In "The Negro's Complaint," Cowper warns of divine punishment in the form of a natural disaster:

> "Hark! He answers!—Wild tornadoes
> Strewing yonder sea with wrecks,
> Wasting towns, plantations, meadows,
> Are the voice with which he speaks.
> He, foreseeing what vexations
> Afric's sons should undergo,
> Fixed their tyrants' habitations
> Where his whirlwinds answer—'No.'"[17]

Cowper grounds his image of the divine punishment in nature, characteristic of late-eighteenth-century evangelicalism. In the wake of "the Great Enlightenment Earthquake Controversy" of the 1750s, many late-eighteenth-century evangelicals viewed natural disasters as signs of divine intentions.[18] For example, Cowper's *The Task* (1785), written after Britain's 1783 defeat in the American Revolution, portrays the Sicilian earthquake of 1783 and other similar natural disasters as "frowning signals" that "bespeak / Displeasure in his breast who smites the earth."[19] In "The Negro's Complaint," Cowper attributes "Wild tornadoes" to God, confirming that "He answers" to the "vexations / Afric's sons should undergo." He characterizes this punishment as inevitable because it is "Fixed" and aimed at "their tyrants' habitations."[20] Cowper's depiction of God using "Wild tornadoes" and "whirlwinds" to punish the British for the slaves' "vexations" aligns with the evangelical belief that God used nature to punish immoral nations.

Barbauld's "Epistle" similarly warns of a divine punishment for the Britons' immorality in the slave trade. In "Epistle," Barbauld foretells the slaves' revenge on Britain for the slave trade:

> "In Britain's senate, Misery's pangs give birth
> To jests unseemingly, and to horrid mirth–
> Forbear!–thy virtues but provoke our doom,
> And swell th' account of vengeance yet to come;
> For, not unmarked in Heaven's impartial plan,
> Shall man, proud worm, contemn his fellow-man?
> And injur'd Afric, by herself redrest,
> Darts her own serpents at her Tyrant's breast.
> Each vice, to minds deprav'd by bondage known,
> With sure contagion fastens on his own;
> In sickly languors melts his nerveless frame,
> And blows to rage impetuous Passion's flame:
> Fermenting swift, the fiery venom gains
> The milky innocence of infant veins;
> There swells the stubborn will, damps learning's fire,
> The whirlwind wakes of uncontroul'd desire,
> Sears the young heart to images of woe,
> And blasts the buds of Virtue as they blow."[21]

Barbauld's warning that Providence would punish Britain for its national immorality reflects the evangelical abolitionists' implication of all Britons in the slave trade. The evangelicals' rationale for blaming Britain as a whole was that every Briton was responsible for the slave trade.[22] Although Barbauld acknowledges that Parliament is where "Misery's pangs give birth / To jests unseemly, and to horrid mirth," the voting public's choice to elect the MPs who continue this evil makes its members just as immoral as Parliament. Therefore, her juxtaposition of "Misery" with "jests" and "mirth" conveys the sadism of both the MPs and the people who elected them, suggesting that they take pleasure in continuing the abuses of the slave trade. Barbauld's characterization of British minds as "deprav'd by bondage known" supports the evangelicals' blame of all Britons for the slave trade: while only a few adult men voted for the MPs who rejected Wilberforce's bill, all Britons were corrupted by slavery because they indulged in the products of the slave trade.[23] The phrase "bondage known" conveys the Britons' willful perpetuation of the slave trade that they "know" is horrific, as they have heard Wilberforce's protests. The reason why they continue trafficking slaves is that slavery "Sears the young heart to images of woe": the Britons' hearts become hardened as they become accustomed to abusing their slaves.[24] The word "Sears" refers to both the Britons' desensitization as well as the branding of slaves; through this double meaning, Barbauld illustrates how the same act of cruelty burns slaves, slave traders, and consumers of the slave trade. This motif of burning extends throughout "Epistle" as Barbauld criticizes the Britons' "Avarice" and "impetuous Passion's flame," which is what precisely "Sears the young heart."[25] She then goes on to call Britain a "voluptuous" and "shameless" nation.[26] Barbauld's description of Britain as "voluptuous" and "Sear[ed]" by "impetuous Passion's flame" implies that the Britons' overwhelming emotion, probably greed or gluttony, has replaced their dignity with self-indulgence.[27] This assertion aligns with the evangelicals' argument that Britons prioritized indulging their desires for slave-produced goods over their morality.

The Eighteenth-Century Concept of Sympathy

The couching of judicial providentialism in the language of bodily suffering brings it together with the developing concept of sympathy. According to Amit S. Rai, during the eighteenth century, there was an increasing concern with sympathy and the contemplation of pain and pleasure.[28] Sympathy in the eighteenth century was named a "relation between two bodily organs or parts such that disorder, or any condition, of the one, induces a corresponding condition in the other."[29] This concept of sympathy grounded its traditional definition—a connection in which certain things affect each other—in the body.[30] Abolitionist discourses often involved scenes of suffering and the pained body; the body tied sensations of pain to the "sympathetic response."[31] Markman Ellis argues that sentimentalists' fascination with pain and suffering formed the moral foundation of the abolitionist movement.[32] Methodist preacher John Wesley's *Considerations Upon Slavery* (1774) ties together sympathy, the body, and evangelical morality: "Are you *a man*? Then you should have a *human* heart...Do you feel no relenting now? If you do not, you must go on, till the measure of your iniquities is full. Then will the great GOD deal with *you*, as you have dealt with *them*, and require all their blood at your hands...."[33] Wesley's statement that "*a man*" should have a "*human* heart" names the heart as the

organ of sympathy. He integrates rhetoric of bodily pain with judicial providentialism in warning that "the great GOD" will "require all their [the slaves'] blood at your [the Britons'] hands." Similarly, Ottobah Cugoano and Olaudah Equiano, former slaves who chronicled their experiences, used the language of suffering to morally obligate readers to sympathize with enslaved Africans. In *Thoughts and Sentiments* (1787), Cugoano vividly describes the "bloody whip" that "lath[es]" the "naked bodies" of slaves to convince readers of the evils of the slave trade.[34] In *Interesting Narrative* (1789), Equiano recounts his suffering as a slave and ends with a demand for "sympathy for the wants and miseries of [his] sable brethren."[35]

Sympathetic Language in "The Negro's Complaint" and "Epistle"

Cowper's sympathetic language in "The Negro's Complaint" highlights the suffering of the enslaved. Cowper writes "The Negro's Complaint" from a slave's perspective and combines religious and bodily language to convey the grievances of the enslaved. For example, his speaker asks, "Why did all-creating nature / Make the plant for which we toil?"[36] The word "toil" conveys the physically painful labor that slaves had to do, and the speaker's question of why God would make slaves suffer like this aims to draw sympathy by appealing to faith. Cowper further emphasizes the immorality of the slave trade when he implores the British to "Think how many backs have smarted / For your sweets the cane affords."[37] His use of the word "your" in "your sweets" directly blames the Britons' desire for sugar on the pain caused to the "backs" that "have smarted." The juxtaposition of "sweets" with the image of slaves' "backs...smart[ing]" appeals to the senses of taste and touch, respectively, to show the consequence of Britons indulging in sugar. The alliteration of "smarted" and "sweets" creates unity and establishes a causal relationship between the demand for sugar and the abuses involved in meeting that demand. Cowper creates a similarly unified contrast through the dual meaning of "cane" which symbolizes both sugarcane and the whips used on enslaved Africans, adding to the juxtaposition of sweetness and pain.

In contrast, Barbauld's sympathetic language centers on the painful effects of divine punishment on the Britons. Barbauld foretells of a rebellion where "injur'd Afric... / Darts her own serpents at her Tyrant's breast." She warns that the British "worm" will pale in comparison to the African "serpents" whose "fiery venom gains / The milky innocence of infant veins." Barbauld offers no solution to this grim fate because the Britons' "doom" is part of "Heaven's impartial plan." Barbauld emphasizes the impending "doom" of the British in three ways: contrasting the grandeur of the African "serpent" with the diminutiveness of the British "worm," infantilizing the British, and surrendering the Britons' agency to Providence. Barbauld's use of the words "innocence," "infant," and "milky" (which is suggestive of breast-feeding), as well as her subjection of the British to "Heaven's impartial plan," portrays the British as helpless infants unable to defend themselves from Providence. Her inclusion of "infant[s]" in the divine punishment intertwines her sympathetic language with judicial providentialism because it emphasizes that even newborn Britons carry the sins of the slave trade. Through her depiction of the "fiery venom gain[ing] / The milky innocence of infant veins," Barbauld combines the vulnerability of the British "infant" with the pain of the body

absorbing the venom after a snake bite, making what Rai calls a "classic scene of sympathy: spectacle, gaze, suffering, representation, and call."[38]

Initial Reception of "The Negro's Complaint" and "Epistle"

Barbauld's invocation of slavery's danger for British national wellbeing represents a broader evangelical abolitionist appeal to nationalism along with the religious rhetoric. In January 1788, for example, the Society for Effecting the Abolition of the Slave Trade published a call to arms in every major newspaper to make abolition a national cause, which led to the House of Commons receiving more than 100 petitions for abolition.[39] Therefore, the Society's work attached a patriotic appeal to the abolitionist movement.[40] Cowper's "The Negro's Complaint" was received enthusiastically for fueling this patriotic appeal. Cowper set "The Negro's Complaint" to the tune of *Admiral Hosier's Ghost*, a war ballad composed from 1739-1740 during England's war with Spain. British audiences viewed this musical choice as restorative to British patriotism following the American Revolution; they saw Cowper's poem as part of the unification of Britons under the antislavery cause that reinforced their national identity.[41] In Christopher Leslie Brown's words, "The men and women who gave life to this movement originated the campaign in the process of pursuing a variety of ends, to cleanse their society of sin and corruption, to renew its power and dignity, or to prove themselves holy or worthy or brave."[42] To British abolitionists, Cowper's religious and patriotic appeal epitomized their multifaceted goal.

In contrast to the acclaim for Cowper's poem, abolitionists' praise of Barbauld's "Epistle" focused on its grounding in the slave trade's effect on the British. In the post-Cugoano and Equiano era, British audiences were used to hearing abolitionists condemn the brutality of the slave trade. Graphic depictions of slavery stopped resonating with them because they were frequently exposed to those images, which was why Wilberforce's 1791 speech did not sway the MPs. Barbauld recognizes this effect in "Epistle" when she says that the Britons' "hearts" are "Sear[ed]…to images of woe"; therefore, she focuses her poem on the harms that providential retribution would inflict on the British because it is the only way to resonate with them. This method of criticizing the slave trade wielded rhetorical significance because its unusual angle, coupled with its sympathetic and providentialist language, made abolition a more pressing cause for the British. Abolitionist authors recognized the literary power of Barbauld's British-oriented perspective: for example, in a letter to Barbauld about "Epistle," Hannah More praised Barbauld for "writing so well, for writing on a subject so near to my heart, and for addressing it to one so every way worthy of your highest esteem."[43] In *Women, Dissent, & Anti-Slavery in Britain & America*, Elizabeth J. Clapp, Julie Roy Jeffrey, and other historians recognize the reception of Barbauld's "Epistle" from her contemporaries, like More, as representative of the power of women Dissenters using their faith to challenge slavery through literature.[44]

A Modern Critique of Cowper's and Barbauld's Poems

While the enthusiastic response to "The Negro's Complaint" showed the power of abolitionist poetry in the eighteenth century, today, Cowper's choice to write from a slave's perspective as a white man demonstrates shortcomings in his advocacy for slaves. As a white British man, Cowper takes on the role of an enslaved African in writing "The Negro's Complaint." According to Lynn Festa, at the time of its publication, orators reciting the poem were most likely to be white and British. Festa writes, "The invitation…to 'be' the slave for the space of a song…asserts a possible equity or exchange between the intradiegetic and extradiegetic speakers of the poem. And yet the British speaker must confront the knowledge that his or her place is more properly with the accused 'you' rather than with the accusing 'I.'"[45] When the British orator complains on behalf of Cowper's enslaved speaker, thereby temporarily assuming the role of an enslaved African without shedding their British identity, they are essentially acting. This tension within the orator's identity raises the question of whom the grief belongs to because the orator juggles between their own identity and the enslaved speaker's.[46] Because the British orator is not an enslaved African, the most that they can do is act as one for the duration of the poem; they cannot transform themself into a slave. Since the orator can only pretend to be a slave for a momentary performance, Cowper's choice to write from a slave's perspective fails to create a speaker who truly embodies the enslaved experience.

The treatment of "The Negro's Complaint" as an acting performance exemplifies Festa's overarching claim that white abolitionists who tried to use sympathy to convey the horrors of the slave trade nonetheless ended up objectifying enslaved Africans. For example, when testifying in front of the House of Commons, the surgeon of the slave ship *Brookes*, Dr. Trotter, said that he saw slaves "drawing their breath with all those laborious and anxious efforts for life, which is observed in expiring animals…crying out, 'Kickeraboo, kickeraboo.'"[47] Despite his attempts to draw sympathy through the phrases "laborious and anxious efforts for life" and "crying out," Trotter's reduction of slaves to "expiring animals" that call out "kickeraboo" dehumanizes them in the same manner that slave traders did.

Although Cowper avoids Trotter's animalization by recognizing the "human feelings" of enslaved Africans, his choice to title his poem "The Negro's Complaint" inadvertently objectifies them.[48] The word "The" rather than "A" makes the speaker assume the identity of all Africans rather than acknowledging himself as one individual, which characterizes Africans as one homogenous race. In contrast, Cugoano's *Thoughts and Sentiments* and Equiano's *Interesting Narrative* emphasize their unique experiences as enslaved Africans; as a result, their stories feel human because they are personal to them. While Cowper recognizes the "human feelings" of enslaved Africans, his characterization of Africans as a single mass of people erases slaves' individuality, depersonalizing their suffering.

Similarly, while Barbauld's centering of her sympathetic rhetoric on the Britons' suffering was powerful in eighteenth-century Britain, from a modern perspective, the grounding of her argument in British self-interest displays her struggle to advocate for slaves themselves. Barbauld's comparison of "bondage" to the "deprav[ement]" of the British mind equates the physical pain inflicted on enslaved Africans to the collapse of British morality, erasing the distinct nature of the Africans' suffering. Unlike other abolitionists, like Cugoano and Equiano who provide evocative images of African suffering, Barbauld emphasizes the pain of British bodies absorbing the venom of African serpents during a slave revolt. Thus, her sympathetic appeal to the religious public's

fear of God is grounded in the threat that a collective divine punishment poses to the Britons' self-interest. Rather than trying to make the public feel sympathy toward the pain of enslaved Africans, Barbauld appeals to their fear of the deep pain that Providence would inflict on them. Barbauld's inability to center her rhetoric on slaves reflects her background as a white woman who could not have fully understood the magnitude of suffering that slaves endured. While Barbauld's focus on the Britons' pain was fitting for a time when Britons were numbed to the horrors of slavery, from a modern point of view, her failure to advocate for slaves themselves, alongside Cowper's failure to recognize enslaved Africans as individuals, reflects how white abolitionists struggled to precisely represent the experiences of the enslaved.

Footnotes

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[22] Coffey, "'Tremble Britannia!'" 863.

[23] Barbauld, "Epistle," 47; Coffey, "'Tremble, Britannia!'" 863.

[24] Cowper, "The Negro's Complaint," 21; Barbauld, "Epistle," 55.

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NATURAL SCIENCES
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Comparative Nutritional Analysis of Neurospora Crassa-Derived Mycoprotein Bread and Conventional All-Purpose Flour Bread

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The rise in bread consumption across Asia, alongside carbohydrate-dense staples such as rice, has intensified dietary imbalances, particularly protein deficiencies. This study explores the potential of mycoprotein, derived from Neurospora crassa, to enhance the nutritional profile of bread. Mycoprotein, a sustainable fungal protein, is rich in high-quality protein and dietary fiber, offering a promising solution to nutritional gaps in carbohydrate-dominant diets. Bread formulations with varying levels of mycoprotein inclusion (0–40%) were analyzed for macronutrient composition, caloric distribution, and amino acid profiles. Results indicate a significant increase in protein content, from 8.13 g/100 g at 0% to 15.69 g/100 g at 40% inclusion, and dietary fiber, which rose from 1.7 g/100 g to 15.43 g/100 g. Concurrently, carbohydrate levels declined, demonstrating mycoprotein's potential to reduce glycaemic load. While essential amino acid profiles improved, certain amino acids, including methionine and cysteine, remained limited, suggesting the need for complementary protein sources. This research highlights mycoprotein's capability to address protein and fiber deficiencies while offering a sustainable alternative to conventional bread ingredients. These findings support its application in developing nutritionally enriched, environmentally friendly food products for regions experiencing dietary transitions.

Introduction

Asia's growing appetite for bread signals a profound shift in dietary habits, marked by an accelerating embrace of processed, convenience foods. In China, for instance, the bakery industry expanded by 26% between 2015 and 2020, driven by a growing demand for white bread [1]. Similarly, in Japan, household expenditure on bread surpassed that of rice for the first time in 2011, indicating a substantial departure from traditional dietary patterns [2]. As bread becomes a more integral component of daily food consumption across Asia, its nutritional composition—characterized by high carbohydrate and low protein content—has become a focal point of concern.

Excessive carbohydrate intake, particularly from refined grains such as those found in conventional bread, has been implicated in the etiology of several metabolic disorders, including obesity, insulin resistance, and an elevated risk of type 2 diabetes [3]. This issue is especially pronounced in many Asian populations, where rice, a staple with high carbohydrate density, already constitutes a significant proportion of the diet. The additional introduction of bread exacerbates this dietary imbalance, leading to a marked increase in carbohydrate consumption without addressing the population's protein requirements. Bread's inherently low protein content, when combined with a carbohydrate-heavy dietary framework, intensifies the existing challenge of protein insufficiency in these regions [4].

Protein is a critical macronutrient, essential for numerous physiological processes such as metabolic homeostasis, muscle protein synthesis, and tissue repair. Despite its importance, protein intake in many Asian countries remains suboptimal due to the dominance of carbohydrate-rich staples, such as rice and bread, in the diet [4]. This imbalance, characterized by excessive carbohydrate intake coupled with insufficient protein consumption, not only exacerbates the prevalence of metabolic disorders but also complicates efforts to mitigate chronic protein deficiencies—a nutritional concern that is projected to persist and even worsen in the coming decades.

In response to these emerging public health concerns, there has been a growing demand from consumers, alongside government-driven initiatives, to develop food products with enhanced nutritional profiles [5]. These trends have spurred research and development efforts aimed at reformulating bread products to increase their protein and dietary fiber content, with the goal of counteracting the negative health impacts associated with carbohydrate overconsumption and protein insufficiency in traditional bread formulations [5].

One promising approach to improving the nutritional quality of bread involves the incorporation of mycoprotein, a high-protein biomass produced from filamentous fungi, such as Fusarium, Neurospora, and Rhizopus spp. Mycoprotein offers several distinct nutritional advantages: it is rich in high-quality protein, contains a favourable amino acid profile, and is also a significant source of dietary fiber. Studies have demonstrated that mycoprotein can promote digestive health, enhance satiety, and support glycaemic control and weight management [6]. Furthermore, the production of mycoprotein is highly sustainable when compared to traditional animal-based protein sources, requiring fewer natural resources, such as land and water, and generating a substantially lower carbon footprint [7]. In addition to its high protein content, mycoprotein's minimal environmental impact thus positions it as a promising solution to intensifying global food challenges [7].

No	Protein Source	Type	CO2 Emissions
1.	Mycoprotein	Fungi	$1.5 \, kg \, CO_2$ per kg
2.	Peas	Grain legumes	$2.3 \, kg \, CO_2$ per kg
3.	Soy	Grain legumes	$2.8 \, kg \, CO_2$ per kg
4.	Chicken	White Meat	$6.9 \, kg \, CO_2$ per kg
5.	Tuna	Fish	$13 \, kg \, CO_2$ per kg
6.	Salmon	Fish	$15 \, kg \, CO_2$ per kg
7.	Pork	Red Meat	$24 \, kg \, CO_2$ per kg
8.	Beef	Red Meat	$31 \, kg \, CO_2$ per kg
9.	Lamb	Red Meat	$38 \, kg \, CO_2$ per kg

Table 1: CO2 Emissions of Different Protein Sources (Per Kilogram).

Research Objective

The present research aims to investigate the potential of mycoprotein as a novel ingredient in bread formulations to improve the overall nutritional profile of bread products. While mycoprotein's high protein and fiber content is well-documented, its application in bread remains underexplored within the context of nutritional enhancement. This study will examine how varying levels of mycoprotein incorporation can modify the macronutrient composition of bread, with a particular focus on improving protein content, optimizing the amino acid profile, and increasing dietary fiber levels. Furthermore, the impact of mycoprotein inclusion on the carbohydrate and fat composition of bread will be analysed.

Through a rigorous evaluation of these parameters, this research will provide comprehensive insights into the viability of mycoprotein as a functional ingredient in bread production, with the potential to contribute to improved public health outcomes by addressing the nutritional imbalances prevalent in many Asian diets.

Materials & Formulations

The experiment was designed to assess the effect of mycoprotein inclusion at varying levels on the nutritional profile of bread. Mycoprotein, derived from the filamentous fungi strain **Neurospora crassa** (Fig.1), containing approximately 35-40g of protein and 20-25g of fiber per 100g, was used to replace all-purpose flour in the bread formulations.

Initially, mycoprotein inclusion rates of 0%, 5%, 10%, 15%, and 20% were proposed; however, the design was revised to include higher levels for a more comprehensive assessment. The final inclusion rates of 0%, 10%, 20%, 30%, and 40% were selected.

Figure 1: *Neurospora crassa* derived mycoprotein powder

All samples included all-purpose flour, oil, salt, sugar, yeast, and water, with the water content adjusted based on a standardized parameter. Other minor ingredients, such as bread improver, calcium propionate, and gluten, were incorporated to support structure and shelf-life. The doughs were mixed, rested, proofed, and baked under standardized conditions.

No	Items	0% MYP	10% MP	20% MP	30% MYP	40% MP
1.	Mycoprotein (g)	0.00	31.00	62.00	94.00	124.8
2.	All Purpose Flour (g)	312.00	281.00	250.00	218.00	187.2
3.	Oil (g)	24.00	24.00	24.00	24.00	24.00
4.	Salt (g)	6.00	6.00	6.00	6.00	6.00
5.	Sugar (g)	31.00	31.00	31.00	31.00	31.00
6.	Yeast (g)	5.00	5.00	5.00	5.00	5.00
7.	Water (g)	168.00	168.00	168.00	168.00	168.00
8.	Bread Improver (g)	1.00	1.00	1.00	1.00	1.00
9.	Calcium Propionate (g)	2.00	2.00	2.00	2.00	2.00
10.	Gluten (g)	1.00	1.00	1.00	1.00	1.00
	Total (g)	550.00	550.00	550.00	550.00	550.00

Table 2: Formulations of Bread with Varying Mycoprotein Inclusion Levels. (Per 550g of bread)

Analytical Methods

Figure 2: Breads with mycoprotein inclusion from left to right: 0%, 10%, 20%, 30%, and 40%

The bread samples were sent to Bureau Veritas India, a lab accredited with National Accreditation Board for Testing and Calibration Laboratories (NABL) standards for comprehensive nutritional analysis in order to evaluate the impact of mycoprotein inclusion.

Protein content was measured using the Kjeldahl method, which involved the digestion of samples in acid to release nitrogen, followed by its measurement and conversion to total protein using a nitrogen-to-protein conversion factor.

The amino acid composition of the bread formulations was analysed using high-performance liquid chromatography (HPLC), enabling a precise and comprehensive profile of both essential and non-essential amino acids. This analysis was crucial for evaluating the protein quality of the formulations, particularly given the varying levels of mycoprotein inclusion.

Initially, a complete amino acid profile was planned for each formulation (0%, 10%, 20%, 30%, and 40% mycoprotein inclusion). However, it was determined that a composite analysis of the mycoprotein bread samples (10%, 20%, 30%, and 40%) would be more effective. This approach was chosen because individual analyses at lower inclusion levels would likely yield results below quantifiable limits (BQL) for several amino acids, limiting practical insights. In contrast, the composite analysis provided a robust and quantifiable amino acid profile, serving as a representative proxy for assessing protein quality across formulations.

The dietary fiber content was measured using an enzymatic-gravimetric method. This approach enabled the precise separation and quantification of fiber fractions within the bread samples.

Moisture content was determined using the oven-drying method, where the bread samples were heated at a constant temperature until no further weight loss occurred. This provided an accurate measure of the water content in the bread, which is important for understanding shelf life and texture. Fat content was determined using Soxhlet extraction, which involved dissolving the fat in an organic solvent and quantifying it by evaporation.

Carbohydrate content was determined by difference, subtracting the measured values of protein, fat, fiber, and ash from the total mass. In addition to total carbohydrates, the content and

profile of simple sugars was analysed separately using HPLC to allow for precise assessment of individual sugar components.

The sodium content was measured using atomic absorption spectrophotometry (AAS) or ion-selective electrode (ISE) analysis to determine the precise contribution of sodium from salt and other ingredients. Ash content, representing the total mineral fraction, was measured through gravimetric incineration at 550°C, allowing for precise quantification of inorganic materials in the bread.

Lastly, the total caloric content, calorific content from protein, calorific content from carbohydrates, and calorific content from fat was calculated based on the macronutrient composition, using standard conversion factors (4 kcal/g for protein and carbohydrates, and 9 kcal/g for fat), to provide an estimate of the energy content within the bread samples.

Results & Interpretation
Nutritional Composition

Parameters	0% Inclusion	10% Inclusion	20% Inclusion	30% Inclusion	40% Inclusion
Protein(g)	8.13±0.05	9.83±0.16	11.66±0.21	14.29±0.5	15.69±0.14
Carbohydrates(g)	56±0.01	53.66±0.47	50.33±0.47	47.33±0.58	45.33±0.47
Fat(g)	7.12±0.03	5.83±0.01	5.67±0.03	5.99±0.03	6.6±0.07
Sugars(g)	1.76±0.11	2.97±0.25	4.32±0.16	5.22±0.03	6.48±0.03
Fiber(g)	1.7±0.01	5.3±0.23	9.3±0.2	13.53 ± 0.1	15.43±0.3
Sodium (mg)	1.89±0.01	0.62±0.01	0.77±0.01	0.81±0.01	0.64± 0.01
Ash(g)	5.16±0.08	2.13±0.08	3.12±0.03	3.6 ± 0.01	3.59±0.01

Table 3: Nutritional Composition of Bread with Varying Mycoprotein Levels (per 100g of bread). The results are the calculated mean along with standard deviation (n = 3).

The nutritional analysis of bread formulations with incremental mycoprotein inclusion (0%, 10%, 20%, 30%, 40%) revealed distinct trends in protein, fiber, and carbohydrate content, indicative of mycoprotein's compositional influence.

Protein content exhibited a near-linear increase with rising mycoprotein inclusion, from 8.13 ± 0.05g/100g at 0% to 15.69 ± 0.14g/100g at 40%. This trend underscores mycoprotein's substantial protein density and suggests its efficacy as a concentrated protein source within the matrix. The proportional increase across inclusion levels indicates that protein contribution from mycoprotein is both consistent and scalable within the bread formulation.

Fiber content increased markedly with higher levels of mycoprotein, from 1.7 ± 0.01g/100g at 0% to 15.43 ± 0.3g/100g at 40% inclusion. Given mycoprotein's known high fiber content (~30%), this trend suggests effective retention and integration of dietary fiber within the bread matrix. The steep rise in fiber levels as inclusion increases reflects mycoprotein's potential as a primary fiber contributor that substantially alters the nutritional properties of the formulations.

Carbohydrate content demonstrated an inverse relationship with mycoprotein inclusion, declining from 56 ± 0.01g/100g at 0% to 45.33 ± 0.47g/100g at 40%. This decrease likely results from the displacement of carbohydrate-rich flour by mycoprotein, which has a comparatively low carbohydrate content. The downward trend indicates a dilution effect on total carbohydrates, suggesting that mycoprotein could support lower-carbohydrate formulations while maintaining nutrient density.

Fat content remained relatively stable across inclusion levels, with only minor fluctuations from 7.12 ± 0.03g/100g at 0% to 6.6 ± 0.07g/100g at 40%. The limited variation in fat content implies that mycoprotein inclusion does not significantly impact the lipid profile of the formulation, likely due to the low-fat content in mycoprotein itself. This stability suggests that fat levels are more dependent on the base ingredients in the formulation.

Sugar content showed a gradual increase with higher mycoprotein inclusion, from 1.76 ± 0.11g/100g at 0% to 6.48 ± 0.03g/100g at 40%. This trend may be attributable to the intrinsic sugars in the mycoprotein itself or interactions that elevate sugar content during processing. This increase in sugars with rising mycoprotein levels warrants further analysis to understand the underlying cause, especially given its potential implications for flavour and glycaemic load.

Ash content decreased from 5.16 ± 0.08g/100g at 0% inclusion to 3.59 ± 0.01g/100g at 40% inclusion. This reduction likely reflects a shift in the mineral composition as all-purpose flour, which has a standardized mineral content, is progressively replaced with mycoprotein.

Lastly, sodium content remained low across most inclusion levels, with an unexpected peak of 0.81 ± 0.01 mg/100g at 30% inclusion, possibly due to variations in processing or inherent sodium content in the mycoprotein used to make this particular formulation.
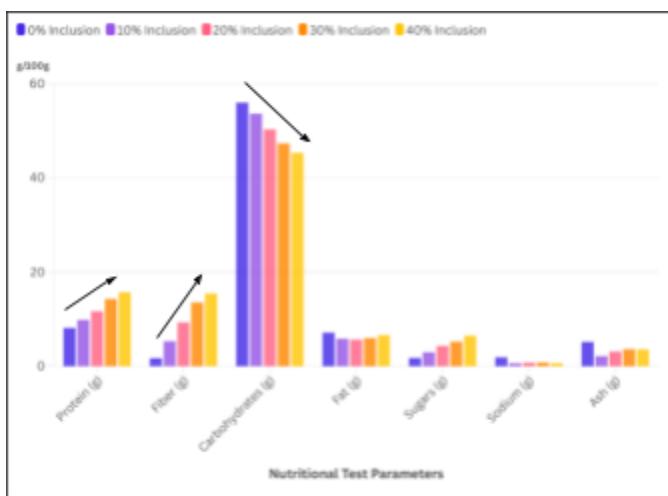
Figure 3: Nutritional Composition of Bread with Mycoprotein Levels (per 100g)

Calorific Distribution

The caloric distribution diagram demonstrates a clear shift in macronutrient contributions to total calories as mycoprotein inclusion increases. Calories from protein rise progressively, reflecting mycoprotein's substantial protein content, while calories from carbohydrates decrease, indicating a reduction in carbohydrate density as more mycoprotein replaces flour. Calories from fat remain relatively constant, suggesting that fat content is largely unaffected by mycoprotein levels. These results are in accordance with earlier mentioned observations.
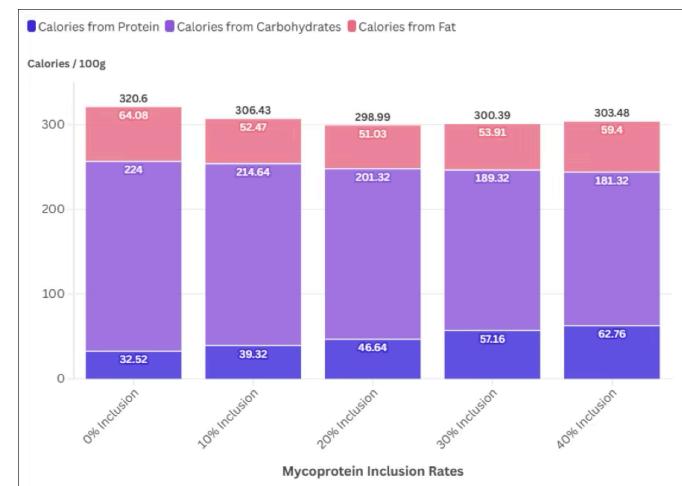
Figure 4: Caloric Distribution in Bread with Varying Mycoprotein Inclusion Levels (per 100g)

Representative Amino Acid Profile of Composite Bread Formulation

The composite amino acid profile of the mycoprotein-enriched bread formulation shows a total amino acid concentration of 10.65g per 100g, which represents a moderate level for a bread product. For comparison, conventional white bread contains approximately 7.61g of total amino acids per 100g [22], highlighting the enhanced amino acid content in the mycoprotein-enriched formulation.

Elevated levels of glutamic acid (2.526g/100g) and aspartic acid (0.636g/100g) are observed, both of which are commonly abundant in fungal-based proteins and these quantities align with the typical amino acid profile of fermented protein products [13]. Several other essential amino acids, including threonine (0.306g/100g), valine (0.428g/100g), isoleucine (0.382g/100g), and leucine (0.609g/100g), are also present in moderate amounts. These amino acids are essential for human health, and their presence in meaningful quantities suggests that the mycoprotein-enriched bread provides a promising essential amino acid profile.

The presence of these essential amino acids in significant quantities suggests that the mycoprotein-enriched bread could potentially contribute meaningfully to dietary protein quality by providing the building blocks necessary for various physiological functions.

However, methionine (0.140g/100g), tryptophan (0.076g/100g), and cysteine (0.290g/100g) are present at relatively low levels. Their low concentrations suggest that

additional protein sources might be required to achieve a fully balanced amino acid profile. The above composition thus indicates that while mycoprotein-enriched bread significantly contributes to protein and essential amino acids, supplementing it with complementary proteins would be required to further optimize the amino acid profile and better fulfil dietary requirements.

Test Parameters	Results	Unit
Aspartic Acid	0.636	g/100g
Glutamic Acid	2.526	g/100g
Serine	0.375	g/100g
Histidine	0.27	g/100g
Glycine	0.418	g/100g
Threonine	0.306	g/100g
Alanine	0.289	g/100g
Arginine	0.63	g/100g
Tyrosine	0.258	g/100g
Cysteine	0.29	g/100g
L-Valine	0.428	g/100g
Methionine	0.14	g/100g
Phenylalanine	0.47	g/100g
Isoleucine	0.382	g/100g
Leucine	0.609	g/100g
Lysine	0.466	g/100g
Proline	0.659	g/100g
Tryptophan	0.076	g/100g
Total Amino Acids	10.65	g/100g

Table 4: Amino Acid Profile of Mycoprotein- Enriched Bread Formulation (g/100g)

The moisture content of the bread formulations increased from 23.48% at 0% inclusion to approximately 28.5–28.9% once any level of mycoprotein was added, regardless of the specific inclusion rate. This suggests that even a small amount of mycoprotein contributes significantly to moisture retention, likely due to its water-binding properties.

The increase in moisture content with mycoprotein inclusion likely enhances crumb softness and extends initial freshness by reducing staling rates through improved water retention in the bread matrix. This elevated moisture, however, could also raise susceptibility to microbial growth, impacting shelf stability. Further studies are needed to assess these effects in detail and these studies fall beyond the scope of this current analysis.

Moisture Content
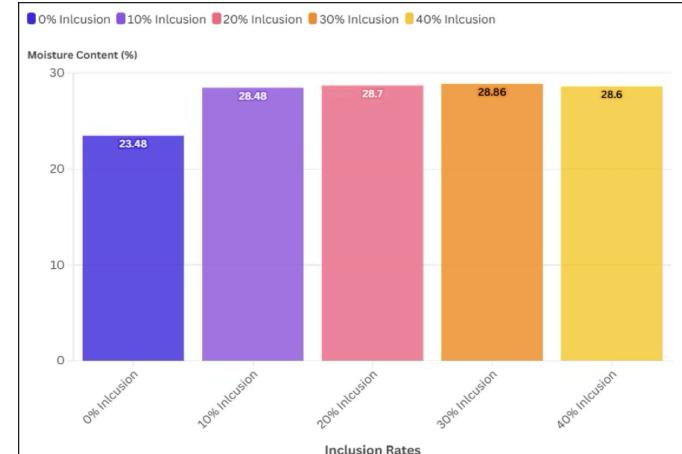
Figure 6: Moisture Content of Bread Formulations with Varying Mycoprotein Inclusion Levels

Discussion & Summary

The growing reliance on refined bread products across Asia, in conjunction with carbohydrate-dense staples such as rice, has exacerbated nutritional imbalances, particularly in protein intake, thereby contributing to the rise of diet-related metabolic disorders [1,2]. This research addresses these concerns by investigating the incorporation of *Neurospora crassa*-derived mycoprotein into bread formulations, with the aim of increasing protein and fiber content while reducing carbohydrate levels.

Mycoprotein, a sustainable protein source derived from filamentous fungi, offers a well-balanced protein composition with a moderate concentration of essential amino acids. Additionally, it is rich in dietary fiber, making it an excellent candidate for enhancing the nutritional profile of various food products. This positions it as an optimal solution for fortifying conventional bread, which is characteristically deficient in both protein quality and fiber [9].

Our experimental analysis demonstrated that the inclusion of mycoprotein in bread formulations led to a substantial increase in total protein content, rising from 8.13g/100g at 0% inclusion to 15.69g/100g at 40% inclusion. The composite amino acid profile revealed an improved essential amino acid composition, with notable contributions from key amino acids such as threonine, valine, isoleucine, and leucine. This enhancement in essential amino acids is especially valuable in bakery formulations, as it helps address common amino acid deficiencies in carbohydrate-heavy diets, where access to high-quality protein sources is often limited [10].

In addition to boosting protein content, mycoprotein inclusion increased dietary fiber levels, with fiber content rising from 1.7g/100g at 0% to 15.43g/100g at 40% inclusion. This increase compensates for the traditionally low fiber content in refined bread products, thus enhancing the overall nutritional value of the bread [12]. Increased dietary fiber in bread could promote gastrointestinal health, enhance satiety, and help regulate glycaemic response. While these health outcomes were not the primary focus of this study, it is hypothesized that

mycoprotein-enriched bread could offer long-term benefits beyond basic nutrition [14].

Moreover, mycoprotein inclusion was associated with a reduction in total carbohydrate content, decreasing from 56g/100g at 0% to 45.33g/100g at 40% inclusion, suggesting that mycoprotein could be a valuable ingredient for developing breads with a potentially lower glycaemic load [18]. Such formulations may be particularly advantageous for consumers managing metabolic health concerns, such as diabetes or insulin resistance, and are seeking lower-carbohydrate options within the bakery sector [19].

While a gradual increase in sugars was observed with higher mycoprotein levels, rising from 1.76g/100g at 0% to 6.48g/100g at 40% inclusion, this increase was modest relative to the overall reduction in total carbohydrates and this trend likely reflects the natural sugars present in mycoprotein.

Despite these promising nutritional improvements, the impact of mycoprotein on dough rheology remains insufficiently understood. Preliminary observations suggest that mycoprotein affects key dough properties—such as viscosity, elasticity, and water retention—but these insights are based on qualitative visual assessments and highlight the need for detailed quantitative analysis. Research on other alternative proteins in bread formulations has shown that both the type and concentration of protein can significantly alter dough behaviour, influencing crucial aspects like texture, structure, and the overall quality of the final bread product [9,10,11].

Optimizing these factors is essential to ensure that mycoprotein-enriched bread is not only nutritionally enhanced but also maintains the desirable sensory qualities that appeal to consumers [13]. Future studies should rigorously investigate these rheological properties, along with comprehensive sensory evaluations (taste, aroma, and mouthfeel), to maximize commercial viability and consumer acceptance [21]. The current research forms the foundation for developing formulations that effectively balance nutritional improvements with desirable sensory attributes [16].

In conclusion, mycoprotein derived from *N. crassa* has demonstrated considerable potential in enhancing the nutritional profile of bread by increasing both protein and fiber content, while concurrently reducing carbohydrate levels. This provides a viable solution to the nutritional challenges prevalent in carbohydrate-centric regions such as Asia [10]. Incorporating *Neurospora crassa*-derived mycoprotein into bread formulations offers a promising pathway to meet Asia's evolving dietary needs, where rising bread consumption reflects a shift towards more processed and convenience foods. This study demonstrates that mycoprotein can enhance the protein and fiber content of bread, addressing common nutritional gaps in carbohydrate-dominant diets such as those in Asia. Additionally, the sustainability of mycoprotein aligns with Asia's growing focus on reducing the environmental impact of food production [4]. By establishing foundational insights into both the nutritional benefits of mycoprotein-enriched bread, this research contributes to the development of innovative, sustainable food products that could cater to the region's health, dietary, and environmental priorities.

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Data-Driven Dynamics in Soccer: Exploring the Impact of Data Analytics on Strategy and Fan Engagement

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Motivated by a deep passion for soccer and a keen interest in computer science, I initiated this research to address two profound yet overlooked aspects of data analytics in soccer: first, the impact of data analytics on tactical strategy, and second, the need to explore how fan culture is intricately tied to data analytics in the sport. My paper thus investigates how data from technologies like GPS devices are not only utilized in soccer to enhance player performance and decision-making, but also to drive fan engagement. This research was conducted through a thorough review of academic journals, books, and case studies to analyze how clubs, notably FC Barcelona, implement GPS technology in soccer and its resultant effects on player performance. Additionally, the research involved examining scholarly articles and reports on fan engagement and data analytics in sports to understand the broader implications of these technologies in soccer. The paper also drew on insights from books and articles discussing the ethical aspects of sports analytics to provide a well-rounded view of the topic. Overall, this paper concludes that data analytics reshapes soccer strategy and fan engagement, but emphasizes the need to balance technology with the sport's traditional spirit and address ethical considerations in data utilization.

Introduction

This story of innovation begins with the integration of advanced Global Positioning System (GPS) devices into the training and match-day routines of soccer players. These devices, small yet powerful, are designed to capture every sprint, every movement, and even the slightest change in direction or speed. Imagine a scene at FC Barcelona's Camp Nou, the iconic stadium buzzing with excitement. On the field, a player like Sergio Busquets, known for his tactical intelligence, is in action. But now, there is an added layer to his game. The GPS device snugly fitted in his vest is silently collecting data – data that speaks volumes about his endurance and tactical movements. This moment perfectly illustrates how FC Barcelona harnesses the power of precise data to enhance their game. During the 2021-22 LaLiga season, it was this very technology that highlighted Busquets' remarkable stamina, showcasing an average distance of about 11.19 km covered per game, a testament to his relentless energy and strategic positioning. In another electrifying instance, during the 2022 Champions League, Ousmane Dembélé, known for his blistering pace, dashes across the field. The crowd roars as the GPS device clocks his peak speed at an astounding 36.60 km/h. This is not merely about speed; it is about quantifying the unquantifiable, turning a display of athletic prowess into a data point that can be analyzed and appreciated. It is about transforming raw data into actionable insights.

These examples showcase a broader trend: the profound impact of data analysis across varied fields. While the realm of soccer demonstrates vividly the positive aspects of this impact, an entirely different context where its effects are equally as striking, albeit in a more concerning light, is in the field of sociopolitical policy, explored by Susan Greenhalgh in *Just One Child: Science and Policy In Deng's China*. Greenhalgh reveals how China's once-celebrated large population, when compared with data from industrialized nations, transformed into a symbol of national struggle. She states, "Once a cause for pride, China's bulky population was now a source of national humiliation" (Greenhalgh 118). This shift, driven by data, underscores a cautionary tale: the potential for misrepresentation or overreliance on quantified data, leading decision-makers astray. Greenhalgh's analysis serves as a reminder of the double-edged nature of data in shaping policies and public perception. Similarly, in soccer, while the meticulous analysis of player data like stamina, speed, and

distance covered offers significant tactical advantages, it also carries a latent warning.

Overreliance on quantitative data could potentially overshadow other crucial aspects of the game, such as player intuition, teamwork, and mental resilience. This reliance on data, if not balanced with qualitative judgment, risks reducing the complex dynamics of soccer to mere numbers. Thus, the transformative power of data in sports, just as in policy, requires a careful balance to avoid leading decision-makers, coaches, and fans down a path where the essence of the sport is lost in the digits.

First delving into the integration and influence of GPS technology in soccer analytics, focusing on its origins, development, and operational use in the sport, the paper then utilizes a case study of FC Barcelona to highlight the application of GPS data in training and tactical decisions, and its impact on player performance. The scope then broadens to assess how various soccer teams utilize GPS technology, exploring its diverse applications and effects on fan engagement, both in-stadium and digitally. The paper also addresses the challenges and ethical concerns of soccer analytics, including data privacy and the balance between data-driven and intuitive approaches, emphasizing their impact on the sport's culture and fan experience. In essence, this paper aims to shift the focus in soccer analytics from solely examining the technology's role in isolation to exploring the cultural and historical context that has enabled its profound impact on the sport. I argue that the effectiveness of advanced technologies like GPS in transforming soccer's strategic and training methodologies would have been considerably less pronounced without the cultural and historical backdrop that nurtured their adoption.

Advent of GPS Technology in Soccer

Since its introduction in 2008, GPS technology in soccer has undergone a significant evolution and is now an indispensable tool for soccer analytics. Initially, it was integrated into Electronic Performance and Tracking Systems (EPTS) to monitor basic metrics like running speed, distance covered, and heart rate. This initial use marked the start of a technological revolution in measuring and analyzing player performance and fitness. With the technology's maturity, GPS devices began to offer more nuanced metrics such as acceleration, deceleration, and player workload, signaling a shift from mere physical monitoring to a more comprehensive performance analysis. This advancement facilitated a deeper understanding of the physical demands placed on players during games and training sessions. Furthermore, the application of GPS technology extended beyond physical metrics to include strategic analysis. Coaches and analysts started using GPS data to scrutinize players' positioning and space utilization on the field. This strategic application provided valuable insights for tactical planning, allowing teams to develop strategies based on precise movement patterns and the physical capabilities of players. Tracking a player's movement in relation to teammates and opponents opened new avenues for tactical innovation and in-game decision-making.

This progression from basic tracking to advanced performance analysis necessitated not only technological innovation but also developmental and operational excellence in the implementation of these systems. In developmental terms,

miniaturization and enhanced wearability were crucial. GPS devices evolved into compact, lightweight units that can be worn without hindrance, enabling more natural movement and accurate data collection. Paired with advancements in battery life and durability, the devices became capable of enduring the rigors of a full match or extended training sessions while providing uninterrupted data.

Operationally, the emphasis has shifted toward efficient data synchronization and analysis. Integrating data from multiple players into a cohesive analytical framework became vital for team-level insights, demanding sophisticated software solutions that could process complex GPS data and present it in an actionable format for coaches and players. Features like customizable dashboards and detailed reporting tools enabled teams to tailor strategies based on comprehensive data analysis. GPS technology's operational use also encompasses training load management and injury prevention. By monitoring various physical parameters, coaches can fine-tune training regimens to optimize performance while minimizing injury risks. The development of GPS technology has continued in response to these operational needs, emphasizing scalability and integration. Modern GPS systems are designed to be adaptable to the infrastructures of diverse teams, ensuring that teams of varying sizes and resources can access the benefits of advanced sports analytics.

FC Barcelona's Use of GPS Technology in Soccer

FC Barcelona's implementation of the WIMU PRO GPS system across its youth and senior teams exemplifies their leadership in sports science. This sophisticated system tracks and analyzes key variables such as high metabolic load distance, high-speed running, player load, and total distance. The WIMU system, integrated into comfortable GPS vests, is a comprehensive solution for athlete performance monitoring, capable of generating up to 20,000 data points per second across over 250 variables. The data is processed using the ETPS performance electronic tracking device and advanced calculus programs. The WIMU PRO system offers features like real-time data visualization, in-depth post-session analysis, and cloud-based dashboards, enhancing the club's ability to optimize training, manage player fitness, and prevent injuries. The system's flexibility for use in various conditions, combined with its comprehensive data collection, makes it a vital tool for FC Barcelona in maintaining athlete health and improving performance on the field.

In the 2017/2018 season, a detailed study at FC Barcelona, utilizing the WIMU PRO GPS system, analyzed the activities of their first male team, U18, and U19 teams over a considerable period. This comprehensive research covered 46 weeks for the first team, 45 weeks for the U18 team, and 44 weeks for the U19 team, involving numerous training sessions and official matches. The GPS data revealed that load distributions, indicative of the physical stress experienced by players, were significantly higher on game days and during training sessions three days prior to matches, underlining the deliberate planning of training intensity to ensure players are optimally prepared for upcoming games. Additionally, the study found that muscle injuries, both time-loss

(injuries severe enough to necessitate a break from training) and non-time-loss (less severe injuries that do not prevent continued participation in sports activities), were closely related to these load distributions. The data showed 34 muscle injuries across the teams, with the highest injury rates recorded on game days, followed by those critical training sessions before matches. This correlation suggests a direct link between the intensity of external workload and the likelihood of muscle injuries. Notably, the GPS metrics indicated that the incidence of injuries was higher in training sessions three days prior to the match than on the match day itself, contrary to what might be expected from merely analyzing exposure hours (number of hours players spend engaged in activities where they are at risk of injury). This nuanced understanding emphasizes the importance of carefully managing training loads to optimize player health and performance, and the use of the WIMO PRO system by FC Barcelona allowed for such a precise and data-driven approach to monitoring and adjusting training regimens.

While the case study highlights the potential of GPS systems in transforming sports training and player management, it also brings to light the limitations of such technologies. One key issue is the resource-intensive nature of such systems. The need for sophisticated software and skilled analysts to process and interpret the massive amount of data generated can create a significant barrier for smaller organizations or teams with limited budgets. This disparity in resources can potentially lead to a widening gap in performance analytics capabilities between wealthier, more technologically advanced clubs and their less affluent counterparts, affecting the competitive balance within the sport. Another notable concern is the potential over-reliance or dependency on these technologies by players and coaching staff, which poses practical risks. For instance, if a team becomes too dependent on data for decision-making, they may find themselves at a disadvantage during situations where the technology is unavailable due to technical issues or other reasons. This dependency also raises questions about player autonomy and the potential for data to dictate every aspect of training and play. While data-driven approaches can optimize performance, they might also lead to scenarios where players are treated more as assets to be managed through numbers rather than as individuals with unique skills and instincts.

Applications of GPS Technology in Soccer Among Other Teams

Various other soccer teams employ GPS technology with distinct applications and objectives, shaped by the capabilities of different brands. For instance, Premier League teams like Arsenal, Manchester City, and Sunderland use STATSports' Viper pods to monitor players' physiological performance and tailor training workloads. This technology, similar to FC Barcelona's WIMO PRO system, aids in injury prevention by tracking metrics such as high-speed running and acceleration. On the other hand, European giants like Bayern Munich FC and Paris Saint Germain FC utilize Catapult's GPS Vest Tracker, known for its comfort and detailed performance analysis, including heat maps for visual tracking. AC Milan and AS Monaco have adopted GPEXE by Exelio for its high-frequency devices, offering precision in tracking speed and directional changes. Meanwhile, Playermaker, used by teams like Liverpool FC, offers a unique approach with wearable devices for cleats, focusing on physical and technical data like kick velocity. These varied applications underscore how different GPS technologies cater to the specific needs of soccer teams, enhancing training, performance analysis, and injury prevention strategies.

Influence of Data Analytics on Fan Culture in Soccer

The UEFA Champions League Data API (Application Programming Interface) is a pivotal tool that has revolutionized how fans engage with soccer. It serves as a crucial gateway, providing real-time data, including GPS data, that greatly enhances the viewing experience. In fact, recent studies conducted by Data Sports Group have demonstrated a significant increase in fan engagement and satisfaction due to these real-time data features. Through this API, fans gain instant access to live scores, detailed player statistics, and team line-ups as the game unfolds. This means fans are no longer just passive spectators; they are empowered to analyze the game with the same depth of data available to commentators and analysts. The crucial link to fan-facing platforms comes into play here: this rich, real-time data from the API is seamlessly integrated into various fan-centric digital services and applications. These platforms utilize the API's data to offer personalized fan experiences, including tailored match notifications, player-specific highlights, and curated video content. This integration ensures that fans are constantly engaged with relevant and up-to-date information about their favorite teams and players, connecting them intimately to every pivotal moment of the games they are most passionate about. Moreover, the technology facilitates greater fan involvement with their favorite teams, both during and after events. For instance, through digital platforms, fans can participate in activities like voting on logo designs, staying updated with team news, and providing feedback on significant team decisions, such as selecting new managers, through polls and other interactive tools. Innovative engagement strategies extend to interactive fan experiences in the stadium, where fans can enjoy in-game features like selecting a song or receiving rewards for frequent concession visits. Data analytics enables more precise targeting of fans, offering them personalized promotions and discounts based on their past attendance and preferences. Such access enables a more interactive and informed viewing experience, fostering deeper connections between fans and their favorite teams or players, and enriching the overall fan culture in soccer. Besides real-time data, the Champions League Data API also offers extensive historical data, enabling fans to explore the tournament's rich history. This includes past results, team performances, and individual player records. Such data allows fans to relive memorable moments and gain a broader perspective on the evolution of the Champions League tournament.

Beyond that, the integration of VR (Virtual Reality) with the UEFA Champions League Data API has revolutionized the way fans consume soccer. In the 2017 UEFA Champions League semi-finals and final, UEFA introduced a groundbreaking virtual reality (VR) experience, revolutionizing the way fans interacted with football. Central to this innovation was the virtual VIP lounge, accessible via Samsung Gear VR, Oculus glasses, and mobile phones, creating an immersive, interactive environment

that went beyond traditional viewing. The experience featured a live stream view, offering fans a unique perspective of the game directly from the pitch. This view was enhanced with 180-degree live streaming and the ability to teleport around the pitch for various 360-degree viewpoints, allowing fans to virtually jump to different locations and gain a comprehensive view of the game. Another significant aspect was the dashboard view, which provided a wealth of live statistics, video replays, lineups, and exclusive 360-degree videos. This feature enabled fans to delve deeper into the game, offering insights into player performances, game statistics, and replays from different angles. The inclusion of exclusive 360-degree videos, such as behind-the-scenes footage and player interviews, further enriched the fan experience, offering insights and content usually inaccessible to viewers.

In the realm of fantasy football and betting, the availability of data through APIs has significantly transformed how fans interact with the sport. These APIs provide access to real-time odds, player pricing, and comprehensive player and team statistics, empowering fans to make informed, data-driven decisions when managing their fantasy teams or engaging in sports betting. This high level of integration means that every player change, injury update, or real-world performance can directly impact both the outcomes in fantasy leagues and the betting markets, making the experience much more dynamic and interactive. Moreover, this integration has elevated the strategic aspect of both fantasy football and betting. Fans now have the ability to analyze vast amounts of data, from player performance metrics to historical trends, allowing for more nuanced and informed decision-making. This has led to a more competitive environment in both realms, where success is not just about luck or superficial knowledge of the sport, but also about the ability to interpret and utilize data effectively. The availability of detailed data has also fostered a deeper connection between fans, the sport, and the betting aspects. By engaging with the data, fans become active participants, gaining a deeper understanding of the sport's nuances, player capabilities, and team strategies. This enhances their overall experience as spectators and bettors, leading to a more immersive experience where fans are more invested in both the real-world games, their fantasy league performances, and their betting strategies. Furthermore, this technology-driven approach has opened up new avenues for community engagement and social interaction. Online platforms and forums where fans discuss strategies, share insights, and celebrate victories have become integral to both the fantasy football and betting cultures. These communities foster a sense of belonging and camaraderie among fans, transcending geographical barriers and bringing together people with a shared passion for the sport and betting.

Implications of Data Analytics in Soccer

The evolution of data analytics in soccer not only transforms the way the game is played but also challenges its traditional ethos, which has long emphasized the natural, intuitive aspects of the sport. Historically, soccer has been celebrated for its spontaneity, the natural flair of its players, and a certain unpredictability that comes with human decision-making. However, the rise of data-driven methods potentially disrupts this, as decisions increasingly rely on statistical analysis and predictive modeling. This shift could diminish the emphasis on instinctive play and the

artistic charm that has been a hallmark of soccer. In the pursuit of analytical excellence, there is a risk that soccer might lose some of its traditional essence, which was less about numbers and more about human spontaneity and creativity. Jennifer Robertson in *Robo Sapiens Japanicus* observes a similar phenomenon in another domain: "In short, roboticists tend uncritically to reproduce and reinforce dominant stereotypes (or archetypes) attached to human female and male bodies" (Robertson 100). This reflection is pertinent in soccer analytics, as the reliance on data might lead to a homogenization of playing styles, echoing the way technology can sometimes perpetuate existing norms or biases in other fields. In soccer, one such bias could be in player recruitment and selection, where data analytics might disproportionately favor players with certain physical attributes, such as height or speed, over those with exceptional strategic thinking or technical skills. This trend could inadvertently uphold a bias towards selecting physically dominant players, potentially overlooking talented individuals who do not fit this specific mold. Additionally, data analysis might also reinforce tactical norms, encouraging teams to adopt similar styles of play based on what is statistically successful, thus stifling tactical diversity and innovation. As teams increasingly adopt strategies based on similar analytical insights, the creative unpredictability that has long been a hallmark of the game might also dampen. Moreover, the increasing prominence of data analytics in soccer raises questions about the sport's cultural legacy and its connection with fans. Traditionalists argue that the essence of soccer lies in its unpredictability and the emotional connection it fosters among fans, aspects that might be diluted if the game becomes overly analytical. The charm of witnessing a moment of individual brilliance or a tactical masterstroke born out of instinct rather than data-driven planning is a crucial part of soccer's allure. There is a growing concern that an over-reliance on analytics could lead to a disconnect with fans who cherish these spontaneous aspects of the game, similar to how technology, as highlighted by Robertson, might influence societal perceptions in ways that are not always anticipated or desired.

Moreover, the integration of advanced data analytics in soccer brings to the forefront a range of ethical considerations, particularly concerning data surveillance and privacy. The extensive collection and meticulous analysis of player data, while beneficial for performance enhancement and strategic planning, engender scenarios of asymmetric information. In such situations, management and coaching staff may have access to significantly more information about players' physical and mental states than is shared with the players themselves. This imbalance can lead to potential conflicts and ethical dilemmas in areas such as contract negotiations, where management might use detailed data insights to leverage terms, or in player evaluations, where decisions could be made based on data that players are not privy to or fully understand. This disparity in information also raises concerns about the overall transparency and fairness within the sport. Players, as the primary subjects of this data collection, might feel commodified or under constant scrutiny, affecting their mental well-being and their relationships with management and coaching staff. The lack of transparent policies regarding data collection and usage can create an environment of mistrust and unease. In addition to these concerns, the utilization of personal and biometric data in soccer introduces significant privacy issues.

Questions arise about the extent to which this data should be collected, analyzed, and utilized. There are ongoing debates about the ownership of such data - whether it belongs to the players, the teams, or the leagues - and about who should have access to it. The potential for misuse of sensitive personal data is a legitimate concern, especially in an era where data breaches and privacy violations are increasingly common.

Conclusion

This paper transcends the boundaries of soccer, offering insights with far-reaching implications in the broader context of sports analytics, cultural dynamics, and technological ethics. Dissecting the role of data analytics in soccer not only sheds light on the sport's tactical evolution but also serves as a microcosm for understanding the impact of technology in modern sports. The findings highlight a paradigm shift in athletic performance analysis and strategy formulation, reflecting a broader trend in the sports world where data-driven decision-making is becoming increasingly paramount. Furthermore, the interweaving of data analytics with soccer's cultural aspects exemplifies how modern technology can influence and redefine cultural practices and communal experiences. Here, Bruno Latour's insight in *We Have Never Been Modern* is particularly relevant. Latour observes, "So long as we consider these two practices of translation and purification separately, we are truly modern - that is, we willingly subscribe to the critical project even though that project is developed only through the proliferation of hybrids down below" (Latour 11). This quote underscores the intertwined processes of "purification" and "hybridization" in modernity. In the context of soccer, data analytics represents a form of purification, dissecting the sport into quantifiable metrics. However, its integration within the cultural fabric of soccer exemplifies hybridization. This interplay between the scientific rigor of data analysis and its assimilation into the cultural realm of soccer embodies Latour's concept of co-production, illustrating the complex, intertwined nature of technological advancements and cultural evolution. Through this lens, the evolution of soccer with data analytics is not just a scientific development but a cultural transformation, showcasing the inseparable nature of science and culture as outlined by Latour.

From an ethical standpoint, the exploration of privacy and surveillance in soccer analytics resonates far beyond the boundaries of the sport, touching on pivotal concerns in the era of big data. The paper uncovers challenges and dilemmas that, while rooted in soccer, are reflective of broader societal questions concerning data privacy, the ethical use of personal information, and the delicate equilibrium between technological progress and individual rights. The paper does more than just bridge the specific issues within soccer analytics to larger ethical considerations; it offers a significant contribution to the dialogue on responsibly navigating technological innovation. Moreover, the implications of this research extend well beyond the soccer field, emphasizing its crucial role in the broader discourse on technology's place in society. It compels us to critically examine the integration and regulation of technological advancements, extending our inquiry beyond the realm of sports to various facets of life. In doing so, the insights gleaned from soccer become invaluable for policymakers, technologists, and cultural analysts,

highlighting the crucial need for a harmonious balance where technology enhances, rather than dominates, the human and cultural elements of our society.

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Efficient Deep Learning for Melanoma Diagnosis on CPU Hardware

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Convolutional Neural Networks (CNNs) are a category of Neural Networks that have grown increasingly prominent in Computer Vision applications such as Image Classification, Image Segmentation, and Object Recognition. Practical uses of CNNs are seen in many academic fields, this study focuses on exploring their applications in Medical Imaging, particularly classifying skin lesions into benign or malignant cases using deep learning techniques to improve diagnostic accuracy. Along with the neural network architecture containing four convolutional layers, the model implements ReLU activation, max-pooling, and batch normalization to improve the accuracy and efficiency of the model. Due to the binary nature of the model's classification, an adaptive average pooling layer, dropout regularization, and a sigmoid activation function were also employed. The training and validation process was done on a dataset consisting of 10600 images of Melanoma, publicly available under the CC0 Domain License on Kaggle. The loss function was calculated using Binary Cross Entropy Loss. This model incorporated data augmentation techniques such as random rotations, flipping, and affine transformations for improved generalization. After 30 epochs, the network achieved 90.69% training accuracy and 91.20% test accuracy, with notable computational efficiency processing approximately 106.7 images per second on CPU hardware. The total runtime of both train and validation was approximately 45 minutes, highlighting its efficiency. The test accuracy was visualized via a confusion matrix, which validated the reliability of its predictions. These results underline the potential of this CNN as an automated clinical decision-support tool for dermatologists in aiding the early and accurate diagnosis of melanoma, proving how powerful deep learning can be in solving complex medical imaging challenges.

Introduction

Melanoma is an aggressive form of skin cancer characterized by the uncontrolled growth of melanocytes, often caused by excessive UV exposure[1]. Melanoma accounts for approximately 1% of skin cancer cases, yet it remains responsible for the majority of skin cancer-related deaths worldwide[1]. Detecting cases of Melanoma at its localized stage is crucial to improving survival rates, as these cases tend to have a much greater five-year relative survival rate than regional and distant cases[2]. Techniques such as dermoscopy and histopathological analysis rely heavily on the expertise of clinicians and can be subjective, leading to variability in outcomes[3]. Consequently, there is a growing need for automated tools that can assist in the diagnosis of early-stage melanoma with high accuracy and consistency.

CNNs have demonstrated capabilities in extracting and learning complex patterns in visual data[4]. These capabilities have led to the rise of CNNs in various healthcare applications, including disease detection, segmentation, and classification, making them a promising candidate for melanoma diagnosis[4]. Unlike traditional machine learning models that require handcrafted feature extraction, CNNs automatically learn hierarchical features directly from the image data, making them highly effective for image classification tasks[5].

This study presents a deep learning-based approach for classifying skin lesion images into benign and malignant categories. The dataset used for training and validation is a publicly available dataset with a CC0 Public Domain License on *Kaggle*[6]. It contains deidentified images, ensuring anonymity and ethical approval. The model was trained on 9600 images and then validated on 1000 images, utilizing advanced techniques such as data augmentation to mitigate overfitting and improve generalization[6]. On a CPU, this dataset's total training and validation time was approximately 45 minutes, speaking for its efficiency and accuracy. The network architecture incorporates multiple convolutional and pooling layers, batch normalization, and a dropout mechanism for regularization, optimized using the Adam optimizer and binary cross-entropy loss.

The primary objectives of this research are to (1) develop an efficient CNN model tailored for melanoma classification, (2) evaluate its performance on unseen test data, and (3) establish its potential utility as a clinical decision support tool. By achieving a

training accuracy of 90.69% and a test accuracy of 91.20% based on over 1000 images, this work highlights the effectiveness of deep learning in addressing critical challenges in dermatological diagnostics.

Methods

Dataset and Preprocessing

The model was trained and evaluated using a dataset of 9,600 labeled images of skin lesions, divided into benign and malignant categories. The dataset was split into training (80%) and test (20%) subsets. Extensive data augmentation techniques were applied during training to enhance model generalization[7]. These included:

- Resizing: Images were resized to 160×160 pixels.
- Random Horizontal Flipping: Applied with a probability of 0.5.
- Random Rotation: Rotations up to 20° were introduced.
- Random Affine Transformations: Translations up to 20% of the image dimensions were applied.
- Normalization: Pixel values were normalized to match the ImageNet mean ([0.485,0.456,0.406]) and standard deviation ([0.229,0.224,0.225]).

Model Architecture

The Convolutional Neural Network (CNN) consists of four convolutional layers designed to extract hierarchical image features, followed by binary classification. The architecture is as follows:

1. Feature Extraction Layers:
   - Each convolutional layer applies filters to the input, defined by:

   $$y_{ij} = ReLU\left(\sum_{m,n} W_{mn} \cdot x_{(i+m)(j+n)} + b\right)$$

   - Where y_{ij} is the output at position (i,j), x is the input, W is the filter, b is the bias, and ReLU(z) = max(0,z) is the activation function.
   - Max-pooling layers reduce spatial dimensions while retaining salient features, defined as:

   $$z_{ij} = \max_{m,n} x_{(i+m)(j+n)}$$

   - Batch normalization was applied after each convolutional layer to stabilize training and reduce sensitivity to initialization.
2. Classifier:
   - Adaptive average pooling was used to reduce the feature maps to a fixed size of 1 x 1.
   - A fully connected layer maps the features to a single output using a sigmoid activation:

   $$Sigmoid:\ y = \frac{1}{1+e^{-z}}$$

   - Where z is the linear output of the classifier.

Training and Optimization

The model was trained using binary cross-entropy loss, which is designed specifically for binary classification tasks[8]. The equation is given by:

$$L = -\frac{1}{N}\sum_{i=1}^{N}[y_i log(p_i)+(1-y_i)\,log(1-p_i)]$$

where N is the number of samples, y_i is the true label, and p_i is the predicted probability for sample i.

The Adam optimizer was employed with a learning rate of 0.001, leveraging its adaptive learning rates to improve convergence[9]. The training process was carried out over 30 epochs with a batch size of 64. Although the program provides support for GPU acceleration, training was conducted on a CPU, demonstrating the model's adaptability to varying computational resources.

Evaluation Metrics

Model performance was evaluated using accuracy, confusion matrices, and precision-recall metrics[8]. Accuracy was calculated as:

$$\frac{True\ Positives + True\ Negatives}{True\ Positives + True\ Negatives + False\ Positives + False\ Negative}$$

Precision: The proportion of correctly predicted positive instances out of all instances predicted as positive.

$$Precision = \frac{True\ Positives}{True\ Positives + False\ Positives}$$

Recall: The proportion of correctly predicted positive instances out of all actual positive instances.

$$Recall = \frac{True\ Positives}{True\ Positives + False\ Negatives}$$

F1 Score: The Harmonic Mean of Precision and Recall

$$F1\ Score = 2 \cdot \frac{Precision \cdot Recall}{Precision + Recall}$$

Images per Second (IPS): The rate at which the model processes images every second.

$$IPS = \frac{Number\ of\ Photos \cdot Epochs}{Total\ Runtime\ in\ Seconds}$$

Implementation

The model was implemented in PyTorch, with training histories, including loss and accuracy, recorded for both training and validation datasets. This enabled visualization of model performance over epochs and supported subsequent evaluation of unseen test data.

This methodology ensures a robust and reliable framework for melanoma classification, optimized for deployment in clinical decision-support systems.

Data Ethics and Availability

The Melanoma skin cancer dataset was obtained from Kaggle and is released under the CC0 Public Domain license. This license permits the use of the dataset without the need for attribution. It contains de-identified images, ensuring patient confidentiality and anonymity.

Results

The Convolutional Neural Network (CNN) achieved the final validation accuracy of 91.20% in classifying melanoma images into benign and malignant categories. The training process, conducted entirely on a CPU, demonstrated significant computational

efficiency, with the model completing 30 epochs in approximately 45 minutes.

Training Progress:

Figure 1: Displays model training progress throughout one epoch.

Model Accuracy and Loss Over Epochs:
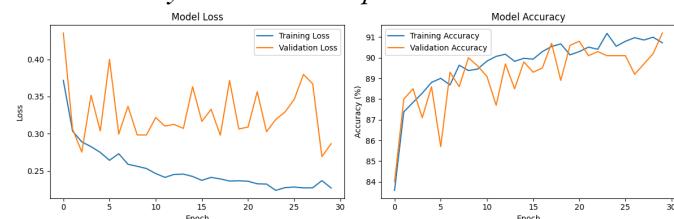
Figure 2: Depicts training and validation performances over 30 epochs

Confusion Matrix:
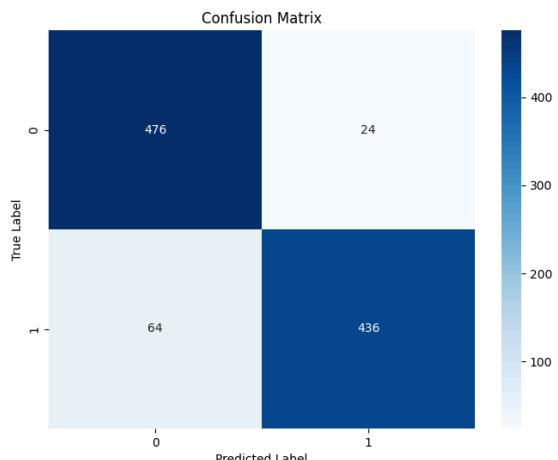
**Figure 3:** Confusion Matrix for Analysis of Model's Performance

Statistical Validation:

Figure 4: Classification report of the model

Analysis

The model accuracy in Figure 2 indicates a gradual improvement of accuracy until it stabilizes at approximately 90 percent. This trend is also seen in the validation accuracy, with a few fluctuations in the earlier epochs. Besides rare fluctuations in early epochs, Figure 2 indicates that the model learns effectively during training.

The Model Loss shows that the model optimizes the training set very well. This fluctuation is seen once again with the validation set. Though this could be seen as a sign of overfitting, the other diagrams and results indicate that there is minimal overfitting, and the model continues to generalize at a high rate, maintaining consistent performance on unseen data. Concerns of overfitting usually arise when the validation accuracy is significantly lower than the training accuracy, which is not the case here.

Furthermore, these fluctuations are generally associated with randomness in training. Techniques like data augmentation, and dropout implemented into the neural network architecture can contribute to fluctuations seen in Figure 2 without harming generalization(8). Additionally, the model achieves comparable performance on both validation and training data. This suggests that the model is learning general patterns seen in the imagery, rather than memorizing the training data(8). These fluctuations could also be attributed to the size and representativeness of the dataset. This CNN trained on a larger and more diverse dataset could provide a more stable graphical assessment of model generalization.

In Figure 4, the Precision, Recall, and F1 scores for Benign and Malignant classes are high and relatively balanced. Precision was defined as the ability to correctly identify a class without including false positives. Recall was the ability of the model to correctly identify all true positives. The F1 score of 0.908 demonstrates that the model maintains consistent and balanced performances across classes, ensuring robustness even in the presence of potential class imbalances.

The model's runtime of approximately 45 minutes on a CPU demonstrates its efficiency and practicality for high-performance applications where GPUs are unavailable. This model can thrive in resource-limited environments, where access to high-performance computing is constrained. Many state-of-the-art models that perform the same function require GPUs or other high-end hardware. Though these models are highly accurate, they often require a greater computational cost, processing similar datasets in a comparable timeframe in a shorter duration of time, but with significantly higher energy consumption. Additionally, the model's speed of 106.7 images per second on an AMD Ryzen 7 CPU highlights the optimization of the model for CPU environments. This model achieves a balance between computational efficiency and

accuracy. This efficiency can make the model suitable for possible scalable applications, such as applications in healthcare and telemedicine, allowing clinicians to upload and analyze images, and reducing the turnaround time for diagnoses.

To further verify the generalization of the model. The model architecture can be trained on another dataset to measure its performance on unseen data. By evaluating the model on an unseen dataset, we can assess whether the model is effectively learning generalizable features rather than just overfitting to the training data.

This research can be expanded upon in an amalgam of ways. Algorithmic enhancements could be implemented, optimizing the current CNN architecture further with techniques such as quantization or pruning. These techniques reduce computational requirements without greatly affecting the accuracy(10). The utilization of transfer learning from larger pre-trained models could enhance accuracy while maintaining the efficiency of CPUs. Furthermore, adapting this model for mobile devices could make the model even more impactful for real-time diagnostics in resource-limited settings.

Conclusion

The model's demonstrated ability to process 9600 images in approximately 45 minutes on a CPU showcases an efficient and more accessible alternative for state-of-the-art solutions that rely on high-end hardware. While maintaining a competitive accuracy, this model provides more insights into the growing demand for scalable and sustainable diagnostic tools for Medical imaging using deep learning techniques and CNNs. Future research can explore avenues in transfer learning, quantization, edge computing, and mobile device adaptability to further enhance its applicability across healthcare domains.

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Machine Learning for Real Time Classification of Transient Events: a Recurrent Neural Network Auto-Encoder and Gradient Boosting Classifier

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The rapid advancement of astronomical survey technologies, such as the Vera C. Rubin Observatory's Legacy Survey of Space and Time (LSST), is expected to generate millions of transient events annually, posing significant challenges in processing large volumes of unlabeled data. To address this, a deep learning model was developed, combining a Recurrent Neural Network Variational Autoencoder (RNN-VAE) for dimensionality reduction with a Gradient Boosting Classifier for real-time classification of transient events. This model efficiently classifies galactic and extragalactic transients without the need for labeled data. Using the PLAsTiCC dataset, the model achieved an AUC-ROC score of 0.94 and F-1 score of 0.89, demonstrating strong performance in distinguishing between various transient classes, including rare events. This approach offers a scalable solution for real-time astronomical surveys, enhancing both classification accuracy and resource allocation in future data-rich environments.

Introduction

The rapid advancement of astronomical survey technologies is set to provide astronomers with unprecedented volumes of data. The Vera C. Rubin Observatory's decade-long Legacy Survey of Space and Time (LSST), in particular, is expected to detect millions of transient events annually (Ivezić et al., 2019). This data influx offers the potential for the discovery of rare and previously unknown transient events.

However, managing this overwhelming volume of data presents significant challenges. Identifying which transients merit further investigation becomes increasingly difficult with the scale of incoming data. Spectroscopic follow-up, a critical method for understanding transient events, is both resource-intensive and requires a meticulous approval process, further complicating the selection of optimal targets for observation. Additionally, transient events must be captured near their peak brightness to justify the allocation of these limited resources.

To address these challenges, efficient methods for real-time labeling and prediction of transient events are urgently required. Early efforts in this field focused on photometric classification to build pure samples of transients (Boone, 2019). More recent approaches have shifted towards anomaly detection, with several methods demonstrating success when using complete light curve data from extensive surveys (Pasquet et al., 2018; Muthukrishna et al., 2019). However, these models struggle when faced with incomplete data, a common challenge in real-time analysis. To overcome this limitation, recent studies have explored the use of autoencoders to manage unlabeled data (Morawski et al., 2021).

This paper proposes a model aimed at real-time classification of galactic and extragalactic transient events, building on recent advancements in deep learning and autoencoder-based architectures. Section two describes the dataset and feature extraction process, while section three, four, and five outline the model and training process of the RNN-VAE and Gradient Boosting Classifier (GBC). The results are discussed in section six, where the model is heavily evaluated and compared to baseline models, and its limitations and future work are further stated. Finally, the paper is concluded in section 7.

Data

The model was trained and evaluated using the Photometric LSST Astronomical Time-series Classification Challenge (PLAsTiCC) dataset, which was initially created for a public competition hosted on Kaggle. Although the competition has since concluded, the dataset and the methods it inspired remain highly relevant due to the scale and innovation it introduced to the data science community (Hložek et al., 2020). The PLAsTiCC dataset contains simulated data based on approximately three years of observation from the Rubin Observatory (Kessler et al., 2019). It includes light curves and metadata such as redshift, flux, magnitude, corresponding errors, and additional physical parameters across six observational passbands (ugrizy). For this model, light curves and metadata were integrated

and processed through the RNN-VAE for feature extraction prior to classification.

For this study, 100,000 data points spanning sixteen transient event classes were used. These classes were selected to provide a balanced representation of both common and rare astronomical events. Frequently occurring events, such as supernovae, were well-represented, allowing the model to effectively learn their distinguishing characteristics. Conversely, rarer events like Tidal Disruption Events (TDEs) and Calcium-rich transients (CaRTs) were included to assess the model's capability in classifying minority classes, which typically present more challenges due to their limited instances.

To ensure balance, event classes with fewer than three instances were excluded from the analysis, as they would not provide sufficient data for reliable classification. This selection process enabled the model to be exposed to a diverse, yet representative, range of transient phenomena, ensuring it could generalize well across different event types. Balancing the dataset was crucial in mitigating bias toward overrepresented classes, while still allowing the model to effectively handle underrepresented, yet scientifically significant, events. Further details of the data selection process, including class distributions and the methods used to preserve their frequencies, are discussed in the pre-processing section.

AGN (Active Galactic Nuclei)

Active Galactic Nuclei (AGN) are highly energetic regions located at the centers of galaxies, characterized by the emission of intense radiation and variability in brightness over different timescales. Despite being relatively common, AGNs make up approximately 6.3% of the dataset, aligning with their prevalence in the universe.

CaRT (Calcium-Rich Transients)

Calcium-rich transients are a rare type of supernova known for their rapid evolution, relatively low peak luminosity, and strong calcium emission lines. These events account for roughly 0.3% of the dataset, accurately reflecting their rarity in astronomical observations.

EB (Eclipsing Binaries)

Eclipsing Binaries are systems of two stars whose orbits are oriented such that they periodically eclipse each other from the perspective of Earth. This leads to fluctuations in brightness. Given their common occurrence, EBs are well-represented in the dataset.

ILOT (Intermediate Luminosity Optical Transients)

Intermediate Luminosity Optical Transients (ILOTs) are astronomical events that explode with brightness levels between novae and supernovae. These rare occurrences account for less than 0.1% of the dataset.

M-Dwarf (Low-Mass Stars)

M-dwarfs, also known as low-mass stars, are stars smaller and significantly less luminous than the Sun. These stars represent a substantial portion of the dataset due to their frequency in the universe.

Mira (Mira-Type Variable Stars)

Mira-type variable stars are cool red giants known for their periodic changes in brightness. They are massive and very luminous compared to the Sun, although they make up less

than 0.1% of the dataset, reflecting their status as a minority event.

PISN (Pair Instability Supernovae)

Pair Instability Supernovae (PISN) are rare types of supernovae that result from collisions between gamma rays and atomic nuclei, producing free electrons and positrons. These events also make up less than 0.1% of the dataset.

RRL (RR Lyrae Variable Stars)

RR Lyrae variable stars are periodic variable stars commonly found in globular clusters. They make up a significant portion of the dataset due to their well-understood light curve characteristics.

SLSN-I (Type I Superluminous Supernovae)

Type I Superluminous Supernovae (SLSN-I) are hydrogen-free stellar explosions that are roughly ten times more luminous than typical supernovae. These events constitute approximately 2% of the dataset.

SN-Ia (Type Ia Supernovae)

Type Ia Supernovae (SN-Ia) are binary systems containing a white dwarf star. Known for their consistent peak luminosity and lack of hydrogen in their spectra, they represent over half of the dataset, making them the most frequent class of transient events.

SN-II (Type II Supernovae)

Type II Supernovae (SN-II) are massive stellar explosions characterized by the retention of hydrogen. These events, which exhibit long plateaus in their light curves, account for about one-fourth of the dataset, making them a major class.

SNIa-91bg (Type Ia-91bg Supernovae)

These are dimmer, faster, and redder variants of Type Ia Supernovae. Due to their shorter observable window, they make up about 1% of the dataset.

SNIax (Type Iax Supernovae)

Type Iax Supernovae are dimmer and faster than traditional SN-Ia events, although they are not necessarily redder. They constitute roughly 2% of the dataset.

SNIbc (Type Ibc Supernovae)

Type Ibc Supernovae result from the explosions of stars that have shed their helium and hydrogen envelopes. These events account for approximately 6% of the sample.

TDE (Tidal Disruption Events)

Tidal Disruption Events (TDEs) occur when a star is torn apart by the immense gravitational forces of a supermassive black hole. These rare events make up less than 1% of the dataset.

muLens-Single (Gravitational Microlensing Events)

Gravitational microlensing events result in a temporary increase in the brightness of background stars due to the gravitational influence of a massive foreground object. These events are uncommon, comprising less than 2% of the dataset.

Data Pre-Processing:

Before the light curves were input into the model, a thorough pre-processing routine was conducted to ensure the quality and reliability of the training data. Initially, any data points exceeding seven standard deviations from the mean were removed to

mitigate the impact of extreme outliers. Following this, sigma clipping was applied for five iterative cycles to account for potential shifts in the mean caused by residual outliers.

Several additional steps were implemented to address the astrophysical characteristics of the dataset. For nearby galactic events, particularly those with redshift values around 0.001, the distance modulus was adjusted to reflect a standard distance of approximately 10 megaparsecs (Heymann, 2012). This adjustment ensured consistency in distance measurements across different events, facilitating more accurate comparisons.

The magnitude scale was then recalibrated, with brightness increases represented by smaller apparent magnitudes, in line with standard astronomical observational practices. Additionally, to correct for dust extinction effects in the Milky Way, the Fitzpatrick (1999) extinction model was applied. This model, based on Milky Way parameters, assumes an extinction law of Rv = 3.1, with central wavelengths corresponding to the six LSST filters (ugrizy).

Event classes with fewer than three instances were excluded from the dataset to enhance the model's performance and ensure that statistically significant data were included in the final analysis. This pre-processing phase was essential for preparing the dataset, ensuring that it was both clean and representative of the various transient events being classified.
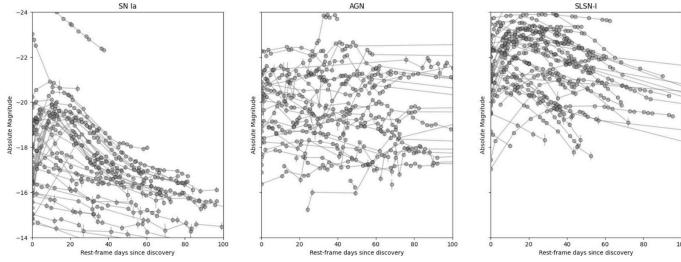

Figure 1: These plots graph the pre-processed lightcurves of SN Ia, AGN, and SLSN-I in terms of absolute magnitude. Note: created by student researcher

RNN-VAE Model Architecture

The model architecture employed in this study integrates a Recurrent Neural Network Variational Autoencoder (RNN-VAE) to reduce data dimensionality while retaining critical features of transient events. This architecture was chosen based on previous findings that demonstrated the effectiveness of feature extraction in supernova classification (V. Villar et al., 2019). The RNN-VAE model combines both RNN and VAE components, providing a dual advantage: capturing temporal dependencies in the data while generating a meaningful latent space representation.

The RNN-VAE comprises two main components: the encoder and the decoder (Figure 2). The encoder processes light curves, generating parameters that define the data's latent space representation.

Meanwhile, the decoder reconstructs the light curves from this compressed representation, reducing the feature set while maintaining vital information.
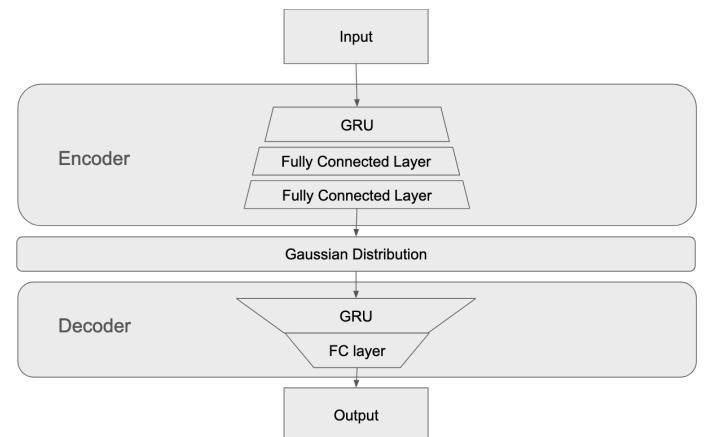

Figure 2: This diagram visually represents the structure of the RNN-VAE. Note: created by student researcher.

Encoder:
The encoder compresses the input light curves into a Gaussian distribution. It operates in three stages:

1. Gated Recurrent Unit (GRU): The input data passes through a GRU, a type of recurrent neural network that leverages sigmoid and hyperbolic tangent (tanh) activation functions to transform the input into latent outputs. These activation functions help regulate the information flow, deciding how much to retain from previous steps.
2. Fully Connected Layers: Two fully connected layers follow, applying linear and non-linear transformations to learn complex relationships between features.
3. Latent Space Representation: The final output of the encoder comprises the mean, standard deviation, and Gaussian distribution parameters that define the latent space.

Decoder:
The decoder reverses the encoding process, reconstructing light curves from the reduced latent space representation. It uses additional GRUs and fully connected layers to map the compressed data back to its original form. The decoder's output sequence retains only the most relevant features, optimized to include the six most significant features necessary for classification .

Feature Selection and Optimization:
The decision to limit the number of features to six was based on performance trials aimed at balancing model complexity and classification accuracy. These trials tested various feature counts, ranging from three to twelve, evaluating both the accuracy of the final classifier and the training/validation loss of the RNN-VAE itself. Results indicated that fewer than six features led to a drop in accuracy due to the loss of essential information, while more than six features resulted in diminishing returns and increased complexity, causing overfitting. Six features were thus selected as the optimal number for maintaining detail while ensuring model efficiency.

Table 1: Number of Features vs. Accuracy

Number of Features	Accuracy
1	0.001
2	0.03
3	0.15
4	0.56
5	0.79
6	0.89
7	0.88
8	0.89
9	0.82
10	0.83
15	0.78
20	0.82
25	0.65

Table 1: This table of values compares the number of features to the overall model's accuracy, demonstrating 6 features as the most accurate and efficient number. Note: created by student researcher.

How GRU Works in RNN-VAE:

The Gated Recurrent Unit (GRU) is a critical component of the RNN-VAE architecture, designed to efficiently process sequential data, such as the light curves of transient events. It is a type of recurrent neural network that optimizes the handling of temporal dependencies while minimizing computational complexity. Unlike traditional Recurrent Neural Networks (RNNs), GRUs utilize gating mechanisms to control the flow of information, making them particularly suited for time-series data with irregular time steps or missing values—common in astronomical datasets.

The GRU's structure (Figure 3) is simpler than that of the Long Short-Term Memory (LSTM) units but retains similar effectiveness in sequence learning. It comprises two primary gates—an update gate and a reset gate—that regulate the flow of information through the network:
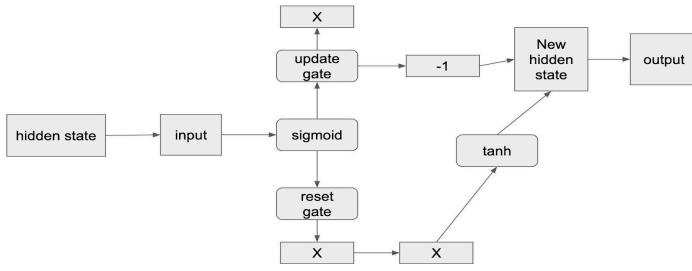
Figure 3: This diagram visually represents the structure of a GRU. Note: created by student researcher.

Update Gate:

- The update gate determines how much of the previous information needs to be carried forward to the next time step.
- It combines the roles of the LSTM's forget and input gates, effectively deciding which information to retain and which to discard.
- Mathematically, the update gate (ztz_tzt) is calculated as:
$$z_t = \sigma(W_z \bullet [h_{t-1}, x_t])$$
where W_z is the weight matrix, h_{t-1} is the hidden state from the previous time step, and x_t is the current input.

Reset Gate:

- The reset gate decides how much of the past information should be forgotten at the current time step.
- This allows the GRU to focus more on recent information when making predictions, which is crucial for reconstructing light curves in the decoder.
- The reset gate (r_t) is computed as:
$$r_t = \sigma(W_r \bullet [h_{t-1}, x_t])$$

Current Memory Content:

After determining the update and reset gates, the GRU computes the candidate hidden state $(\widehat{h}_t)$, which incorporates both the current input and the previous hidden state,

t modulated by the reset gate: $\widehat{h}_t = tanh(W \bullet [r_t * h_{t-1}, x_t])$

Here, the reset gate (r_t) controls how much of the past information influences the current candidate hidden state.

Hidden State Update:

The final hidden state h_t is a linear interpolation between the previous hidden state and the candidate hidden state, determined by the update gate:

$$h_t = (1 - z) * h_{t-1} * \widehat{h}_t$$

Role of GRU in RNN-VAE for Transient Classification:

The GRU's gating mechanisms allow the model to selectively retain or discard information at each time step, making it highly effective in modeling sequential dependencies in light curves. In the context of transient event classification, GRUs help capture key temporal patterns in the evolving brightness of different astronomical phenomena. This capability is essential for accurately reconstructing light curves and extracting meaningful features for subsequent classification.

The GRU's simplicity and efficiency, compared to more complex units like LSTMs, also make it faster to train while maintaining strong performance. This balance between computational efficiency and temporal accuracy is critical for handling the large, real-time datasets generated by astronomical surveys like the LSST.

Training and Optimization

The training of the Recurrent Neural Network Variational Autoencoder (RNN-VAE) was carried out in distinct phases: initialization, the training loop, optimization, and validation.

Initialization Phase:
Initially, the model's parameters were randomly assigned to ensure reproducibility across trials. Random initialization is crucial for establishing a baseline and enabling consistent performance comparisons (Kingma & Ba, 2015).

Training Loop:
The model was trained over multiple epochs, with each epoch comprising batches of data, allowing efficient processing of the dataset (Paszke et al., 2019). The training continued until either the entire dataset was processed or improvements in performance stagnated. Each epoch involved a forward pass through the encoder and decoder, followed by a backward pass to compute gradients and update model parameters.

During the forward pass:
- Encoder: The encoder compresses input light curves into latent space representations (Rezende et al., 2014).
- Decoder: The decoder reconstructs the light curves from this latent space.

After the forward pass, the backward pass computed gradients and loss values, which were used to refine model parameters and improve accuracy.

Optimization Strategy:
The optimization process employed the Adaptive Moment Estimation (Adam) optimizer, selected for its ability to adjust learning rates dynamically based on the first and second moments of the gradients (Kingma & Ba, 2015). Adam is particularly effective for managing sparse gradients in deep learning models, making it suitable for sequential data processing in this context.
The optimization process involved:
1. Gradient Calculation: Gradients of the loss were computed with respect to model parameters.
2. Parameter Updates: Parameters were iteratively updated to minimize the loss, facilitating convergence.

Composite Loss Function:
To maximize model performance, a composite loss function was utilized:
1. Mean Squared Error (MSE): Measures the reconstruction error between the original and reconstructed light curves, ensuring critical features are retained (Bengio et al., 2013).

$$MSE = \frac{1}{n}\sum (y - y_1)^2$$

2. Kullback-Leibler (KL) Divergence: Measures the divergence between the latent distribution and a Gaussian prior, guiding the latent space to conform to a normal distribution (Kingma & Welling, 2013).

$$KL(P||Q) = \sum P(X) \times log\frac{P(X)}{Q(X)}$$

The combination of MSE and KL Divergence aimed to maximize the Evidence Lower Bound (ELBO), a standard objective in VAEs that improves both reconstruction quality and the latent space distribution (Rezende et al., 2014).

Hyperparameter Tuning for GRU:
Several hyperparameters were adjusted throughout training to optimize model performance:
- **Number of Layers:** The GRU layers were set to 2, balancing complexity and computational efficiency (Cho et al., 2014).
- **Hidden Units:** 64 hidden units per GRU layer were chosen based on validation accuracy, ensuring sufficient capacity to capture light curve features.
- **Learning Rate:** A starting learning rate of 0.001 was used, with gradual decay to prevent overshooting minima during optimization.
- **Batch Size:** A batch size of 128 was found to be optimal, offering a good balance between convergence speed and stability (Paszke et al., 2019).

Validation and Early Stopping:
Validation was performed after each epoch, with validation loss serving as the primary performance metric. Early stopping was implemented to prevent overfitting, terminating training when the validation loss began to increase while the training loss remained stable (Prechelt, 1998). This comprehensive training process enabled the model to effectively extract meaningful features from light curves while maintaining robustness in classification tasks (Villar et al., 2019).

Gradient Boosting Classifier
A Gradient Boosting Classifier is an ensemble machine learning model that iteratively trains multiple sequential models to mitigate the errors of each preceding layer. The classifier utilizes a loss function known as deviance loss, which is derived from the negative log-likelihood of the multinomial distribution. Deviance loss imposes significant penalties for misclassifications, making it particularly effective for handling heavily imbalanced datasets, as illustrated in the following equation:

$$Deviance\ Loss\ =\ 2\sum[y_1(log)\frac{y_1}{\hat{\mu}} - (y_1 - \hat{\mu})]$$

In addition to employing deviance loss, the Gradient Boosting Classifier incorporates gradient calculations to minimize the loss concerning the outputs of the preceding learner, such as the RNN-VAE utilized in this study. This methodology is akin to the approaches taken by previous researchers who employed an Extreme Boosting Classifier to classify supernovae based on extracted features (Möller et al. 2016).

The base classifier within this framework is a decision tree, often referred to as a "weak learner." However, when combined in a Gradient Boosting Classifier, these decision trees form a much stronger predictive model. Gradient Boosting Classifiers are known for their high predictive capabilities and superior performance in handling heterogeneous data. Given the complex nature of the dataset in this study, the Gradient Boosting Classifier demonstrated improved performance compared to alternative models, such as Random Forest and Support Vector Machines.

The model underwent an iterative fine-tuning process over 105 cycles, during which key hyperparameters were carefully adjusted to optimize performance. These parameters included the number of estimators, maximum tree depth, minimum sample split, and purity decrease threshold. By methodically varying these

settings, the process effectively mimicked a systematic grid search, a common technique used in machine learning to identify the best parameter combinations for enhancing model accuracy.

- **Number of Estimators:** This parameter determines how many individual decision trees are used in the Gradient Boosting Classifier. Increasing the number of estimators typically improves performance but also raises the risk of overfitting. In my fine-tuning, I explored a range of values to find an optimal balance that maximized classification accuracy without compromising the model's generalizability.
- **Maximum Tree Depth:** The maximum depth of each decision tree controls the complexity of the model. A deeper tree can capture more intricate patterns in the data, but it may also lead to overfitting. Through the tuning process, I tested various depths to ensure that the model could adequately learn the underlying structures of the light curves while maintaining robustness against noise.
- **Minimum Sample Split:** This parameter specifies the minimum number of samples required to split an internal node in the decision tree. By adjusting this value, I could control how sensitive the model was to fluctuations in the data. Lower values allowed for more splits and potentially more detailed decision boundaries, while higher values enforced more generalization.
- **Purity Decrease Threshold:** This threshold determines the minimum reduction in impurity required to create a split in the decision tree. Fine-tuning this parameter enabled me to balance between creating too many splits (which could lead to overfitting) and too few (which could result in underfitting).

Throughout the 105 cycles, each adjustment was monitored for its impact on classification performance across a variety of transient event classes. The iterative process allowed me to systematically evaluate how changes in hyperparameters influenced the model's ability to accurately classify different types of transient events, from supernovae to rare events like Tidal Disruption Events (TDEs).

By carefully adjusting these parameters and observing the corresponding performance metrics, I achieved significant improvements in classification accuracy. The refined model demonstrated enhanced predictive capabilities, effectively capturing the complexities of the light curves associated with each transient event class. This optimization process not only improved the model's performance but also provided valuable insights into the relationships between hyper parameters and model outcomes, informing future research and development efforts.

Results and Discussion

The RNN-VAE model, paired with the Gradient Boosting Classifier (GBC), was trained and tested on the Photometric LSST Astronomical Time-series Classification Challenge (PLAsTiCC) dataset (Kessler et al., 2019). The model achieved an overall accuracy of 89%, an AUC-ROC score of 0.94, and an average precision, recall, and F-1 score of 0.89, demonstrating strong discriminative performance across a wide range of transient classes.

Class-Specific Performance:
To provide a detailed evaluation of the model's effectiveness, precision, recall, and F1-score were recalculated for each transient class (Figure 4). Given the imbalanced dataset, these metrics offer more meaningful insights than accuracy alone. The following analysis covers the updated performance metrics for each class:

Active Galactic Nuclei (AGN):
The model achieved a precision of 0.88, recall of 0.89, and an F1-score of 0.88 for AGN. Misclassifications were minimal, indicating that the model effectively distinguished AGNs from other classes. The use of advanced feature extraction could further enhance performance.

Calcium-Rich Transients (CaRTs):
The model performed well for CaRTs, achieving a precision of 0.93, recall of 0.94, and an F1-score of 0.93. This strong performance suggests that the model successfully captured the distinct characteristics of CaRTs, despite their limited representation in the dataset.

Eclipsing Binaries (EBs):
The model accurately classified EBs, achieving a precision of 0.96, recall of 0.94, and an F1-score of 0.95. The model's effectiveness in capturing the periodic patterns typical of EBs indicates its robustness in handling cyclic events.

Intermediate-Luminosity Optical Transients (ILOTs):
The model demonstrated high performance for ILOTs, achieving a precision of 0.96, recall of 0.95, and an F1-score of 0.95. Misclassifications were minimal, suggesting that the model captured the distinct characteristics of ILOTs effectively.

M-Dwarf Flares:
The model exhibited strong performance in classifying M-Dwarf Flares, with precision, recall, and F1-score all at 0.96. The model's high performance is attributed to the short-lived flaring behavior of M-Dwarfs, which is easily identifiable in photometric data.

Mira Variables:
The model showed strong performance for Mira Variables, achieving precision, recall, and F1-score of 0.95 each. This performance highlights the model's ability to effectively capture the distinct characteristics of Mira Variables.

Pair-Instability Supernovae (PISN):
The model exhibited high performance for PISN, achieving precision of 0.98, recall of 0.99, and an F1-score of 0.98. The high scores indicate that the model successfully differentiated PISN from other supernova classes.

RRLyrae Variables (RRL):
The model achieved strong performance for RRLyrae Variables, with precision, recall, and F1-score all at 0.95. The model's effectiveness in identifying the periodic variations typical of RRLyrae demonstrates its robustness in handling periodic events.

Type I Superluminous Supernovae (SLSN-I):
The model demonstrated strong performance in classifying SLSN-I, achieving precision of 0.92, recall of 0.94, and an

F1-score of 0.93. The model effectively identified the high-luminosity patterns characteristic of SLSN-I, with occasional misclassifications due to similarities with other supernova classes.

Type Ia Supernovae (SN Ia):
The model achieved a precision of 0.68, recall of 0.61, and an F1-score of 0.64 for SN Ia. Misclassifications were frequent with SN Iax and SN II, primarily due to overlapping early-phase light curve characteristics. Incorporating additional data or feature extraction techniques could improve performance.

Type II Supernovae (SN II):
The model showed moderate performance for SN II, achieving a precision of 0.64, recall of 0.61, and an F1-score of 0.62. Misclassifications primarily occurred with SN Ia, indicating similar early brightness characteristics. Further refinement in feature extraction could improve classification accuracy.

Type Ia-91bg Supernovae (SN Ia-91bg):
The model performed well for SN Ia-91bg, achieving a precision of 0.90, recall of 0.94, and an F1-score of 0.92. The high scores suggest that the model successfully distinguished this subtype from other supernovae.

Type Iax Supernovae (SN Iax):
The model performed well for SN Iax, achieving a precision of 0.85, recall of 0.86, and an F1-score of 0.85. Misclassifications with SN Ia were common, suggesting that further refinement of features could improve differentiation.

SNIbc (Type Ib/c Supernovae):
The model performed well for SNIbc, achieving a precision of 0.81, recall of 0.82, and an F1-score of 0.81. The balanced performance suggests that the model successfully captured the characteristics of SNIbc, although further improvements in recall could enhance accuracy.

Tidal Disruption Events (TDEs):
The model performed well in classifying TDEs, achieving a precision of 0.90, recall of 0.93, and an F1-score of 0.91. The model effectively captured the unique features of TDEs, such as their sharp rise and gradual decay.

muLens-Single:
The model achieved high performance for muLens-Single, with precision of 0.96, recall of 0.99, and an F1-score of 0.97. The model effectively captured the features of gravitational microlensing events, demonstrating its capability to handle rare transient classes.

Overall, the RNN-VAE model, paired with the GBC, demonstrated strong performance across a broad range of transient classes, as indicated by the precision, recall, and F1-scores. While the model excelled in handling imbalanced classes like TDEs and CaRTs, further refinement is needed to improve the classification of overlapping classes, particularly SN Ia, SN Iax, and SN II.
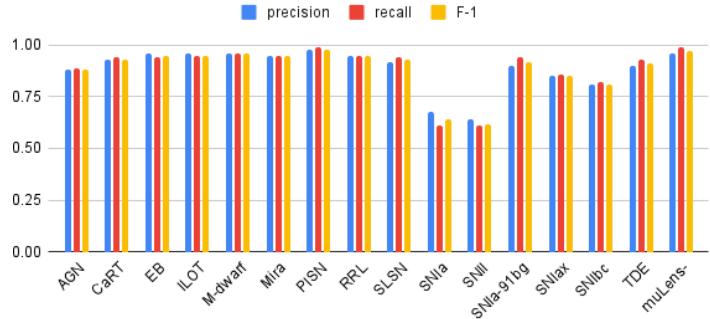

Figure 4: This histogram provides a visual comparison of the classes against each other.

Confusion Matrix Analysis:
The confusion matrix (Figure 5) provided insights into the model's strengths and weaknesses across all 16 classes (Pasquet et al., 2018). While the diagonal elements showed high accuracy for most classes, the highest misclassification rates occurred between SN Ia and SN II, as well as between SN Iax and SN Ia. This suggests that while the model performs well with distinct classes, it struggles with classes that have overlapping photometric features. Enhancing the feature extraction process or incorporating additional data could reduce these errors.
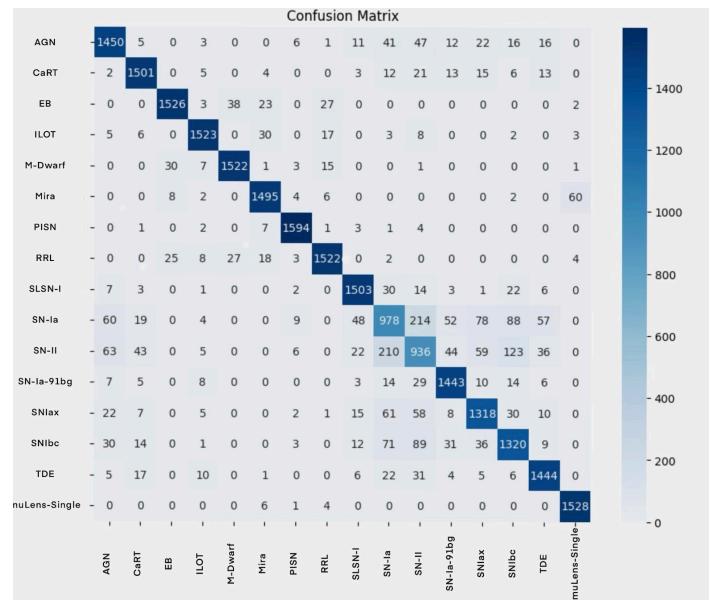

Figure 5: This confusion matrix compares the true and predicted labels of the data set against each other. Ideally, a confusion matrix appears as a dark, diagonal line. Note: created by student researcher.

Handling Class Imbalance:
Class imbalance was a significant challenge during model training, as common classes were more prevalent than rare ones (Boone, 2019). To address this, oversampling and class-weight adjustments were

used. These strategies improved recall for underrepresented classes but introduced a slight increase in false positives, particularly for classes with similar features (Kessler et al., 2019). Future iterations could further refine these methods to improve the balance between precision and recall.

ROC and AUC-ROC Curve:
An average AUC-ROC curve (Figure 6) was generated for all 16 transient classes, providing a comprehensive evaluation of the model's overall performance (Hložek et al., 2020). With an average AUC-ROC score of 0.94, the model demonstrated robust discriminative ability across classes. Averaging the AUC-ROC scores simplified performance comparisons and facilitated a clear assessment of the model's effectiveness in distinguishing transient types, even those with similar light curve features (Villar et al., 2019).

Comparison with Baseline Models:
The RNN-VAE + GBC model was compared against baseline models (Figure 7) used in the original PLAsTiCC competition, such as Random Forests, Support Vector Machines (SVMs), and Convolutional Neural Networks (CNNs) (Pasquet et al., 2018). The RNN-VAE + GBC showed significant improvements:

- **AUC-ROC:** The model achieved an average AUC-ROC score of 0.94, outperforming baseline models, which averaged between 0.87-0.89.
- **Precision and Recall:** For well-represented classes, the RNN-VAE + GBC surpassed baseline models by 5-10% in precision and recall. For rare classes like TDEs and CaRTs, the model improved precision and recall by 10-15% over the baselines.
- **Reduced Misclassifications:** The hybrid architecture allowed for better handling of complex decision boundaries, reducing misclassifications, particularly among supernova subclasses

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- **Reduced Misclassifications:** The hybrid architecture allowed for better handling of complex decision boundaries, reducing misclassifications, particularly among supernova subclasses.

Figure 6: The Receiver Operating Characteristic (ROC) Curve shows the relationship between the false and true positive rate, demonstrating the discrimination ability of the model. This ROC curve demonstrates the micro-averages of each class. Note: created by student researcher.

Limitations:
Despite the promising results of the RNN-VAE + Gradient Boosting Classifier model, several limitations need to be addressed:

- **Overlapping Light Curve Characteristics:** One of the main challenges observed was the misclassification between transient classes with similar light curve features, such as Type Ia (SN Ia) and Type Iax supernovae. The model sometimes struggled to differentiate these classes due to their overlapping photometric features, particularly in the early stages of their light curves. This limitation indicates that additional distinguishing features, such as spectral data, could improve classification accuracy.
- **Handling Noisy Data:** While the RNN-VAE architecture includes mechanisms to handle incomplete data, it remains sensitive to noise and distortions in light curves. In cases where data quality was compromised (e.g., due to low signal-to-noise ratios or gaps in observations), the reconstruction of light curves retained some distortions, which affected classification accuracy. Future improvements could involve advanced denoising methods or integrating attention mechanisms to better focus on cleaner data segments.
- **Computational Complexity:** The combined RNN-VAE and Gradient Boosting Classifier architecture is computationally intensive, requiring significant processing power for training and inference. This presents challenges for scaling the model to larger datasets or deploying it in real-time settings. Optimizations like model pruning, quantization, or distributed computing could help address

this limitation, making the model more efficient without sacrificing accuracy.

- **Class Imbalance Effects:** Although the model effectively handled class imbalance through oversampling and class-weight adjustments, these techniques introduced a slight increase in false positives for certain classes with overlapping characteristics. This trade-off highlights the need for more sophisticated strategies, such as synthetic data generation through Generative Adversarial Networks (GANs), to balance recall and precision without increasing misclassifications.

- **Generalization to New Data:** While the model demonstrated strong performance on the PLAsTiCC dataset, its generalization to new, unseen datasets remains uncertain. Variations in telescope sensitivity, observational conditions, or transient event characteristics could impact model performance. Additional training with more diverse datasets could improve robustness and generalizability.
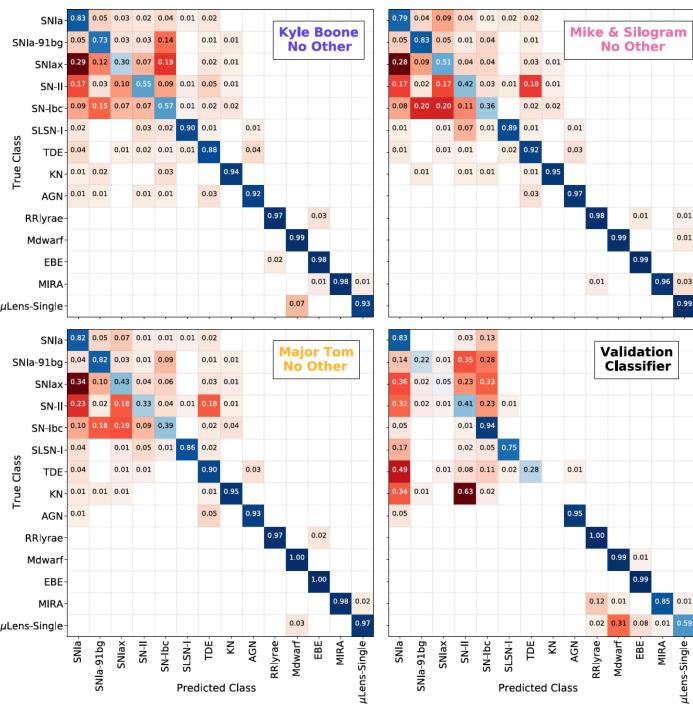
Figure 7: The confusion matrices showcase the pseudo-confusion matrices of the top three submissions of the Kaggle contest. Note: This figure is adapted from Hložek et al. 2020.

Future Work:

To address these limitations and further enhance the model's performance, several future directions are proposed:

- **Incorporating Spectral Data:** Integrating spectral data alongside photometric data could improve feature extraction, particularly for distinguishing between similar transient classes (Boone, 2019).
- **Attention Mechanisms:** Adding attention mechanisms to the RNN-VAE architecture could enhance feature learning by focusing on the most relevant temporal patterns in the light curves (Villar et al., 2019).

- **Advanced Augmentation:** Utilizing advanced data augmentation techniques, such as synthetic light curve generation via Generative Adversarial Networks (GANs), could help balance the dataset and provide more training samples for rare classes (Rezende et al., 2014). Hybrid Models: Exploring hybrid models that combine RNN-VAE with other algorithms, such as XGBoost or Random Forests, could offer complementary strengths in handling imbalanced datasets and improving decision boundaries.

- **Real-Time Optimization:** Developing a lightweight version of the model, using techniques like pruning or quantization, could reduce computational demands and enable faster inference for real-time applications (Pasquet et al., 2018).

- **Ensemble Variations:**
Investigating ensemble variations like stacking or bagging could improve classification accuracy and robustness, especially for classes with overlapping features. By pursuing these directions, the model can be further refined to enhance its classification accuracy, robustness, and adaptability to the evolving demands of real-time astronomical surveys.

Conclusion

This study presents an effective approach for classifying transient astronomical events, combining a Recurrent Neural Network Variational Autoencoder (RNN-VAE) with a Gradient Boosting Classifier (GBC). The hybrid model achieved strong performance, with an overall accuracy of 89% and an AUC-ROC score of 0.94, surpassing traditional methods in precision and recall, particularly for complex events like Tidal Disruption Events (TDEs) and Calcium-Rich Transients (CaRTs).

The findings highlight the potential of deep learning models to manage imbalanced datasets and noisy, real-time data. Unlike baseline models, which struggled with overlapping light curve features, the RNN-VAE + GBC demonstrated resilience in distinguishing between classes, including ambiguous supernova subclasses. This capability not only improves classification accuracy but also facilitates confident identification of both common and rare phenomena, pushing the boundaries of automated event analysis.

The model's scalability and adaptability make it promising for next-generation astronomical surveys, such as the Vera C. Rubin Observatory's Legacy Survey of Space and Time (LSST). However, challenges remain, such as distinguishing between classes with overlapping characteristics and reducing sensitivity to noisy data. Future work should focus on integrating spectral data, attention mechanisms, or advanced augmentation techniques to enhance accuracy and robustness.

In conclusion, this research represents a significant advancement in automated transient classification. With further refinement, the hybrid model could play a crucial role in processing vast astronomical datasets, improving real-time discovery and understanding of dynamic cosmic events.

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